# FACING THE DIGITAL WORLD

CONNECTING A PERMANENTLY CHANGING INTERNET TO RIGID ORGANISATIONAL STRUCTURES

Wolfgang Ebbers

… Neo, sooner or later
you're going to realize,
just as I did,
there's a difference
between knowing the path
and walking the path.

The Matrix
(The Wachowski Brothers,
1999)

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CONNECTING A PERMANENTLY CHANGING INTERNET
TO RIGID ORGANISATIONAL STRUCTURES

met een samenvatting in het Nederlands

PROEFSCHRIFT

ter verkrijging van
de graad van doctor aan de Universiteit Twente,
op gezag van de rector magnificus,
prof. dr. F.A. van Vught,
volgens besluit van het College voor Promoties
in het openbaar te verdedigen
op woensdag 4 september 2002 te 15:00 uur.

door

Wolfgang Erich Ebbers
Geboren op 3 juni 1969
te Winterswijk

*Promotores*: Prof. dr. J.A.G.M. van Dijk, Faculteit Wijsbegeerte en Maatschappijwetenschappen, Universiteit Twente.

Prof. dr. J. Groebel, European Institute for the Media.

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## Preface

This book you are holding right now is the result of six years work. A very great deal has been accomplished as a private expedition, during spare time and on my own expences. I spent many lunchbreaks, nights, weekends, holidays and savings. Why is that, you ask? I am not quite sure. Was it because I wanted to stand up next to a mountain and chop it down with the edge of my hand? Or was it because I wanted to give something back to the world since that very world is giving so much to me? I don't know. I forgot. I guess it's not important anymore. What's important is that the work is done…

But I'll be back, not to worry }:-)

Don't think that I would have accomplished this journey on my own. Not a chance! I never would have survived this without my father, mother and sister, Ayesha, Bert, Bol, Daphne, Florian, Geraldine, Jan, Jan-Dirk, Janet, Joke, Jos, Liesbeth, Marly, Paul, Peter, Pieter-Bas, de Postkade, Ria, Susan, Sylvester, Theo, and Ton. You gave me the necessary appreciation, courage, understanding, and wisdom to do the things I do and to be who I am. I never would have started this without the help of three very special men: Barend Houtsmuller, Bert Mulder, and Dick Springorum. You were the ones who pointed directions and helped me getting started. And I thank all the Avatars from the Digital World for entertaining me while I was at work, no matter time or place. Keep rolling!

An organisation that hasn't been extinct due to implementing the Internet obviously found its way in dealing with it. Learning about how such an organisation struggled in the interaction with a new environment can be helpful to other organisations that face the same environment called the Digital World. The organisation in which my explorations took place boldly allowed its struggle to be witnessed. For which I am grateful. Therefore, I would like to thank: Jenny Thunnissen-Tommel and Joop van Lunteren for granting me to perform a case study on the Dutch Tax and Customs Administration; my former colleagues of the Editorial Internet Office for their patience. Richard van Breukelen and Rinus Schillemans for making it all possible; Karl Lovink, Tony van den Broek, Agnes Wassink, Nico Nagtzaam, Andrea Nelissen, Hans van Rossum, Mr. Sebregts and Rob Pijpers for not getting annoyed in spite of all my trivial requests for facts and figures. I especially would like to thank Indra Simons, Dingeman Schakel, Harm-Jan van Burg, and Liesbeth Weijs for checking the stuff I wrote.

I would like to thank both Jan van Dijk and Jo Groebel for giving me the necessary inspiration, guidance, and last but not least for taking the risk to be my promotores.

And finally and foremost, I would like to thank Indra. I never could have completed this work without your support, faith, and most of all, love.

Wolfgang Ebbers, September 2002.

## Introduction

It is the year 2002. Yes, we survived the millennium bug. Actually, none of the predicted catastrophes occurred. As a matter of fact, we will probably never be able to prove what happened to us. Was it a giant hoax, or did a giant taskforce lead us into the new millennium? Anyway, as I walk into the dawn of this new era, I have to admit that it looks as if nothing has really changed in the first place. The birds are still singing, children are still playing outside and if I am lucky, my car won't give up on me today and my computer operating system will only crash four instead of six times within the next 24 hours.

Nothing has really changed, huh? Who am I kidding? It seems to me that my natural habitat has changed completely! Why haven't I noticed! It is only five years ago that I logged onto the web for the first time! When I was a child, the only computer-like communication device around was my broken transistor radio which could easily pass for Spock's communicator at the U.S.S. Enterprise NCC 1701! Nowadays, however, we are surrounded by computers and fat server-thin client components. We can go downtown and stick a telephone card into an Internet console at the post office to check our e-mail. We can even use our cellular phones for the same purpose. We communicate, socialise, co-work, learn and even make a profit via the Internet and the technology that surrounds it.
However, as soon as there is a network-crash at the office, our work suddenly comes to a standstill. When virtual learning-spaces lack question-and-feedback features, we are no longer able to get a decent grip on our students' learning results. And the moment the web site of our company crashes, its virtual front office no longer exists, and therefore the company doesn't exist - for a short period of time anyway.

By inventing the Internet we created a Digital World that links individuals and groups such as companies together, no matter time or place. We not only created a new reality, but we changed the old reality as well. Almost no physical barrier, no national law or monetary system, no cultural set of values nor organisational rule or convention prohibits us from contacting a possible customer, competitor or fellow human being anywhere on this planet.

However, it seems that the Digital World is now turning its back on us. Old paradigms such as the unity of time, space and action seem to have lost their value. The dependency of daily life on computers is growing rapidly, both in private and in public life, and during spare time as well as working hours. As a result, managing organisations and society will probably become harder in the near future, since a considerable part of them only exists in cyberspace.

After the introduction of the World Wide Web in 1991, a huge number of organisations embraced the Internet. They designed their first homepages and presented them to the world. Often, these homepages were one-on-one translations of the organisations' brochures. As time went by, the presentations became increasingly comprehensive and technically interactive. Gradually, they evolved into complete virtual front offices. Nowadays, organisations can be contacted via e-mail or online chat, and goods can be ordered, paid, and - in the case of software - distributed at the

same time. Virtual real front offices were introduced and separated from the organisations themselves (leaving behind so-called back offices). These virtual front offices enabled organisations to interact with this new, intangible digital environment using Internet communication media that supply the organisation with new channels. But what does this mean to an organisation? Is it possible that 'getting onto the Net' will force an organisation, suddenly and unexpectedly, to change its structure? If so, then how will this happen? It is this question that I intend to answer in my dissertation. By finding out what impact the Internet has on organisations.

When I began this dissertation, I expected that ‘Internet communication’ itself - as some sort of independent variable - would automatically lead to revolutionary changes in communication processes and therefore to structural change within an organisation.

I started collecting data using the former expectation as a temporary, theoretical point of departure. I chose a case study as a research design and participant observation as a research method. During the data-collection I used theories from three disciplines in order to label the qualitative data I found at the Dutch Tax and Customs Administration:
- organisational management - *process contingencies*.
- organisational communication - *communication structures*.
- marketing - *relation marketing*.

In other words, during the data-collection period a temporary research aim, temporary hypotheses and temporary central research questions were used as landmarks to somewhat direct the inquiries. While collecting data the initial expectation was fine-tuned and put forward as follows:

People group. Groups have certain structures. Group structures are supported by communication structures. Within these communication structures, communication processes take place. People participate in communication processes by sending, receiving, and interpreting messages using paralanguage that accompanies the content of the messages. Internet communication media have many absent, completely new or still unknown forms of paralanguage. Thus, the introduction of Internet communication media increases the chance of a change in the processes of sending, receiving, and interpreting messages. Changes within communication processes may lead to a change in the communication structures. Changed communication structures most of the time cause changes in group structures. Changed group structures may cause changes in other group structures – for example complete organisations - and finally society.

In April 1998 I finished the participant observation research period. Until August 1998 I fine-tuned the collected data derived via this method. The period from September 1998 to June 1999 was used to 'absorb' the fine-tuned data in my mind, while I kept collecting data via interviews and by retrieving documents.

The length of the 'absorption' period is explicable. Because no matter how hard I tried, the collected data just wouldn't support the temporary expectations. ‘Internet communication’ simply couldn't be regarded as the one-and-only cause of triggering a change in communication processes and thus triggering structural changes within the Dutch Tax and Customs Administration. The conclusion based on the data-collection forced me to alter the hypotheses, which implicitly indicated that 'something was wrong'

with the expectations. There was no revolutionary change at the Dutch Tax and Customs Administration.

Or was there something wrong with the way I looked at the big picture? I bore this possibility in mind all the time. Because, at the start of this research there weren't any overall and operational research methods available which could be used to analyse the subject. Apart from a few visions and prophecies that had been put forward on the 'new economy' and networked, virtual or boundary-less organisations, there were only fragments to be found within for example the fields of organisational behaviour, communication science and marketing.

As a result, I needed to take another look at the big picture. Because I wasn't sure what I 'saw' as I looked at the data. And as long as I wasn't sure, I didn't know where to start drawing conclusions. For that reason I decided to change the way I looked at it. I designed a meta-theoretical level using what Maturana and Varela had found. After I adapted their findings and transformed them together with theories of Hill, Fehlbaum and Ulrich into a new theoretical background, I slowly started to understand the data I had collected. It suddenly became clear to me that it was the phenomenon of *interaction* itself that leads to structural changes, rather than the introduction of a new means of communication, such as electronic mail. Having gained this insight, I redesigned the theoretical framework, which gave rise to a final body of fundamental statements, hypotheses and research questions. Subsequently, I analysed the data again and drew a final set of conclusions.

The dissertation finally resulted in putting the new set of cohering fractions onto paper by formulating the theoretical framework - *chapter 1*. The method to find data in order to test the theoretical framework is described in *chapter 2*. Obviously, the results contain a summary of the data collected at the Dutch Tax and Customs Administration - *chapter 3*. The conclusions show how the summary of the collected data relates to the research's theoretical framework. First of all by answering the research questions derived from the hypotheses. Secondly, by relating the data to the fundamental statements. Thirdly, a set of categories is put forward and further research topics are proposed - *chapter 4*. And finally three discussions will be presented. First, how the Administration should face the Digital World. Second, whether or not the conceptualisations of communication as handled within this dissertation can be applied in the broader field of communication sciences. Third, how the theoretical framework and the conclusion can be applied to organisations that face the Digital World - *chapter 5*.

## Summary

During the mid- and late nineties it was widely expected that the Internet boom would inevitably lead to a global shake-up. The Internet would give organisations of the so-called Old Economy a very hard time, especially rigid organisations such as bureaucracies. Given the large number of organisations of this type, for instance in governments, it became relevant to explore how they handle the Internet. This research focuses on the approach of one of these government organisations: the Dutch Tax and Customs Administration.

***The research aim***
This paragraph captures the research aim[1]. The phenomenon of Interaction plays a crucial role in this research. Interaction captures the multitude of influences that an organised system exchanges with its environment. These mutual influences act as perturbations that may trigger changes, both in the structure of the organised system itself and in its environment. However, the structure of an organisation conditions the course of its interactions and it restricts the structural changes that the interactions, which can either be adaptive or disruptive[2], may trigger. Once the organised system and the environment have started to adapt to each other, they create a so-called *structural coupling*. In the case of people, which are also organised systems, communication plays a very important role in interaction. By communicating, they create and maintain the structural coupling with the human beings around them. People often use speech as a means of communication, but they can also use a computer with an Internet connection to get in touch with someone else.

People - who can also be regarded as organised systems - interact with their environment too. Within the interaction they communicate, which means that they exchange messages with their environment while applying channels. These messages have informational and relational aspects. By communicating, people can develop and maintain structural couplings - or better: relationships - with each other. If they do this, they form groups. Groups on their turn communicate with their environment, for instance with other groups. They may communicate while being in the same space at the same time using speech as a means of communication. However, they can also be in different spaces and use a telephone. Or they may be in different spaces, at different times and use paper and ink. But what happens if they use computers that connect them to the Internet in order to get in touch with each other? Because using the latter not only implies that there are new ways to communicate, and thus new informational and relational aspects. But it also implies that they interact with a new environment. What does this mean with regard to the structure of organised groups of people?

These are relevant questions, because after the introduction of the World

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1 Exploring what influences an Internet-related virtual front office has, both on an organisation's structure and on its internal communication structure - see also end of this paragraph

2 Due to their organisational structure, mammals cannot breath under water. If they do, they die.

Wide Web technology in 1991, a huge number of organisations embraced the Internet. They designed their first homepages and presented them to the Digital World. Often these homepages were one-on-one translations of the organisations' brochures into html documents. As time went by, the presentations became both increasingly comprehensive and technically interactive. Gradually, the presentations evolved into complete virtual front offices. Nowadays, organisations can be contacted via e-mail or online chat and goods can be ordered, paid, and - in the case of software - distributed at the same time. Front offices were introduced and separated from the organisations themselves (leaving behind so-called back offices). Within and via these virtual front offices, which connect organisations with the Digital World, four types of services are hosted that originate from the back offices: information services, communication services, transaction services and distribution services.

The Digital World, a virtual real world created by the Internet network and the Internet communication media, can be divided into four intangible Virtual Spaces. Namely, a Virtual Information Space, a Virtual Communication Space, a Virtual Transaction Space and a Virtual Distribution Space. The four Virtual Spaces are subject to constant change because of three different types of contributions to the Digital World:
- technological changes, such as secure data interchange
- changes in utilisation, such as consumer empowerment
- changes of users, such as increasing numbers.

A virtual front office provides an organisation with a channel to the permanently changing Digital World. But will this channel bring perturbations which change the structure of an organisation? - a response that is common to all regular organised systems. And will these changes be either adaptive or disruptive? The first part of the research aim revolves around these questions, and can be worded as follows: “Exploring what influences an Internet-related virtual front office has on an organisation's structure”.

However, communication not only provides the structural coupling with the environment, it also plays an essential role in the structure of the organisation itself, as the members of an organisation interact with each other too. This implies that changes in the organisational structure can cause the internal communication structure to change as well. Apart from that, it can also be the other way round: changes in the internal communication structure can change an organisational structure too. Therefore, it is not only necessary to look at the impact of a virtual front office on the organisational structure. But it is also necessary to find out what impact a virtual front office has on the internal communication structure. Bearing the above in mind, the second part of the research aim can be deduced as follows: “Exploring what influences an Internet-related virtual front office has on an internal communication structure.”

Combining the two parts, the research aim can be worded as follows: *“Exploring what influences an Internet-related virtual front office has, both on an organisation's structure and on its internal communication structure.”*

***Theory***

The strategic apex - the people who are charged with the overall responsibility for the organisation, i.e. the top-level management plus those organisational members who provide direct support to the top-level

managers, such as representatives - is concerned with ensuring that the organisation carries out its mission effectively. At the same time, it is up to the strategic apex to observe, and adapt the organisation to, new boundary conditions. Consequently, as soon as large parts of the regular environment start to turn to the Digital World, the organisation has to turn to the Digital World too; otherwise it would lose access to its environment and therefore lose the opportunity of obtaining something from, or offering something to it[3]

As mentioned before, organisations create a channel to the Digital World by implementing a virtual front office. Once this channel is used for recurrent interactions that lead to mutual changes on both ends, a structural coupling has been created. After a structural coupling has been created, a virtual front office has to adapt to the changes in one or more of the four Virtual Spaces of the Digital World it is connected to. When this process of adaptation comes to a halt - i.e. when the adaptability of the virtual front office decreases or disappears altogether - then the structural coupling will eventually be lost. When that happens, the organisation is no longer able to adopt the contributions (technology, utilisation, and users) that are introduced into the Digital World. In other words, when an organisation's virtual front offices become less adaptable, it will gradually lose access to the opportunities that the Digital World provides.

The adaptability of a virtual front office can be determined by means of a number of parameters. Particularly critical factors are whether or not it:
- has difficulties in adopting new contributions to those Virtual Spaces of the Digital World with which it has already established a structural coupling.
- increasingly focuses on controlling the interactions with the Digital World that flow from: A) contributions that have already been adopted from the Digital World, or B) contributions introduced into the Digital World by the organisation itself.
- can adopt new contributions to the Digital World at all.

As mentioned before, the structure of an organisation conditions the course of its interactions with the environment. Therefore, the organisational structure - i.e. the sum of the ways in which labour is divided into distinct tasks and the way in which co-ordination between these tasks is achieved - conditions the adaptability of a virtual front office. The organisational structure is supported by an internal communication structure. The internal communication structure covers the network of messages that flow along the formal relationship network of an organisation. The internal communication structure itself does not support the virtual front office. Consequently, the internal communication structure does not condition the adaptability of a virtual front office.

To find out to what extent the organisational structure conditions the adaptability of a virtual front office, the organisational type has to be taken into consideration. It is possible to distinguish two extreme organisational

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3 For instance, if groups of taxpayers (for instance both innovators and early adopters, which constitute up to 16 per cent of a total population - Rogers, 1983) start to turn to the virtual information space to collect information, then a tax administration can reach that group most effectively by offering information via that particular space. For instance, by informing those groups through the Internet of massive changes in tax legislation.

constellations, or ideal types**,** on the opposite ends of a sliding scale[4]. Type A has a high potential for routines and a low potential for problem solving. Type B has a low potential for routines and a high potential for problem solving. Type A aims at high rate *first-order productivity*. First-order productivity focuses on constant processes. Type B aims at high rate *second-order productivity*. Second-order productivity focuses on processes of permanent or mutating change. At the same time, type A aims at what is referred to as *high safety levels*. And type B at what is referred to as *high levels of independence*. Safety levels refer to the level of shielding organisational participants from uncertainty and unexpected environmental reactions. Levels of independence refer to the extent to which organisational participants can decide on how to perform their labour without being exposed to over-taxation that leads to uncertainty or fear.

Organisations use variables that, in conjunction, characterize an organisation's structure. Organisations that apply variables that tend to type B will show a higher degree of flexibility than those that apply variables that tend to type A, as type B is designed to anticipate permanent evolutionary or mutating change. Organisations that apply variables that tend to type A are not designed for that purpose. They focus on constant organisational processes. Consequently, a organisational structure that tends to type A is rigid. The variables that determine the organisational type are captured in the following table:

| **Type A Variable level** | **Instrument** | **Type B Variable level** |
|---|---|---|
| Low | Decentralisation | High |
| Low | Functionalisation | High |
| Low | Delegation | High |
| Low | Participation | High |
| High | Standardisation | Low |
| High | Separation | Low |

The question - to what extent does the organisational structure condition the flexibility of a virtual front office? - can now be answered. The more the structural coupling(s) provided by the virtual front office is connected to the organisational structure by applying variables that tend to type A, the less adaptable a virtual front office will become.

The degree to which an organisation applies variables that tend to type A not only affects the adaptability of its virtual front office. It also affects the extent to which an organisation will choose to connect to the particular Virtual Space that covers its core business the most. To understand why, the productivity of an organisation has to be taken into consideration.

The *productivity* of an organisation is referred to as: The *relation* between
A the *performances delivered* to the environment on one hand *and*,
B on the other hand, *realising these performances* by both:
  I the abstraction of resources from the environment
  II and performances of the organisational units.

So, if the environment changes, then the *conditions to deliver* to the environment will change too, as will the *conditions to abstract resources* from the environment. If these conditions change, then the *conditions of the*

4 Hill, Fehlbaum en Ulrich, 1994.

*organisational units to perform* will have to change too. Otherwise the organisation would become less productive.

If large parts of the organisational units are connected to an environment that changes continuously, then a large part of the organisation is forced to constantly adapt to those changes. Because the organisation cannot afford to lose a major and vast connection to the environment it heavily depends upon. If the organisation fails to adapt, then it will run the risk of losing the opportunity both to both deliver to that environment and to abstract resources from it. In that case, it will lose its productivity. When an organisation loses its productivity, it loses its rationale to exist.

Consequently, organisations that apply type A variables to support their virtual front office are in all probability hesitant to create a full structural coupling with that particular Virtual Space of the Digital World that covers its core business the most. Because variables that tend to type A are not designed for anticipating the constant evolutionary or mutating changes that occur in the Digital World.

For a graphical overview of the theory that has been described see chapter 1.2.4.

***Method***

Empirical research in a particular organisation has to give answers to the following research questions:

1 *Does the organisation's strategic apex decide to create a channel to the Digital World because it wants to carry out the organisation's mission as effectively as possible? If so, does the organisation's strategic apex do this as soon as it observes that the organisation's regular environment is turning to the Digital World?*

2 *Is the organisation able to create a structural coupling with the Digital World by implementing a virtual front office?*

3 *Does the organisation, in order to maintain its structural coupling with the Digital World, aim to adapt its virtual front office? If so, does the organisation do this as soon as it observes that one or more of the four Virtual Spaces that it is connected to start to change?*

4 *Does the organisation more and more connect the structural coupling(s) provided by its virtual front office to its organisational structure by applying variables that tend to type A? If so, does its virtual front office become less adaptable?*

5 *Does the organisation connect the structural coupling(s) provided by its virtual front office to its organisational structure by applying variables that tend to type A? If so, is the organisation hesitant to create a full structural coupling with that particular Virtual Space of the Digital World that covers the domain of its core business the most?*

6 *Does the organisational structure and its internal communication structure change when its virtual front office provides communication services?*

7 *Does the organisation connect the structural coupling(s) provided by its virtual front office to its organisational structure by applying variables that tend to type A? If so, does the virtual front office provide a structural coupling with the Virtual Communication Space? If so, does the virtual front office increasingly focus on controlling communication flows with the Virtual Communication Space?*

The empirical research can be accounted for as both A) explorative and B) hypothesis developing, and C) qualitative:

A explorative in the first stage of the research; in 1997, it was a relatively new quest, organisations faced a new phenomenon; Internet use started to boom after the mid nineties[5].

B hypotheses developing in the second stage of the research; After the first analysis of the collected data the only conclusion that could be drawn was that the virtual front office exerted little influence on the organisational structure and its supporting communication structure, since these structures had only been subject to small changes. The initial expectation, that 'Internet communication' itself - as some sort of independent variable - would automatically lead to revolutionary changes in communication processes and therefore to structural change within an organisation, was not fulfilled. This conclusion became a trigger that changed the type of research, as it added a new challenge, i.e. finding a potential causal relation, to the original explorative dimension captured in the aim of this research. In other words, after the data showed hardly any influence, the (second stage of the) research focused on studying the collected data for a potential causal relationship between a rigid organisational structure (type A) and a decreased adaptability of a virtual front office in order to develop new hypotheses for future research.

C Qualitative, the research concerned a case study of an organisation with relatively few organisational units.

The location in the organisation from which this case study was performed was the so-called Editorial Internet Office (EIO) of the Dutch Tax and Customs Administration (Belastingdienst), from now on referred to as the Administration, in the period running from 1997 until the beginning of 2000. The EIO was responsible for operating www.belastingdienst.nl and handling e-mail.

Although the research design was based on a single case study, sampling was nevertheless inevitable, given the size of this case - i.e. the Administration:

- Every organisational department that was either formally or both formally and directly (i.e. those departments that performed the actual activities) involved in the operation or the implementation of one or more of the services of www.belastingdienst.nl or …@belastingdienst.nl had to be made explicit. Therefore, a selective, non-random method was

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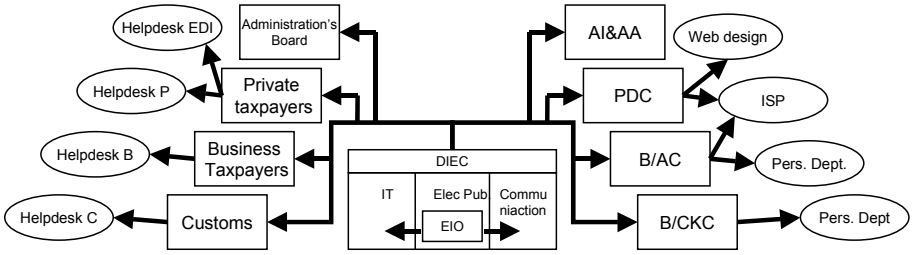
5 In the US in 1995 the early adopters embraced the Internet. In April 1997 the early majority phase began. Halfway 2000, the late majority phase began. In the Netherlands, the early adopters' phase lasted until the beginning of 1999. Moreover, on a global scale, at the beginning of 1998 global internet use was still in the innovator phase, in 2002 the global Internet use is - still - in the early majority phase.

required. This was achieved by applying the so-called 'snowball sampling' method. In this sampling method the sampling unit was an *organisational department*. The application of this specific method had to ensure that any department that was not formally involved in the operation or the implementation of one or more of the virtual front office services of www.belastingdienst.nl or …@belastingdienst.nl was deliberately left out of the sample.

The following picture shows the trajectory of the sample, which results in an overview of 20 departments that were either formally (10) or both formally and directly (10) involved in the operation or the implementation of one or more of the virtual front office services of www.belastingdienst.nl or …@belastingdienst.nl.




EDI - electronic data interchange
P - private taxpayers
B - business taxpayers
C - customs
AI&AA - Artificial Intelligence & Administrative Automation
PDC - Parliamentary Documentation Centre
B/AC - the Administration's centre for information and communication technology
B/CKC - the Administration's publisher and educational centre.
DIEC - the Administration's publisher project organisation for documentary information and electronic communication
B/CKC - Pers. Dept. - WsenL, the Administration's department that takes care of, among others, applications.

| **Formally** | **Both formally and direct** |
|---|---|
| Administration's Board | |
| | AI en AA |
| Private Taxpayers Division | Helpdesk P |
| | Helpdesk EDI |
| Business Taxpayers Division | Helpdesk B |
| Customs Division | Helpdesk C |
| PDC | ISP |
| | Web Design |
| IT – DIEC | |
| Electronic Publishing – DIEC | EIO |
| Communications – DIEC | |
| B/AC | Pers. Dept B/AC |
| B/CKC | Pers. Dept B/CKC |

- Time sampling: The second stage had to serve the observation of any changes over time in the organisational and internal communication structure and www.belastingdienst.nl and …@belastingdienst.nl. The snowball sample already explicated that there were 10 organisational departments that were both formally and directly involved in www.belastingdienst.nl and …@belastingdienst.nl. It was impossible to permanently monitor every single one of these organisational departments. This could only be done in case of the Editorial Internet Office, namely by participant observation (see chapter 2.6.2.). With

regard to the other 9 organisational departments, a second selective, non-random sampling method had to be deployed, namely *time sampling*. In this sample the sampling unit was a period of time, namely a three-month-period. The sample was carried out for a period of two years; 1998 and 1999, i.e. there were 8 samples. Every sample implied conducting half-structured interviews. (see chapter 2.6.3.). The other, merely formally related departments were left out of the second stage sample since the departments that were both formally and direct related were all sub departments of the merely formally related departments. Any changes in the sub departments with regard to the virtual front office would also concern the merely formally related departments, and vice versa. Except for AI & AA, which was treated as a sub department and therefore included in the time sample.

With regard to the changes within www.belastingdienst.nl and …@belastingdienst.nl the sampling unit was also period of time, namely a six-month-period. This time sample was carried out for a period of two years; from 1998 to 1999, i.e. there were 4 samples. An extra, final, single sample was taken in 2002 in order to check if there were any changes right before this dissertation was closed - see chapter 4.1, answering research question 4B.

The data collection methods concerned:

- Participant observation: The participant observation period lasted from the beginning of 1997 until halfway 1998. The observation can be characterized as 'observer as participant'. The research location granted the opportunity to perform several roles five days a week during a year and a half, namely as one of the:
  - the project leaders within the EIO.
  - technical advisers.
  - EIO members who had to document all web site related activities and technologies
  - EIO members who handled web site related e-mails.
- Open Interviews: Two different kinds of open interviews were conducted throughout the research period, namely free-attitude and half-structured interviews. The interviews were conducted from 1997 until halfway 1999. The free-attitude interviews were conducted with all team members of the EIO, and with all team leaders and several members of the units presented in the single sample. The half structured interviews were conducted with key persons that had a formal and top-down relationship to the EIO:
  - the general manager of the Administrations
  - head of communications of the Administration
  - account manager at PDC
  - general project manager at DIEC
- Collecting documents: Four types of documents were collected from the beginning of 1997 until 2000.
  - white papers
  - green papers
  - reports
  - archives.

***Results***

The collected data were used to test the theoretical framework (section 1.2). The hypotheses that were drawn from the theoretical framework could all be

accounted for in the case of the Administration:

In an effort to carry out its mission as effectively as possible the Administration's strategic apex decided to create a channel to the Digital World. It decided to do this as soon as it observed that its regular organisational environment started to turn to the Digital World, namely in 1995. In the same year, the Administration implemented a virtual front office.

Once the Administration on one hand and the Virtual Information Space and the Virtual Communication Space on the other hand had started to adapt to each other, a structural coupling was created with these Virtual Spaces. In order to maintain this structural coupling the Administration made an effort to adapt its virtual front office every time the Virtual Information Space and the Virtual Communication Space started to change.

However, the Administration more and more connected the structural couplings provided by its virtual front office to the organisational structure by applying variables that tend to type A.

At the same time the Administration's virtual front office became less adaptable. Moreover, the Administration hesitated to create a full structural coupling with the particular Virtual Space of the Digital World that covers the domain of its core business the most, i.e. the Virtual Transaction Space.

Next to that, the Administration's organisational structure (by adding activities to organisational units) and its internal communication structure (by initiating meeting between departments) changed as the virtual front office began to provide communication services. Moreover, the Administration's virtual front office started to focus on controlling communication flows once the virtual front office had provided a structural coupling with the Virtual Communication Space.

For a graphical overview of the results see chapter 2.4.

***Conclusion***

This research has pointed out that the phenomenon of *interaction* itself, rather than adopting Internet communication media by implementing a virtual front office, is the driving force of structural change in organisations. When interacting, it depends on the adaptability of the organisational structure whether or not an organisation is able to adapt to the permanently changing Digital World.

This research also pointed out that when interacting with a rigid organisation the Digital World somehow is affected too. Namely by a virtual front office that increasingly focuses on controlling the interactions with the Digital World. It is the degree in which the organisational structure supports the structural couplings with the Digital World that determines how strong the triggers are that will force both organisation and environment to change their structure.

Next to that, the theory that has been developed and tested in this research suggests that a virtual front office has to keep pace with the changes in one or more of the four Virtual Spaces of the Digital world it is connected to. When a virtual front office is no longer able to keep pace, it has become

less adaptable. In that case it may well lose the structural coupling with the Digital World. When this happens, the organisation no longer adopts the contributions that are introduced into the Digital World; i.e. it will lose access to the opportunities that the Digital World renders.

So, if an organisation chooses to connect to one or more Virtual Spaces of the Digital World, then the organisation should apply variables that tend to type B in order to support the structural coupling(s) provided by the virtual front office, instead of variables that tend to type A. Especially when connecting the core business.

To determine whether or not the type B variable level is high enough, an organisation has to answer a simple question: "*Can our virtual front office keep pace with the relevant, sudden and extreme changes that occur in the Virtual Spaces it connects to?*" If not, the theory developed in this dissertation suggests that the type B variable level should be increased.

***Reccommendation***

As for the Administration, to prevent that its virtual front office gradually becomes less adaptable, it is reccommended to increase the type B variable level with regard to its virtual front office. Both now and in the future. However, the Administration as a whole should not turn into an extreme type B organisation. It aspires to enforce legal security and equal justice in all its actions. As such, it has to focus on constant processes. Therefore, the Administration needs to be an organisation that tends to type A. Following this line of argument, all government institutions that aspire 'to enforce legal security and equal justice in all its actions' should refrain from turning into extreme type B organisations.

Increasing the type B variable for the sake of a flexible virtual front office only, without endangering its type A organisation as a whole, can be established as follows:

- High level decentralisation; hosting the services by the existing organisational units insufficiently supports the adaptability of the virtual front office. Instead, a single organisational unit needs to be created that is completely dedicated to operating the virtual front office. The organisational unit is to cover the operation of information services, communication services, transaction services and distribution services, both functionally and technically.
- Low level separation; the dedicated unit is not only to cover operational tasks, but also tasks related to design and implementation of the virtual front office services.
- High level functionalisation; the teams within the organisational unit should operate in an organisation that lacks a clear single line of command, for instance a matrix organisation with lines of command grouped alongside the four virtual front office services and lines of command grouped alongside innovation, implementation and operations.
- High level delegation and participation: the teams within the organisational unit need a short chain of command. The teams should have wide margins to give shape to their own task completion.
- Low level standardisation: contributions to the Digital World are often unpredictable and complex. Adopting such contributions may well asks for improvising and for 'bending of rules'. Low level standardisation has to assure that there is enough room for improvisation and flexibility.

# 1. Theoretical Framework

## 1.1. Theoretical background

The Internet was conceived in the late 1960's by building the ARPAnet[6]. It would eventually become a worldwide accessible network facility referred to as the Internet. The Internet became a substitute for traditional communication media such as television, telephone and fax. With the introduction of payment systems and secure network technology enterprises more and more used the Internet infrastructure to deal with existing or redesigned processes. But the Internet is much wider than that. Via the Internet people and organisation interact with each other using computers. They more or less create virtual real identities, communities and organisations without ever entering this 'world' on a physical level.

The network itself as well as the various Internet communication media (see 1.1.3) seem to have turned the Internet into a Digital World with outlines similar to our real, organic world. It is possible to pay with money from the real world as well as with cyber cash. It is even possible to become a victim of cyber crime. Like the organic world, the Digital World provides spaces where people can meet each other, join groups, gather information, order, pay for and obtain (digital) goods and build communities.

In his ICDT-model Anghern (1997) proposes four categories of Virtual Spaces created by the Internet that give economic agents - i.e. individual citizens as well as companies - alternative channels for exchanging information, communicating, distributing different types of products and services, and conducting formal business transactions. Namely, a Virtual Information Space, a Virtual Communication Space, a Virtual Distribution Space and a Virtual Transaction Space. Anghern treats these spaces separately because he believes that they correspond to different strategic objectives, and that they require different types of investment and organisational adjustments. Anghern describes the spaces as follows:

The Virtual Information Space (VIS) is about visibility. It operates like a large billboard. It shows who's who, what's available, how much it costs and so on. It may offer flexible access, which allows visitors to 'choose their own path' but it remains a one-way communication channel.

The Virtual Communication Space (VCS) is about interaction. Like a café, it is provides a 'space' for engaging in relationship building, and exchanging ideas or opinions. The 'space' itself can range from a simple chat-line to a sophisticated 3D space in which individuals 'meet'. Members of the virtual community can communicate at high speed, low cost, and bypass traditional physical and geographical constraints.

The Virtual Distribution Space (VDS) is about service delivery. As with the postal service, there are constraints on the types of items that can be delivered through this channel - it is only suitable for products and services

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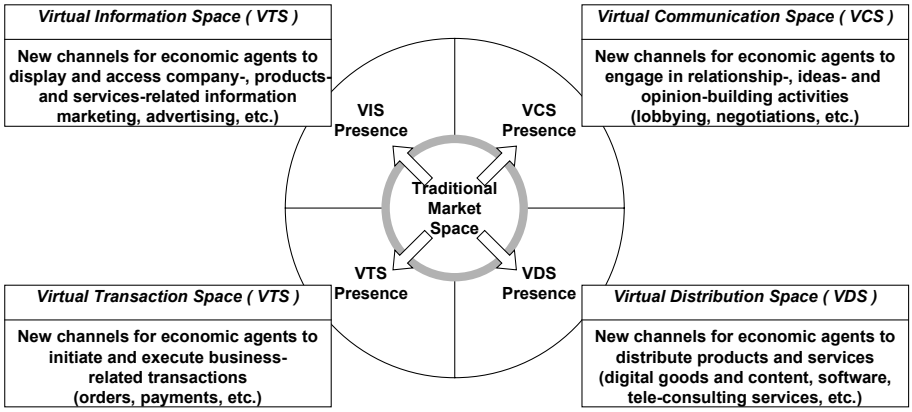
6 Advanced Research Project Agency Network

that can be wholly or partly digitalised. Also, the recipient takes ‘something’ away, but the payment itself happens elsewhere.

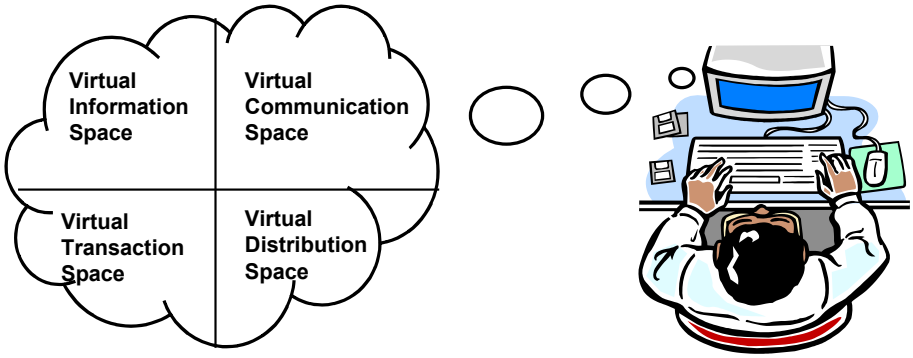
The Virtual Transaction Space (VTS) is about trading. It is a bit like a stock exchange in that goods and services are not transferred in this space - only orders, commitments, invoices or transfers of payment.




In the ICDT model the market place is the centrepiece community. An example is www.ebay.com, a community made up of individual buyers and sellers who, according to eBay, come to the site to do more than just buy or sell: they have fun, shop around, and get to know each other, for example by chatting at the eBay Café. Through the bulletin boards, users can meet and get to know each other, discuss topics of mutual interest, and exchange information. According to eBay, the community is self-policing and users frequently form ‘neighbourhood watch’ groups to help guard against misuse or violations of ‘site etiquette’.

However, the ICDT model is not only applicable on business-driven communities, but also on all kinds of other communities that are related to the Digital World - see chapter 1.1.3. Therefore, in this dissertation the ICDT model is used for defining the Digital World.

The Digital World is an intangible, virtual real world created by the Internet network and the Internet communication media. The Digital World can be divided into a Virtual Information Space, a Virtual Communication Space, a Virtual Distribution Space and a Virtual Transaction Space. Individual users and groups access one or more of these four Virtual Spaces of the Digital World by using computers.




All four spaces are continuously changing. The number of people taking part in this Digital World is growing fast. Data collected in the Domain Survey by the Internet Software Consortium (ISC) give an interesting impression. The ISC periodically counts the number of IP addresses that have been assigned a name[7] 1). In July 1996 the ISC estimated the number at 12,881,000. By July 2000 this number had grown to approximately 93,047,785. The January 2001 count showed approximately 109,574,429 IP addresses. The January 2002 count showed approximately 147,344,723 IP addresses.

As for the World Wide Web, in October 2000 the Google search machine counted for instance 1,247,340,000 web pages. In March 2002 the number was 2,073,418,204 web pages.

However, the changes aren't caused by the growth of the number of users alone. New technology, which fosters new concepts, plays an important role as well. Examples of new technology are XML, Streaming Video, Dynamic Servers, wireless networks, Blue Tooth, etc. Examples of new concepts are integrated web services, access to governmental and commercial personal information, personalised web interfaces, pervasive computing, ubiquitous networks, etc.

To understand how the Digital World affects us, it is necessary to be aware of the phenomenon of interaction. The term Interaction captures the multitude of influences that an organised system exchanges with its environment. These mutual influences act as perturbations that may trigger changes, both in the structure of the organised system itself and in its environment. These changes can either be adaptive or disruptive.

Communication plays a very important role in interaction. It creates and maintains a so-called structural coupling between an organised system and its environment. Communication does this by providing the relational aspect within systems, and between systems and their environment with messages, channels, or media.

When interacting via the Internet an organised system not only starts to interact with a new environment, it also starts interacting while using a new

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7 An IP-address can be attached to for example an e-mail address or a location on the World Wide Web. The ISC considers the numbers presented in the domain survey to be fairly good estimates of the minimum size of the Internet. Although they cannot tell if there are hosts or domains they could not locate.

means of communication. The combination of a new environment with the use of a new means of communication must, at some level, have impact on the organised system.

This chapter intends to explain how and why organised systems interact, how communication is related to interacting systems and what possible impact interaction via the Internet may have on both communication and organised systems:
- Organisation (1.1.1.);
- Communication (1.1.2.);
- Interacting via the Internet (1.1.3.);

Subsequently, the theoretical basis will be rounded off with the fundamental statements, as well as the derived research aim (1.1.4.).

### 1.1.1. Organisation

The Digital World is already having its impact on society. People can find information much faster. People communicate with one another all over the world including their aunts in Australia. They can penetrate international markets more easily. But the Digital World also gave them cyber crime (the European Council, 2000), harmful content (ICRA, 1999) and fatal computer viruses that destroy years of work. There is an omnipresent risk of catching repetitive strain injuries and backaches. And it increases the differences between the rich and the poor on a global scale by introducing a new gap: the information gap (Kagan, 1998).

These are all perfectly new examples of the way living beings and their environments have a mutual influence on each other. Not that the older examples are less colourful. Our greed for expensive furniture and easily maintainable building materials that allow us to stay lazy bastards - painting garden furniture is a hell of a job - still destroys our rainforests. This causes erosion, which leads to floods, which result in heavy casualties.

Humberto R. Maturana and Fransisco J. Varela (1998) describe the impact of living beings on their environment (or medium, as they sometimes call it), and vice versa. The idea of *organisation and structure* plays a very important role in their theories. In their view, 'organisation' denotes those relations that must exist among the components of a system for it to be a member of a specific class. 'Structure' denotes the components and relations that actually constitute a particular unit and make its organisation real. Thus structures can be modified (for example, replacing them by other materials) without changing the organisation.

They refer to living systems on two levels: a cellular and a meta-cellular level, or *first-order* and *second-order* units. Both units are defined as continually self-producing organisations - they call this autopoiesis - with a special network of (chemical) transformations. This network has certain endings that border on the outside world. The endings are called membranes - for example a cell membrane or (meta-cellular) an eye or an eardrum. These membranes are used for interpreting signals from the outside world, and allow the unit to adapt to this outside world when interacting with it. This is an essential feature. For, if a living systems stops adapting, its structure may eventually suffer a breakdown, and with it the living system itself.

For economic organisations, an environment could be the Digital World. Organisations that don't have an Internet computer won't take notice of the Digital World, nor will the Digital World take notice of them. On the other hand, organisations that do have an Internet computer also have the membrane to 'see' the Digital World. At the same time, the Digital World is able to 'see' them, because these organisations posses the necessary component within their organisational structure to somehow interact with the Digital World. The Internet computer acts like a sort of membrane.

Among all possible interactions between systems, there are some that are particularly recurrent or repetitive. For instance, if we look at the membrane of a cell on a first-order level, we note that there is a constant active transport of certain ions (such as sodium or calcium) through that cell, in such a way that in the presence of those ions the cell reacts by embodying them in a metabolic network. This active ionic transport occurs regularly. The structural coupling of the cells with their medium or environment enables these cells to interact recurrently with the ions that they contain. Besides, the cellular structural coupling only allows interactions with specific ions. If other ions (cesium or lithium, for instance) are introduced into the medium, the structural changes that these ions would unleash in the cell will interrupt its autopoiesis and end its existence.

The structural coupling with the medium as a condition of existence covers all possible cellular interactions. This includes interactions with other cells as well. The cells of multi-cellular systems normally exist only by taking other cells in close cellular proximity as a medium for realising their autopoiesis. In the closeness of their structural coupling, cells fuse together forming a meta-cellular level unit. These meta-cellular or second-order units will have a structural coupling and ontogeny too, adequate to its structure as a composite unit.

Each living being begins with an initial structure. This structure conditions the course of its interactions and it restricts the structural changes that the interactions may trigger. At the same time a living being is born in a particular space, in a medium that constitutes the ambience in which it emerges and in which it interacts. This ambience appears to have its own structural dynamics, operationally distinct from the living being. Between the two exists a necessary structural congruence (or the unit disappears).

Maturana and Varela conclude that in the interactions between the living being and the environment within this structural congruence, the perturbations of the environment do not determine what happens to the living being; rather, it is the structure of the living being that determines what occurs in it. This interaction is not instructive, for it does not determine what its effects are going to be. Therefore, they use the expression 'to trigger' an effect. In this way they refer to the fact that the changes that result from the interaction between a living being and its environment are *brought about* by the disturbing agent, but *determined* by the structure of the disturbed system. The same holds true for the environments.

So no matter how tall the tree is a child may jump out of, the impact on the ground won't turn it into a robin. And no matter how sharp an axe is, its density won't let a man cut water with it.

Maturana and Varela explain the phenomenon of structural determination by introducing the concept of *breakdown*. They claim that we can only deal with systems when all their changes are determined by their structure and when those structural changes are a result of *their own dynamics* or *triggered by their interactions*. A car, a computer, or a sewing machine are all treated as though they were determined by their structure. Otherwise, how could we explain that when we find a breakdown we try to change the structure and not something else? When we press the accelerator of our car, and the car doesn't move, it will never occur to us that something is wrong with our pressing foot. It is probably something in the connection between the pedal and the injection system, which is in the structure of the car. [1)]

Using the concept of breakdown, they distinguishing four domains that specifies the structure of a unit:

- Domain of changes of state: all those structural changes that a unit can undergo without a change in its organisation: i.e., with conservation of class identity.
- Domain of destructive changes: all those structural changes that a unit can undergo with loss of organisation and therefore with loss of class identity.
- Domain of perturbations: all those interactions that trigger changes of state.
- Domain of destructive interactions: all those perturbations that result in a destructive change.

As long as the unit doesn't enter into a destructive interaction with its environment, both environment and unit act as a mutual source of perturbations, triggering changes of state. This process is called structural coupling.

When applied to an economic organisation with a network computer, this would work out the same. Typical examples of interactions that cause structural changes are acts of cyber crime. These phenomena force an organisation to adapt its structure, and thus trigger changes of state. Namely the introduction of a new component in its structure, which protects the organisation - a so-called firewall, for instance. Hopefully this prevents electronic bank accounts from being stripped, and protects the organisation from bankruptcy.

Structural coupling is always a mutual process. Both the unit and its environment undergo transformations. The structural changes that occur in the unit are, it seems, 'selected' by the environment and vice versa through a continuous chain of interaction. This chain of interaction could have caused many other transformations in the unit or the environment, but these have not occurred. Therefore, the organisation and the environment can be regarded as an ongoing 'selectors' of structural changes. And these changes in the unit result from the structural coupling with its environment.

By way of analogy: The presence of oxygen in the atmosphere may have selected structural variations in many lineages of living beings which throughout their phylogeny led to the stabilisation of forms that function as oxygen-breathing beings. Of course, all structural changes in an environment appear as selected too. Millions of years ago cells started to disperse oxygen - one of many gases - and this led to substantial changes in the atmosphere.

Consequently, a unit isn't likely to enter - at least not voluntarily - the domain of destructive change. On the contrary, preserving the organisation will be the unit's top priority when it selects environments to interact with - the changes of state should be beneficial. Units won't select environments that provide a destructive change, at least not when its preservation is in danger. As a human, I wouldn't choose to start breathing under water, i.e. without wearing scuba-diving gear.

When structural coupling happens on a meta-cellular level, the co-drifting organisms give rise to a new phenomenological domain. Maturana and Varela refer to this domain as *'third-order structural couplings'*. Third-order couplings not only occur in the world of animals, but also in the world of humans.

Maturana and Varela claim that the latter order is basically constituted by the same mechanisms as second-order autopoietic systems. Following their claim about third-order structural couplings, groups of people are systems that are somehow subject to the same laws: they conserve and adapt their organisation to their environment, a process which also takes place on a cellular and meta-cellular level. This implies that groups have certain structures. And that a group's structure determines its ability to - necessarily - adapt to its environment, thereby conserving its organisation too. Moreover, in order to conserve their organisation groups select environments to interact with only if these environments provide interactions that cause changes of state. Groups won't select environments to interact with if they provide interactions that lead to a destructive change.

***Short résumé***

Maturana and Varela's statements show that a living being necessarily interacts - in order to survive - with its environment. They also show that its structure dictates its ability to interact with, or to survive in an environment. At the same time, because of interacting over a longer period of time, living systems - among others humans – form groups. Therefore, within the framework of this research, it is stated that:

- A human can be considered to be an autopoietic organisation that interacts with its environment in order to mutually adapt. In doing so, both human and environment conserve their organisation.
- Other humans are also part of the environment.
- When interacting with each other over a longer period of time, humans start to form groups.
- Groups have certain structures.
- A group's structure determines its ability to - necessarily - adapt to its environment, thereby conserving its organisation, and vice versa.
- Moreover, in order to conserve their organisation groups select environments to interact with only if these environments provide interactions that cause changes of state. Groups won't select environments to interact with if they provide interactions that lead to a destructive change.

### 1.1.2. Communication

Maturana and Varela (1998) claim that communication takes place each time there is behavioural co-ordination in a realm of structural coupling.

They see it as a particular type of co-ordinated behaviour, mutually triggered among members of a social unity. But it would be wrong to apply such a broad definition to find out what role communication plays in the interaction between individuals and groups, and the way they adapt. From their point of view, interacting and organising can be considered to be behaviour and thus communication too. However, their claim implies that communication does play an important role in interaction at some level. Therefore, the next step is to find a more specific and applicable conceptualisation of communication that is suited to its role in the interaction.

Communication as an etymological expression is related to both *communion* and *community*. It is derived from the Latin *communicare*, which means, to make common or to share. However, applying this definition would be jumping to conclusions, since communication as a field of research captures a much vaster area, providing an even vaster range of communication concepts. Each communication concept can be captured within a model. Communication models can only be applied or tested in specific communicational situations, depending on how communication is conceptualised from the creator's point of view, i.e. conform what the creator of a model states what communication does and means (van Putte, 1998).

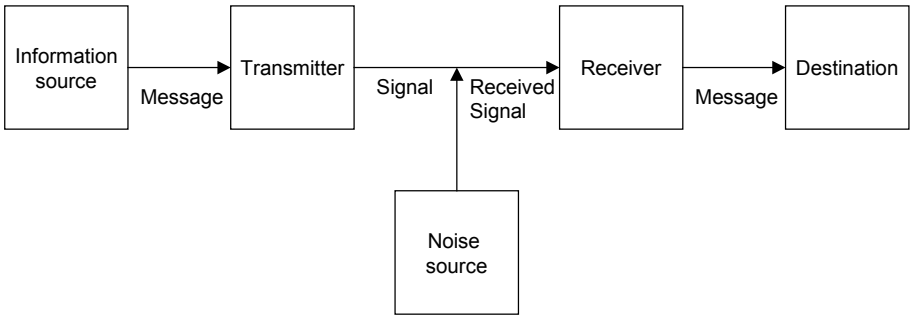
In this line of argument, this research needs a conceptualisation that shows that communication enables living beings - from now on referred to as humans - to interact and adapt to a changing environment, and vice versa.

To find out if communication indeed has such enabling characteristics, a couple of communication concepts and models are listed below. Each model is analysed, in a effort to find characteristics that somehow support the idea of individuals or groups interacting with and adapting to a changing environment. The models are:
- Shannon and Weaver's model
- Lasswell's formula
- Berlo's model
- Egginks'model
- Rogers and Kincaid's model
- Watzlawick's third axiom
- Gerber's model

***Shannon and Weaver's model***
Many communication theories use the concept of communication as a means of transmission: one person acts as a sender who has a message for another person who acts as the receiver. Thinking of communication as a means of transport is based on physics and originates from the Industrial Revolution. Applying a physical point of view to explain every observance was common ground. During this period the portrayal of mankind was derived from the idea that the Industrial Revolution had destroyed all social ties. Thus turning civilisation into a mass-society characterised by social isolation, impersonality and individualism. Therefore, everyone acted and reacted the same, mostly emotionally and non-realistic. In a mass-society mass-people react the same to injected stimuli from mass media. Disturbances within these processes by for example peer pressure were considered impossible since there was complete social isolation (DeFleur & Ball-Rokeach, 1989).

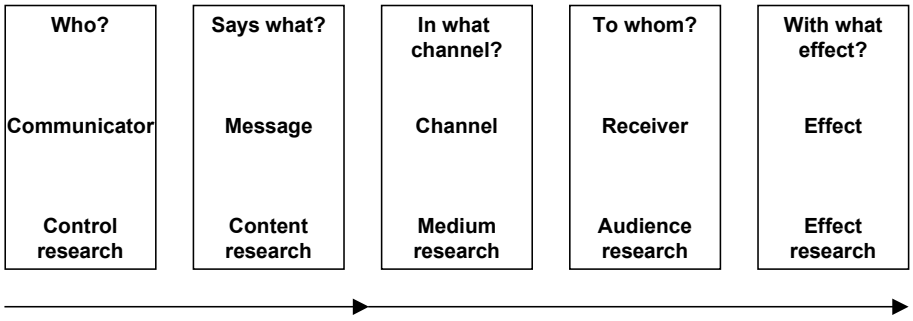
If models are drawn from a transmission point of view, then they mostly

appear in linear forms such as Shannon and Weaver's 1949 model:




***Lasswell's formula***

However, Shannon and Weaver intended to describe the technical aspect of communication, treating communication processes as a single performance. Not surprisingly, their model doesn't support the idea of interaction since communication is presented as a one-way phenomenon. This is contradictory to interaction. Interaction is to be viewed as a two-way phenomenon, if it means: "having an effect on each other". The same goes for Harold Lasswell who drew a formula consisting of five major components:




- *Communicator*
  Lasswell refers to a communicator as some sort of *source* or *transmitter* or *sender* of the message without presupposing that communication does actually take place.

- *Message*
  Lasswell was particularly concerned with the messages present in the media.

- *Channel*
  The channel is what carries the message. If one speaks to another words are carried via the channel of airwaves, the radio news is carried by both airwaves and radio waves. In simple terms, messages can be sent in channels corresponding to the five senses.

  The use of the word 'channel' is similar to the use of the word *medium* when talking about communication. The words are sometimes used interchangeably. However, strictly spoken, one uses the word medium to refer to a combination of different channels. Television for example uses both the auditory channel (sound) and visual channel (sight).

- Receiver

Again, Lasswell uses *receiver* to refer to what might be called audience or readership.

- Effects
  Lasswell's model also introduces the question of media effects. People don't communicate in a vacuum. They most of the time want to achieve something with someone or something. However, Lasswell's model lacks a clear two-way direction.

***Berlo's model***

Indications of communication providing a two-way direction can be found in Berlo's concept of communication. Berlo stresses the role of *relationship* between source and receiver as an important variable in the sending and interpreting part of the communication process.

It is also interesting to note that Berlo impersonalised communication by altering *sender* into *source*. This is similar to a line of argument related to autopoietic organisations interacting with their environment, which can be another autopoietic organisation, but not necessarily. So the autopoietic organisation may be the receiver while the source may be another human, but not necessarily, and vice versa.

Next Berlo enumerates factors to be taken into account at each 'end' of communication:

| Source | Message | Channel | Receiver |
|---|---|---|---|
| Communication skills | Elements | Seeing | Communication skills |
| Knowledge | Structure | Hearing | Knowledge |
| Social system | Treatment | Touching | Social system |
| Culture | Content | Smelling | Culture |
| Attitudes | Code | Taste | Attitudes |

Berlo's model not only states that the ability to send and receive messages (communication skills) determines the way sender and receiver are able to communicate. It also states that the ability to communicate is determined by knowledge, social systems, culture and attitudes. If source and receiver differ too much, effective communication from source to receiver will become difficult or even impossible.

This statement is similar to the phenomenon of structure within autopoietic systems and environments. Because the structures of the environment and the unit have to be mutually compatible. As long as this compatibility exists, the environment can act as a source of perturbations that is able to trigger changes of state within the unit without disrupting it[8]

***Eggink's model***

The only flaw in Berlo's model is that it lacks a description of a certain

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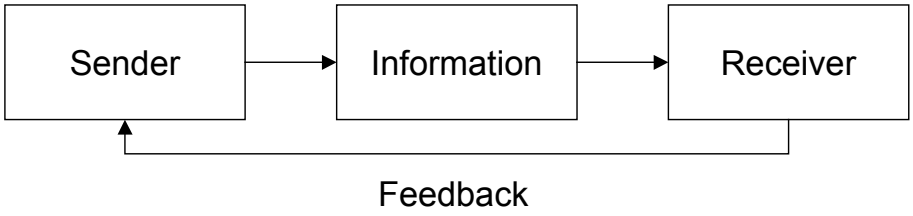
8 The concept of breakdown as explained in the previous section.

reciprocity that is necessary for interaction and mutual adaptation. However, it is too early to conclude that communication doesn't provide interaction and mutual adaptation. Because there are transmission-based models that overcome this lack of reciprocity by introducing the aspect of feedback. Feedback suggests mutuality and therefore interaction. For example Eggink's 1983 communication model:

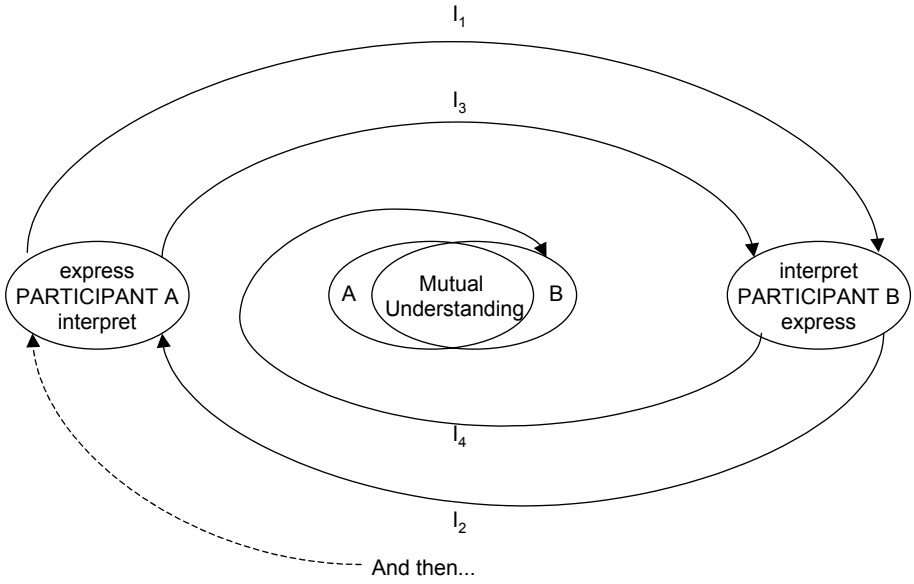



***Rogers and Kincaid's model***

All transmission-based communication models including Eggink's suggest a specific starting point (namely the sender, or the source) and a single-loop communication process. But within the process of mutually adapting units and environments it is unable to pinpoint a starting point other than the moment of first contact. If contact endures that moment - most of the time it does, otherwise our world would have been completely wiped out a long time ago - the interaction and mutual adaptation leads to co-ontogenies with mutual involvement through reciprocal structural coupling. These couplings imply many moments of contact. This again implies multi-loop communication processes instead of single-loop processes.

Notwithstanding the fact that the single-loop idea is imbedded in transmission-based models, communication does not imply the necessity of a specific starting point. The idea of the absence of a specific starting point in communication occurs in specific concepts based on the principle of reciprocity. Namely, those concepts that are based on the idea of convergence.

Rogers and Kincaid (1981), for example, define communication as a process in which the participants create and share information with one another in order to reach a mutual understanding. An important aspect of their concept is the communication continuum. To them there is no starting point in communication. This is stressed by adding the element of "And then…" to their model.




They also emphasise that communication leads to joint action. Messages and information that each of the communicating parties interpret and express are understood on the basis of a cultural situation and psychological reality. In a convergence process these various realities are often to be negotiated in order to reach a more common understanding - telling of both agreement and disagreement. This way communication not only provides units and their environment with the means to interact but also with means for adaptation - for example negotiating on various realities such as cultural background.

If the communication continuum is aligned with Maturana and Varela's concept of co-ontogenies, it is clear that participants who converge via communication somehow become related to each other while communicating.

However, it has to be noted that their idea of communication implies that the final result of communication is always (partial) mutual understanding. Their model doesn't provide for a possible failure or disruption within the process.

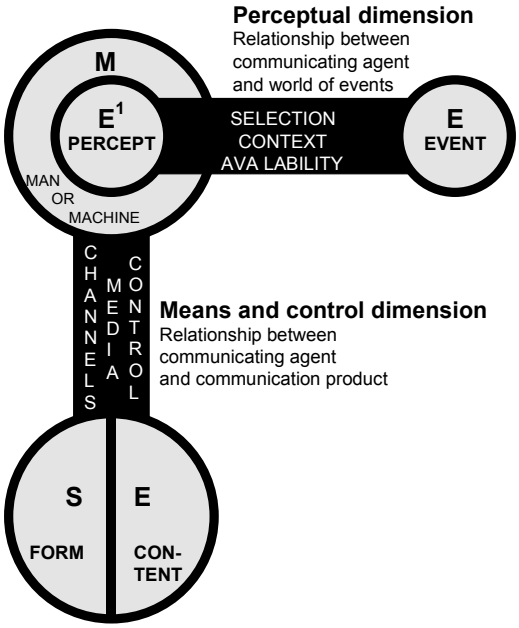
***Paul Watzlawick's third axiom***

The theory of Paul Watzlawick's et. al. consists of five different axioms, or rules of communication. These axioms are used to examine the patterns that can be seen in relationships. He put forward the argument that communication has a content and relationship aspect, and that the latter classifies the former and is therefore meta-communication. This is described in the third axiom as:

*communication = content + relationship*

In this equation, content is *what* is said. Relationship is *how* it is said.

***Gerber's model***




With his model Gerber states that a message not only has an informational aspect but a relational aspect as well:

- E is an event that takes place in 'reality'. E can be a person talking, sending an e-mail , videoconferencing, or otherwise communicating with M. Equally, E can also be an event – an accident, a wedding, etc.
- The event (E) is perceived by M, which can be a man or a machine.The process of perception is a process of active interpretation. The way that E is perceived will be determined by a variety of relationship factors, such as the assumptions, attitudes, points of view and experiences of M towards E.

***Short résumé***

A short résumé of the models listed above can be captured as follows:

- Shannon and Weaver introduced the idea of source, message and receiver.
- Lasswell adds the idea of having an (possible) effect on someone.
- Eggink, and Rogers and Kincaid put forward communication models and concepts that capture loops within the process of communication. This more or less supports the idea of having a mutual influence on each other.
- Rogers and Kincaid made clear that people converge towards each other in order to get a common understanding. This way people not only more or less adapt to each other but they also become somewhat related to each other.
- Lasswell, Berlo and Gerber distinguished and stressed the importance of the channel that carries the message.
- Watzlawick stressed the importance of relationship while interpreting messages.
- Gerber showed that messages themselves have relational aspects too.

Conceptualisation of communication within the framework of this research.

To conceptualise communication within the framework of this research the characteristics of communication have to be focussed in such a way that they align with the conclusions related to humans interacting with their environment:

- A human can be considered to be an autopoietic organisation that interacts with its environment in order to mutually adapt, thus conserving both their organisations.
- Other humans are also part of the environment.
- When interacting with each other over a longer period of time, living beings start to form groups.
- Groups have certain structures.
- A group's structure determines its ability to - necessarily - adapt to its environment, and therefore its ability to preserve its organisation.

Section 1.1.1. clarified that interaction is of the utmost importance for the purpose of adapting and thus for the conservation of organisations, whether these organisations concern individual humans or groups. This indicates that conceptualising communication within this research has to focus on *permanently providing an individual human or group with interaction structures between itself and its environment so it can keep observing its environment and thus adapt to its environment, and vice versa*.

The models listed above more or less prove that communication can do this. Communication can capture the idea of having a mutual effect on each other or converging with each other. This is done by deploying channels and exchanging - by sending, notifying and interpreting **-** messages between communicative participants.

The above leads to the next three conceptualisations of communication that are to be applied within the context of Internet communication media (see also the discussion on the possible application of the conceptualisations within a broader field of communication science, chapter 4.4.2):

1 Communication is: a human exchanging - by sending, notifying and interpreting - messages with his environment while deploying channels. The messages have informational and relational aspects. The aim of communication, for the human, is to obtain information about the environment in order to anticipate possible structural changes within this environment. Thus, the human is able to preserve the structural relationship with his environment. On the other hand he aims to offer information to his environment, which enables the environment to adapt to him.

2 Communication is: people exchanging - by sending, notifying and interpreting - messages within the group they belong to. People deploy channels for that purpose. The messages have informational and relational aspects. The aim of communication within the group is to maintain or, if triggered, make necessary adjustments to the relational structure within this group.

3 Communication is: a group exchanging - by sending, notifying and interpreting - messages with its environment while deploying channels. The messages have informational and relational aspects. The aim of communication is to obtain information about the environment in order to anticipate possible structural changes within the environment so it

can preserve the structural relationship with this environment. On the other hand, the group aims to offer information to its environment, thus offering the environment the opportunity to adapt to structural changes within the group.

***Short résumé***

In order to find elements to create a concept that shows that communication enables humans to interact and adapt to a changing environment, and vice versa, several communication models and theories have been discussed:

- Shannon and Weaver's model
- Lasswell's formula
- Berlo's model
- Egginks'model
- Rogers and Kincaid's model
- Watzlawick second axiom
- Gerber's model.

The elements that were found, among others, are concerned with the exchange of messages, which is also referred to as sending and receiving messages, or expressing and interpreting messages.

It has also been stated that humans, when they interact with each other over a longer period of time, start to form groups. These groups have certain structures. It has been shown that some parts of these messages support the structures of a group. Therefore, at some level, messages determine the communicative relationship between humans.

However, the communicative relationship is not only provided by messages but also by channels or media. Channels or media also provide the link between group members, and between a group and its environment.

In the end conceptualising communication within this research focuses on *permanently providing an individual human or a group with interaction structures between itself and its environment so it can keep observing its environment, and thus adapt to its environment, and vice versa*.

The models more or less prove that communication can do this. Communication can capture the idea of having a mutual effect on each other or converging with each other. Deploying channels and exchanging messages between communicative participants does this. This leads to three conceptualisations of communication.

### 1.1.3. Interacting via the Internet

So far, it has been established that people interact with their environment. Within the interaction they communicate, which means that they exchange messages with their environment while applying channels. These messages have informational and relational aspects. Their aim of communication is to obtain information about the environment in order to anticipate possible structural changes within the environment, so they can preserve the structural relationship with the environment. On the other hand the aim is to offer information to the environment, thereby offering the environment the opportunity to adapt to them.

People may communicate while being in the same space at the same time using speech as a means of communication. However, they can also be in different spaces and use a telephone. Or they may be in different spaces, at different times and use paper and ink. They may even use computers that connect them to the Internet in order to get in touch with each other.

Using the latter not only implies that there are new ways to communicate, but also that it is possible to interact with a new environment. An intangible, Digital World where people can mix with other individuals, groups and organisations without the necessity of physical engagement, let alone presence. As such, communicating while using Internet communication media has a possible impact on how people interact, the way they create structural couplings and how they organise.

However, before presenting the possible forms of impact of the Internet on the way people organise, i.e. on their organisational structure, first the Internet network itself, and secondly several communication media are described.

***The Internet network***

The Internet is a world-wide system of computer networks - a network of networks in which, if in possession of a proper clarification, computer users can get access to any other computer. Sometimes, they can even talk directly to other computer users.

The Internet was conceived by the Advanced Research Projects Agency (ARPA) of the U.S. government in 1969 and was first known as the Advanced Research Projects Agency Network. The aim was to create a network that would allow the users of a research computer at one university to ‘talk to’ research computers at other universities. A benefit of ARPAnet's design was that, because messages could be routed or re-routed in more than one direction, the network could continue to function even if parts of it were destroyed in the event of a military attack or other disaster.

Today, the Internet is a public, co-operative, and self-sustaining facility accessible to hundreds of millions of people world-wide. Figuratively, the Internet and its users create an intangible, Digital World where people meet over a longer period of time, without the necessity of ever meeting in real life. Physically, the Internet uses a portion of the total resources of the currently existing public telecommunication networks. Technically, what distinguishes the Internet is its use of a set of protocols called the Transmission Control Protocol/Internet Protocol (TCP/IP).

TCP/IP is the basic communication language or protocol of the Internet. It can also be used as a communications protocol in a private network, either an intranet or an extranet. When set up with direct access to the Internet, a computer is provided with a copy of the TCP/IP program just as every other computer that one may send messages to or get information from also has a copy of TCP/IP.

TCP/IP Suite is a two-layer program. The higher layer, Transmission Control Protocol, manages the assembling of a message or file into smaller packets that are transmitted over the Internet and received by a TCP layer that reassembles the packets into the original message. The lower layer, Internet Protocol, handles the address part of each packet so that it gets to the right

destination. Each gateway computer on the network checks this address to see where the message should be forwarded to. Even though some packets from the same message are routed differently than others, they will all be reassembled at their destination.

TCP/IP uses the client/server model of communication in which a computer user requests and is provided with a service by another computer in the network. Client/server describes the relationship between two computer programs in which one program, the client, makes a service request to another program, the server, which fulfils the request. Although programs within a single computer can use the client/server idea, it is a more important idea in a network. In a network, the client/server model provides a convenient way to interconnect programs that are distributed efficiently across different locations.

From now on, the TCP/IP suite will be referred to as the Internet network.

***Internet communication media***

TCP/IP includes protocols such as the World Wide Web's Hypertext Transfer Protocol (HTTP), the File Transfer Protocol (FTP), and the Simple Mail Transfer Protocol (SMTP). These Internet protocols support computer servers and clients provided by the upper layers of the OSI reference model.

| **OSI reference model** | **TCP/IP Suite** |
|---|---|
| Application | - |
| Presentation | - |
| Session | - |
| Transport | TCP |
| Network | IP |
| Datalink | Frame Relay |
| Physical | Physical |

From now on**,** these servers and clients will be referred to as Internet communication media, such as:

- Chat programs
- Newsgroup clients
- Electronic mail applications, mail servers
- Web browsers and web servers
- Download programs.

An open standard for real-time chats on the Internet is the Internet Relay Chat (IRC). IRC was intended as a replacement for the program ‘talk’, which allowed people to speak real-time to each other. (Amor, 2000) IRC is a multi-user, multi-channel chat network that allows people to ‘talk’ real-time to each other without being in the same location. In order to get onto the IRC network an IRC client needs to be installed such as Hotline Client, IRC Toons, and IRC. IRC is a client-server based network. Clients need to connect to a particular server that distributes the message sent in by a client back to all recipients that are on a particular channel.

Before logging on to an IRC server one has to choose a nickname and a channel. It is also possible to open up a completely new channel. By opening up a new channel, one becomes the channel operator. Some channels are focused on one topic, other channels offer a platform for people with the same interests, some are even focused on chatting itself, no matter what topic is. In some cases, a private chat can be arranged between

two parties who meet initially in a group chat. Chats can be ongoing or scheduled for a particular time and duration.

A channel operator has certain privileges that allow him to expel or ban other users from that particular channel. These privileges are used to 'manage' communication in the channel and are used when for instance one user starts insulting other users without a reason. The privileges can be passed on to someone else, in case the initiator isn't available. The operator determines the standards on the channel. This channel netiquette is available online and is called the channel FAQ. Violation of the netiquette can also result in being expelled or banned.

An alternative to IRC-chat is the so-called Java-based chat room. Java-based chat rooms enable users to enter a chat by using a web browser. The Java applets are downloaded the same time as the HTML page. Once started it connects back to the server, which then passes the text input from the user to other users who are also connected to the same server on the same channel. Sometimes under the supervision of a television or radio station, celebrities for instance use Java-based chat rooms to chat with fans. Some chat sites allow participants to assume the role or appearance of an avatar[9] in a simulated or virtual reality environment. Other applications that support real time chat are for example AOL Instant Messenger, Mirabiles ICQ or MSN Messenger. However, these applications are based on proprietary standards and other companies or applications do not support the protocols used.

Usenet is a collection of notes on various subjects that are posted to servers on a worldwide network. Each subject collection of posted notes is known as a newsgroup. Newsgroups allow asynchronous meetings and discussions on the Internet. There are thousands of newsgroups and it is possible for anyone to form a new one. Most newsgroups are hosted on Internet-connected servers, but they can also be hosted from servers that are not part of the Internet. Usenet's original protocol was UNIX-to-UNIX Copy (UUCP), but today the Network News Transfer Protocol (NNTP) is used. Newsgroups also have certain standards that are sometimes very sophisticated. Michele Tepper (1997) for example refers to what is called trolling, a 'humour' trap where someone makes a false or naive statement on purpose in order to get others to react, which actually makes the latter look even more stupid. Tepper states that trolling serves a dual purpose: it enforces community standards and increases community cohesion by providing a game that all those who know the rules can play against those who do not. The corrector, who is outside the community in which trolling is practised, believes that he is proving his superiority to the troller by catching the troller's error, but he is in fact proving his inferior command of the codes of the local subculture in which trolling is practised.

SMTP is a TCP/IP protocol used for sending and receiving electronic mail in short e-mail. However, given its limited ability to queue messages at the receiving end, it is usually used with one of two other protocols, POP3 or Internet Message Access Protocol (IMAP), which allow the user to save messages in a server mailbox and download them periodically from the server. In other words, users typically use a program that uses SMTP for

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9 The visual 'handle' or display appearance one uses to represent oneself in a virtual community on the Internet.

sending e-mail and either POP3 or IMAP for receiving messages that have been received for them at their local server. E-mails are usually in text. However, one can also send non-text files, such as graphic images and sound files, as attachments sent in binary streams. Several e-mail clients allow messages to be written in HTML, which enhances the layout-possibilities of e-mails. There are many e-mail clients, such as Microsoft's Outlook, Netscape's messenger, Qualcom's Eudora, or Crunzh's QuickMail.

E-mail can be distributed to lists of people as well as individuals. A shared distribution list can be managed by using an e-mail reflector. Some mailing lists allow users to subscribe by sending a request to the mailing list administrator.

FTP is the Internet protocol for downloading and uploading files. Downloading is the transmission of a file from one computer system to another, usually smaller computer system. From the Internet user's point-of-view, to download a file is to request it from another computer (or from a Web page on another computer) and to receive it. Uploading is transmission in the other direction: from one, usually smaller computer to another computer. Examples of e-mail clients are WS-FTP, TurboFTP, Secure FX, RoboFTP, and iXplorer.

HTTP is the set of rules for exchanging files (text, graphic images, sound, video, and other multimedia files) over the World Wide Web. A technical definition of the World Wide Web is: all the resources and users on the Internet that are using the Hypertext Transfer Protocol. A broader definition comes from the World Wide Web Consortium:

*"The Web is simply defined as the universe of global network-accessible information. It is an abstract space with which people can interact, and is currently chiefly populated by inter-linked pages of text, images and animations, with occasional sounds, three dimensional worlds, and videos." (Tim Berners-Lee, The World Wide Web: Past, Present and Future, 1996).*

An important feature is hypertext, a method of instant cross-referencing. On most Web sites, certain words or phrases appear in text of a different colour than the rest; often this text is also underlined. When selected and activated, one will be transferred to the site or page that is considered relevant to this word or phrase. Sometimes there are buttons, images, or portions of images that are 'clickable'. If the pointer is moved over a spot on a Web site and changes into a hand, this indicates that there is a hyperlink.

A browser is an application program that provides access to the World Wide Web. The word 'browser' seems to have originated prior to the Web as a generic term for user interfaces that let one browse text files online[10]. By the time the first Web browser with a graphical user interface was invented (Mosaic, in 1992), the term seemed to apply to Web content too. Technically, a Web browser is a client program that uses the Hypertext Transfer Protocol to make requests of Web servers throughout the Internet on behalf of the browser user. A commercial version of the original browser, Mosaic, is also in use. However, many of the user interface features went into the first browser that was widely used, Netscape's Navigator. Microsoft followed with its Microsoft Internet Explorer. Today, these two browsers are

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[10] www.whatis.com, October 2000.

highly competitive and the only two browsers that the vast majority of Internet users seem to be aware of. Although many online service providers originally had their own browsers, virtually all now offer the Netscape or Microsoft browser. Lynx is a text-only browser for UNIX shell and VMS users. Other browsers are Opera, Amaya (developed by the W3C itself), Arachne, Hotjava, iBrowse, and iCab.

HTML documents are stored on a web server that distributes the files to the web browsers that log into that particular server. The HTML files are then not displayed as they are but interpreted by the web browser, which then creates the web page, according to the instructions that are part of the HTML code. Originally HTML was supposed to be browser independent. However, the appearance of a particular Web site may vary slightly depending on the browser one uses.

Plug-in applications are programs that can easily be installed and used as part of a Web browser. Initially, the Netscape browser allowed one to download, install, and define supplementary programs that played sound or motion video or performed other functions. These were called help applications. However, these applications run as a separate application. The browser recognises a plug-in application automatically as its function is integrated into the main HTML file that is being presented. Well-known plug-ins are Adobe's Acrobat Reader, which is used for reading text files, and Apple's QuickTime, which is used for viewing animations and playing music. Other plug-ins are for example CoPyCat by Cartesian Products, Curl Surge by Curl Corporation, and GrafixView by InfoMill Limited. Such plug-ins render animation, virtual reality, sound, and music files or streaming video.

Streaming video is a sequence of 'moving images' (occasionally with sound) that are sent in compressed form over the Internet and displayed by the viewer as they arrive. With streaming video a Web user does not have to wait to download a large file before seeing the video or hearing the sound. Instead, the media is sent in a continuous stream and is played as it arrives. The user needs a *player*, which is a special program that decompresses and sends video data to the display and audio data to the speakers. The player is sometimes an integral part of the browser, but it can also be downloaded from the software maker's Website.

Major streaming video and streaming media technologies include RealSystem G2 from RealNetwork, Microsoft Windows Media Technologies (including its NetShow Services and Theater Server), and VDO. Streaming video is usually sent from pre-recorded video files, but it can also be distributed as part of a live broadcast 'feed'. In a live broadcast, the video signal is converted into a compressed digital signal and transmitted from a special Web server that is able to do multicast, sending the same file to multiple users at the same time.

Streaming video uses a lot of bandwidth. Since many network providers, such as telcos or cable companies, have improved their bandwidth by using new network standards such as ADSL, a new Internet feature is initiated called Internet TV. Many broadcast companies embedded this technology in their web sites, enabling users to watch documentaries, newsflashes etc. anytime and as often as they want.

Besides the ongoing improvement on the client side there is a permanent improvement on the server side, which focuses on being more dynamic and

more interactive. In order to process input or data from the client (or other sources, such as databases), a (technical) communication interface is needed, for example the common gateway interface (CGI). CGI is an established protocol for a web server application to receive data from a browser and prepare data before sending it back to the client. Such a feature is necessary in order to provide so-called personalisation. A personalised application (one that requires data specific to an individual or a group) uses a user profile to offer a service that is not identical for all users, but that is tailored to suit the individual user's preferences or interests. The commonest way to use a profile is to store information that allows personalisation on an individual basis. Included in this category is content-based filtering which, when applied to a text document, evaluates the document's relevance by matching the keywords from the user profile with the keywords extracted from the text.

A user profile can also be shared between different personalised applications that require the same user profile's content. For example, two providers of personalised newspapers can collaboratively contribute to the building of a user profile that reflects the interest of the reader. This collaboration enables both applications to gain a deeper knowledge about the user's interest.

A CGI program is able to handle information requests and return the appropriate documents or generate a dynamic document. It can act as a gateway between a database and a web browser. Users are able to express queries using HTML forms that allow the selection of items and the entry of free text, which then can be passed back to the server. For instance, customers can order brochures by filling out an address form and send it to the server where it is processed into a shipment database. CGI programs are scripts or executables that are activated by the web browser and then executed on the web server. CGI specifies how the data is handled between web page and executable. CGI applications are most of the time in C, C++, Perl or Java.

***The Four Virtual Spaces of the Digital World***

As mentioned in chapter 1.1, the Digital World is defined as an intangible, virtual real world created by technology, namely the Internet network and the Internet communication media. The Digital World can be divided into four Virtual Spaces. The four spaces (Anghern, 1997) are a Virtual Information Space, a Virtual Communication Space, a Virtual Distribution Space and a Virtual Transaction Space for users, or groups of users, that access one or more of the four Virtual Spaces of the Digital World by using computers.

I The Virtual Information Space provides individual users and groups of users with information. It contains product information, prices, legislation, opinions, news, hobbies, contact information, etc. Enabling Internet communication media for this space are, for instance, web sites, news groups and bulletin boards.

II The Virtual Communication Space offers the opportunity to users or groups of users to communicate with each other, either synchronously or asynchronously. Enabling Internet communication media for this space are, for instance, e-mail, instant messengers, web cams, Internet phones, chat rooms and internet relay chat.

III The Virtual Distribution Space enables users to move digital goods, such as software or music files, from one point to another. Enabling Internet communication media for this space are, for instance, download managers, file transport protocol and peer-to-peer applications..

IV The Virtual Transaction Space enables users to exchange value. Examples are buying goods, paying taxes and swapping voting rights. Enabling Internet communication media for this space are, for instance, credit card clearance and secure payment applications, cyber bucks and electronic banking via a web interface.

The four Virtual Spaces are subject to constant change because of three different types of contributions to the Internet. One of these contributions is technology. Two other types of contributions can be distinguished in each space, namely;
- utilisation;
- users

***Technology***

To access or support each space, many applications have been introduced. To meet the latest demands, all applications are updated or improved frequently. The following list of applications features and abstract of over 30,000 software titles that have been updated at least once since the beginning of 2000 (Tucows, 2002).

| Virtual Space | Application |
|---|---|
| Virtual Information Space | Web browser - although web browser also enable access to the other spaces - such as 1TabView, 23rdBrowser, Ariadne, BroadScape, Cipher Net, CYBERWORLD Browser, DynaBrowse, Fast Browser Pro, Internet Surfer, Mozilla, MSN Explorer, Netscape Navigator, Oligo, and RoamerZone.<br><br>News service applications such as Desktop News, Infogate, MoNoon Newspaper, My Yahoo! Newsticker, NewsSeek, QuadSucker, Swen, Teletekst Browser, and WorldFlash Newsticker.<br><br>Usenet applications such as Agent, All Picturez, AutoPix, Binary Boy, Binary News, FotoVac, Free Agent, Joc NewsFinder, NewsBin Professional, NewsPro, NewsReactor, X Grab, and X News L5.<br><br>Streaming Applications such as PureCaster, RadioSpy, SonicBox iM Tuner, and vTuner. |

| | |
|---|---|
| | Search bots such as 007 GoldenEye, AFSearch, Answwwer, Atomica, Booksearch, Copernic, DeltaDart, GeoWhare, Huricane Websearch, JOC Shopping Finder, Patrol Search, and SurfPilot. |
| Virtual Communication Space | E-mail clients such as Acorn Email, AllegroMail, Becky, Bewtter Letter, Calypso, DTS Mail, eMovieTime Email, Eudora, Group Mail Free, Incredimail Xe Build, Instinct Mailer, Mail Warrior, and QMA.<br>IRC applications such as DangerScript, dIRC, Hotline Client, IRC Log Viewer, IRC Toons, LeafChat, mIRC, StuBot Professional, and TurboIRC.<br><br>Chat Rooms such as Active Worlds Browser, Chat Anywhere, ChattPOP, Cricket Power Chat, Cybernet Worlds, and Microsoft V-Chat.<br><br>Instant messengers such as ACDExpress, AOL Instant Messengers, AT&TIM Anywhere, Chat-N-Tickle, Comsequenser, CoolRover, CoolSpeak, Eyeball Chat, Firetalk, ICQ, MaxxChat, Miranda, MSN Messenger, Odigo, POD, and SeeStorm Messenger. Internet phones such as BestNetCall, buddyPhone, FunPhone.net, IRIS Phone, MediaRing Talk, PC-Telephone, and Rave. |
| Virtual Transaction Space | Order processing tools such as CardVerifier, Credit Card Checker, Free Credit Card Gateway, Mall Surfer Shop, NetCatalog Shopping cart, Online Store, ODCat, RealCart Shopping Cart, SVA, and WebGenie Shopping Cart..<br><br>Shopper tools such as Darn! Shopping!, iSnipIt, MyListMate, SECURO, and Shop Assist. |
| Virtual Distribution Space | Download managers such as Advanced Internet Tool, Alligator, BitBeamer, Disconnector, Download Accelerator, Downlood Boost, Download Mage, Download Speeder, FlashGet, GetDown, GetRight, Go!Zilla, Mass Downloader, and NetAnts.<br><br>File sharing software such as AAA FTPeasy, Advanced MP3, AFFD Classic, AnalogX TrackSeek, BearShare, Blubster, CompuTwin, File Leech Client, File Messenger, File Navigator, Grockster, LimWire, Napster, and KaZaA. |

Moreover, technology and concepts that can't be related to a single spaces but to the Digital World as a whole have been introduced too:

| **Technology** | **Concepts** |
|---|---|
| XML, SOAP, UMTS, BleuTooth, SMS, WAP, 3G Wireless networks, palm computers, etc. | xBRL, ebXML, UDDI, pervasive computing, ubiqutous networks, personalised applications, trusted third parties, application service providing, m-commerce, e-procurement, e-government, e-business, etc. |

***Utilisation***

Although the Virtual Transaction Space (VTS) is in itself business driven - no money, no deal, no business - there are many non-business driven types

of communities that make use of some sort of VTS. Several communities in the Digital World focus on exchanging values without any business-driven intention. During the US presidential elections in 2000 several vote swapping sites were initiated, such as www.nadertrader.org, www.votswap2000.com and www.votexchange2000.com. In order to get Gore into the White House and Nader his 5 per cent, people could 'swap' their votes. The vote swapping sites all worked by matching up Gore voters in states that Bush had locked up with Nader voters in states that Gore needed to win. The Nader supporter had to agree to vote for Gore if the other person voted for Nader.

The Virtual Information Space (VIS) seems to be a successful medium for the *empowerment of consumer interests*. The key to empowerment is to get as many people as possible interested in taking a particular action. There are platforms where buyers are able to unite in order to obtain discounts on products, for example www.letsbuyit.com and www.buyers-united.net. Other examples of consumer empowerment are sites where travellers post reviews of the accommodations they visited during their vacation, such as www.wheretostay.com, www.gopelican.com and www.ase.net.

The Virtual Communication Space (VCS) supports *gaming communities*. Gaming communities provide many single and multi-user games varying from simple board games to action, simulation, strategy and role-playing games. A MUD for instance (Multiple User Dimension, Multiple User Dungeon, or Multiple User Dialogue) is a computer program that users can log into and explore. Each user takes control of a computerised persona, avatar, incarnation or character. Users can 'walk' around, chat with other characters, explore areas, solve puzzles, and create their own rooms, descriptions, and items.

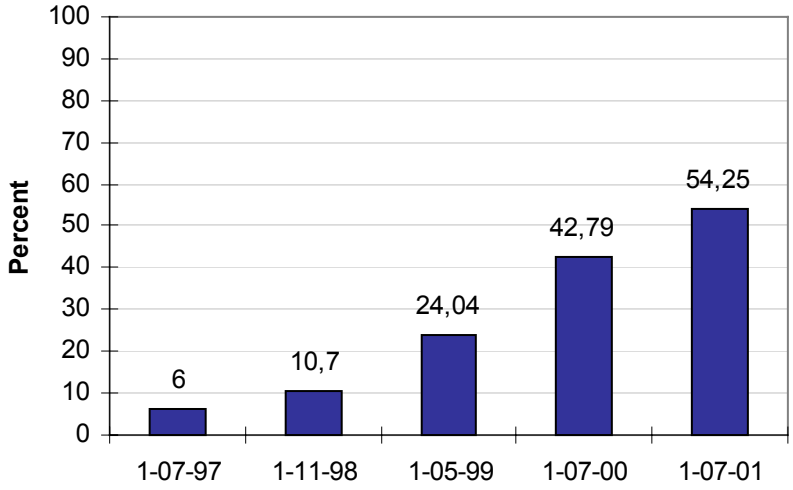
In the Virtual Distribution Space (VDS) the object of exchange can be anything from recipes to poems to music files. Examples are Napster or Gnutella, where thousands of users link their computers together in order to share the music files on their hard disk. Or, after the record industry's court case against Napster, the MP3-search centrals on the World Wide Web that found another way of distributing music files. For instance, by not using the MP3 extension and by using silly or digit filenames which were harder to trace, or implementing a new application, such as KazAa. A third example of sharing is the so-called warez-sites where - besides offering cracks, hacks, and codes within the Virtual Information Space - software has been stripped of its copyright protection and made available for downloading.

All spaces are more or less connected to each other, for example the warez community, Usenet, and in p*ortal sites*. A portal site is a web site that is - or proposes to be - a major starting site for users when they get connected to the Web or which users tend to visit as an anchor site. A number of large access providers offer portals on the Web to their subscribers. The Virtual Information Space-related services that portal sites offer include a directory of Web sites, a facility to search for other sites, news, weather information, stock quotes, phone and map information - www.zonnet.nl is a good example. Portals also feature Virtual Communication Space-related services, by offering e-mail - either for free, for instance www.dolfijn.nl, or at a charge - or a community forum, such as can be found at www.msn.com or www.hccnet.nl.

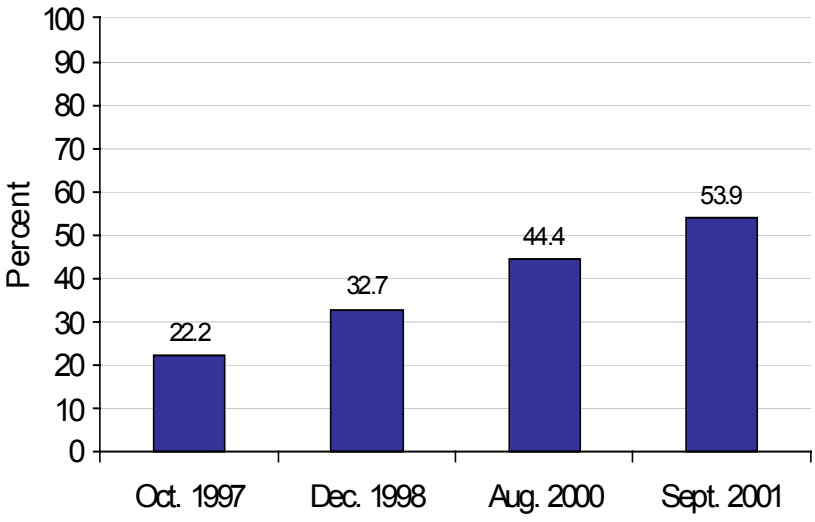
***Users***

However, technology and utilisation aren't the only factors that change. The number of users and the categories of people that access the Digital World change too. As for the Netherlands Internet usage also considerably grew. The table below shows the Internet use by persons from 1997 to 2001 in percentages of the Dutch population (NUA, 2002).

**Internet usage in the Netherlands**



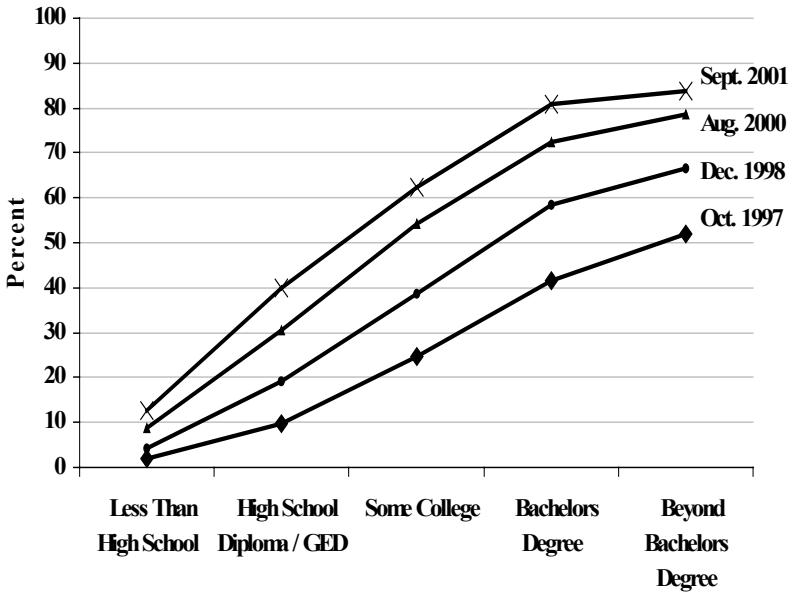

The graphic below shows the Internet use from any location by persons of three years and older in the United States of America from 1997 to 2001 in percentages. As the graphic shows, in September 2001, 143 million Americans - 54 percent of the population - used the Internet, an increase of 26 per cent compared with August 2000 (NTIA, 2002).




The following three graphics will show that not only the total number of Internet users has changed, but also the categories of users. Until the turn of the century, the majority of Internet users were people with higher incomes and higher educational levels. However, as the following three graphics will show, since 2001 Internet use is also growing among people

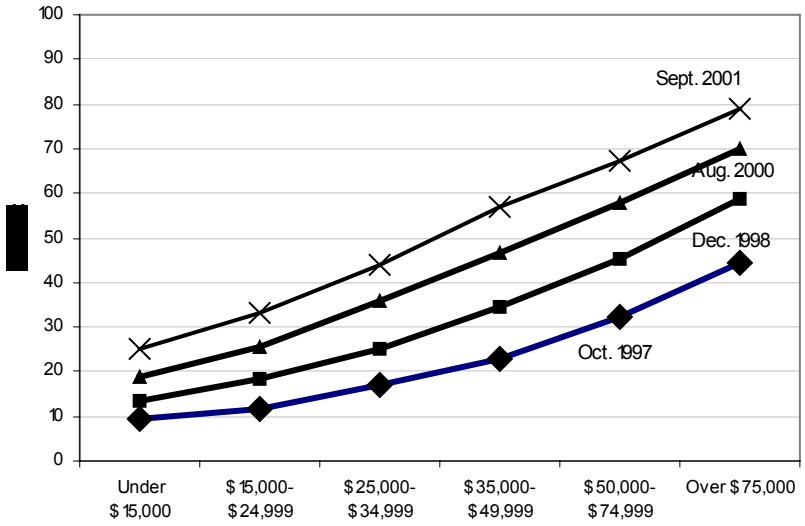
with lower levels of income and of lower educational attainment. The next graphic ('Educational levels') shows that the growth rate in Internet use in the United States of America by adults with a Bachelor's degree and by adults with an education level beyond a Bachelor's between 2000 and 2001 is decreasing compared to earlier years while at the same time Internet use among those with only a high school diploma is still growing by 10 per cent each year, i.e. within this category there is no growth rate decrease. (NTIA, 2002)

**Educational levels**



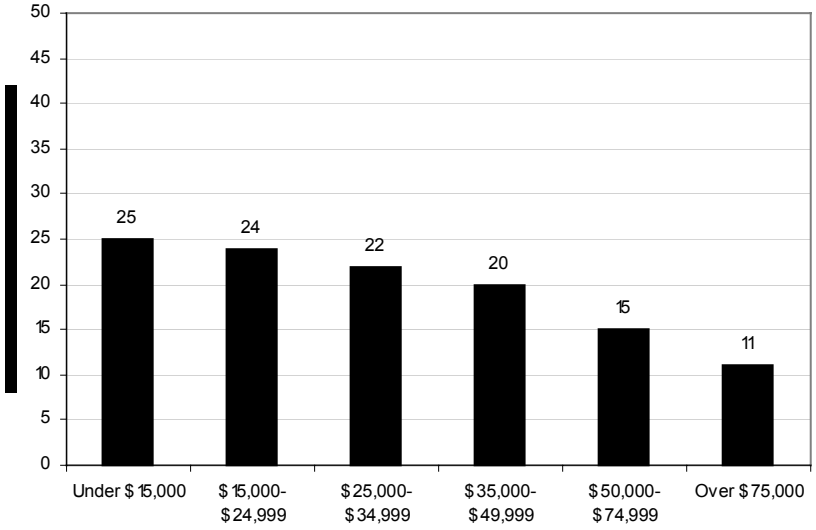

Although Internet use among people with higher incomes are still leading, the next graphic ( 'Income levels') shows that since the turn of the century Internet use among people who live in lower income households in the United States of America is facing a growth rate increase. Among people living in the lowest income households (less than $15,000 annually), Internet use had increased from 9.2 percent in October 1997 to 25.0 percent in September 2001 (NTIA 2002).

**Income levels**




To be more specific, the next graphic (Growth in Internet Use by Family Income) shows that Internet use among people who live in households with a family income of less than $15,000 grew at an annual rate of 25 percent between December 1998 and September 2001 in the United States of America. Over the same period Internet use grew at an annual rate of 11 percent among people living in households with a family income of $75,000 or more (NTIA, 2002).

**Growth in Internet Use by Family Income**




***Possible impact of the Digital World***

An interesting question is whether or not this Digital World can affect the real, organic world. Jan van Dijk (1997) foresees that the new media and the new patterns of interaction in so-called virtual communities will result in the development of new types of language. These languages and patterns offer

opportunities for communication that are not found in face-to-face communication. He refers to what he calls new forms of language, such as smiley's and other emoticons, as a substitute for and an addition to traditional language:

*"The clear lack of nonverbal signs is compensated by new forms of language called paralanguage" (the reality of virtual communities - Trends In Communication, 1997-1, page 46.)*

Terry Winograd and Fernando Flores (1998) point at the fact that a person who sits down at a word processor is not just creating a document, but he is writing a letter or a memo or a book. To them there is a complex social network in which these activities make sense. It includes institutions, equipment, practices and conventions. The significance of a new invention lies in how it fits into, and changes this network. The nature of publishing, the structure of communication within organisations, and the social organisation of knowledge will all undergo changes, as they did with the emergence of other technologies for language, such as the printing press.

Turkle states in her study *Life on the Screen* (1997) that, social beings as we are, we are trying (as Marshall McLuhan said) to retribalize. And the computer plays a central role. She stresses that we correspond with each other through electronic mail and contribute to electronic bulletin boards and mailing lists; we join interest groups whose participants include people from all over the world, and therefore our ties to space have weakened. According to Turkle, these shifts raise many questions:

*What will computer mediated communication do to our commitment to other people? Will it satisfy our needs for connections and social participation, or will it further undermine fragile relationships? What kind of responsibility and accountability will we assume for our virtual actions? (Life on the Screen, 1997, p. 178.)*

Turkle conducted research in the field of sociology and the Internet, specifically within MUDs. One of her conclusions is that in Real Life face-to-face role playing games, someone steps in and out of a character. MUDs in contrast, offer a character or characters that may become parallel identities. She summarises that MUDs blur the boundaries between self and game, self and role, self and simulation. Visitors of MUDs sometimes talk about their screen personae as a means for working on their Real Life lives. In MUDs, the lack of information about the real person to whom one is talking, the silence into which one is typing, the absence of visual cues, all these encourage projection. She found out that this situation leads to exaggerated likes and dislikes, to idealisation and demonisation. MUDs provide dramatic examples of how one can use experiences in virtual space to play with aspects of the self. In her view, electronic mail and bulletin boards provide more mundane but no less impressive examples. There, role-playing may not be as explicit or extravagant, she says, but it goes on all the same.

As Jo Groebel (1997) puts it, newsgroups and forums on the Internet are typical examples of groups that meet over a long period of time without personal contact. Groebel states that this produces new forms of group dynamics:

*"When people meet personally group relationships develop leading to commitment and a minimum level of obligation. With Internet*

*communication, on the other hand, it is possible to join a group for a short period without even having to reveal one's true identity. Social relationships can therefore assume the same sort of flowing character as zapping. This does not have to be viewed pessimistically for our culture, but it does mean that group structures undergo a transformation" (New Media Developments - Trends In Communication, 1997-1, p. 12 )*

Bart van den Hooff (1997) concludes that the substitution of telephone and face-to-face conversations by e-mail has a potentially negative effect on the organisation's social climate. Using media that convey less social information may lead to an organisation in which social exchanges are reduced to a minimum, with negative effects for motivation, productivity and the organisation as a whole.

On the other hand, he asked respondents with regard to first level effects to what degree they perceived changes in a number of aspects directly related to task performance in the organisation. From these results, a positive picture of first level e-mail effects arises. There is a marked increase in the speed of task completion, in the general quality of work and in the quality of the information people get to process their work. However, it must be said that he also found some less positive effects. For example, 80 per cent of the respondents reported an increase in the amount of information they had to process, and 37 per cent reported an increase of the total amount of work.

The same conclusion holds for decision-making. There is a general perception that these effects are positive. Improvements are perceived in decision-making speed, quality and participation.

He also investigated second level effects such as changes in communication patterns that respondents perceived as a result of e-mail usage. The results with regard to these effects are listed below. Presentation is in per centages of respondents agreeing or strongly agreeing that certain effects occurred in their organisation:

| **Effects** | **Per centage** |
|---|---|
| More internal communication | 87% |
| New internal communication | 85% |
| More external communication | 71% |
| New external communication | 75% |
| Less formal communication | 81% |
| Uncontrollable communication | 39 % |

He concludes that, on the whole, the effects of electronic mail on tasks and organisation are perceived as positive by his research respondents. However, communication is also becoming less formal, which allows for more flexible exchanges, which are no longer constrained by formal structures. In Van den Hooff's opinion this carries the risk of uncontrollable information flows. Something, he stresses, that deserves attention when considering the blessings of less formal communication - guarding the organisation against information chaos.

According to Van den Hooff the extent of centralisation and formalisation of an organisation is an important determinant of e-mail adoption and use. Not only was formalisation found to be negatively related to e-mail adoption on the basis of the survey data, but further analyses of the case study data also showed that less formalised organisations tended to use electronic mail

more frequently, perceived the medium as more appropriate for rich communication, and expected more benefits to emerge with regard to task efficiency (first level effects). An organisation's innovative capabilities were also found to be a positive influence on e-mail adoption and use.

***Short résumé***

The Internet provides a widespread network with millions of users that interact with each other via an intangible environment using all sorts of Internet communication media such as browsers and e-mail clients.

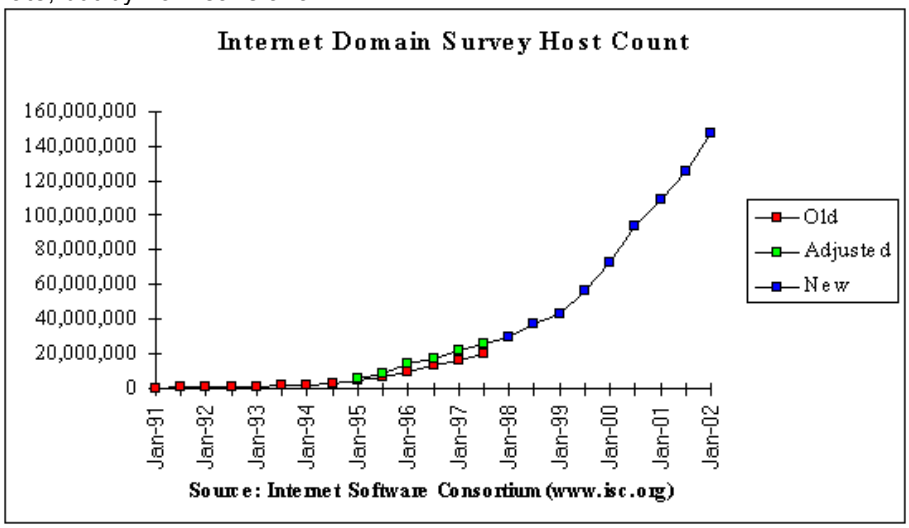
Internet communication media provide new forms of language and group dynamics. Moreover, they can have an impact on an organisation's social climate. Using Internet communication media may lead to an organisation in which social exchanges are reduced to a minimum, with effects for motivation, productivity and the organisation as a whole. It may also increase the speed of task completion and decision-making. Communication within organisations is also becoming less formal, which allows for more flexible exchanges, which are no longer constrained by formal structures.

The above leads to the conclusion that Internet users interact with a new and intangible environment applying new means of communication. This may cause transformations in both organisational structures and in communication itself.

***A few words on the New Economy Shakeout***

In March 1999 the Nasdaq index reached above 5,000. This was its highest valuation ever. But in 2000 the Nasdaq sunk below 2,000, losing more than 60 per cent of its value. Halfway 2001, the Nasdaq was still at this level. The so-called New Economy shakeout raises the question whether or not it dangerously affects the existence of the Digital World.

First of all, the Digital World, as defined at the beginning of this dissertation, already existed long before the term New Economy was brought to light. Secondly, as the IP-number count of Internet Software Consortium shows, the Nasdaq-crash doesn't seem to have an effect on the growth-rate of the Internet. The period 2000 - 2002 only shows a small decrease in the growth rate, but by no means a fall.



Thirdly, even more important, the New Economy shakeout did not mean the end of the New Economy. Shakeouts are not new. They appear in all fast-growing markets. Day and Fein (2001), who studied the phenomenon of shakeouts in market places, state that:

"During the boom period an unsustainable glut of competitors is attracted by forecasts of high growth and promises of exceptional returns. Even when the market is already crowded more entrants keep arriving…. Reality intrudes with a bust that precipitates the exit of more than eighty per cent of the players through failure or acquisition. … Only the strongest and most resilient firms can survive a shakeout. This is a pattern that played out as long ago as the genesis of the railroad, telephone and automobile industries and recently as software and personal computers. (Shakeouts in digital markets, 2001, page 1)"

In the midst of the eighties there were over eight hundred personal computer manufacturers. At the beginning of the third millennium there are eight to ten viable survivors. It is perhaps a little overzealous to put forward that personal computers still exist; luckily, since it is an important tool to enter the Digital World.

*From the above the conclusion can be drawn that the recent New Economy shakeout doesn't dangerously affect the existence of the Digital World.*

### 1.1.4. The research aim

In this section the research aim[11] will be determined. But first the fundamental statements will be put forward. The previous sections drew a theoretical framework that will provide the fundamental statements as follows:

*Organisations (1.1.1)*: showed that
- A human can be considered to be an autopoietic organisation that interacts with its environment in order to mutually adapt. In doing this both human and environment preserve their organisation.
- Other humans are also part of the environment.
- When interacting with each other over a longer period of time, humans start to form groups.
- Groups have certain structures.
- A group's structure determines its ability to - necessarily - adapt to its environment and therefore its ability to conserve its organisation, and vice versa.
- In order to conserve their organisation groups select environments to interact with only if these environments provide changes of state. Groups won't select environments to interact with if they provide a destructive change.

*Communication (1.1.2)*: stated that
Communication within this research had to focus on *permanently providing*

. . . . . .

11 Exploring what influences an Internet-related virtual front office has, both on an organisation's structure and on its internal communication structure.

*an individual human or group with interaction structures between itself and its environment so it can keep observing its environment thus adapt to its environment, and vice versa*.

The communication models more or less proved that communication can do this. Communication can capture the idea of having a mutual effect on each other or converging with each other. This is done by deploying channels and exchanging messages between communicative participants (or sources and senders on the one hand and receivers on the other hand). This lead to the three conceptualisations of communication within the context of Internet communication media:

1 Communication is: a human exchanging - by sending, notifying and interpreting - messages with his environment while deploying channels. The messages have informational and relational aspects. The aim of communication, for the human, is to obtain information about the environment in order to anticipate possible structural changes within this environment. Thus, the human is able to preserve the structural relationship with his environment. On the other hand he aims to offer information to his environment, which enables the environment to adapt to him.

2 Communication is: people exchanging - by sending, notifying and interpreting - messages within the group they belong to. People deploy channels for that purpose. The messages have informational and relational aspects. The aim of communication within the group is to maintain or, if triggered, make necessary adjustments to the relational structure within this group.

3 Communication is: a group exchanging - by sending, notifying and interpreting - messages with its environment while deploying channels. The messages have informational and relational aspects. The aim of communication is to obtain information about the environment in order to anticipate possible structural changes within the environment so it can preserve the structural relationship with this environment. On the other hand, the group aims to offer information to its environment, thus offering the environment the opportunity to adapt to structural changes within the group.

*Interacting via the Internet (1.1.3)* indicated that
Internet users interact with a new and intangible environment by applying new means of communication, namely Internet communication media. This may cause transformations, both in the organisational structures and in the communication itself.

The latter leads to the assumption that if a group adopts the Internet network and Internet communication media it creates a channel to the permanently changing Digital World. From that moment on it may receive perturbations from that Digital World. These perturbations may trigger changes within the structure of the group.

Moreover, these new channels carry new types of messages, i.e. new informational aspects, such as emoticons, or new relational aspects, such as being a newbie or an experienced user, being a user that is in another time zone, etc. Therefore, the Internet network and Internet communication media generate new types of communication processes, i.e. new channels

for exchanging - by sending, notifying and interpreting - messages, which involves new types of information and new relational aspects.

***Fundamental statements***
The above leads to the next seven fundamental statements:

1 A human can be considered an autopoietic organisation that interacts with its environment. Both do this in order to adapt to each other and therefore conserve both their organisations.

2 As humans interact with each other over a longer period of time, they form groups. Groups develop certain structures. A group's structure determines its ability to adapt to its environment.

3 In order to conserve their organisation, groups preselect environments to interact with only if these environments provide changes of state. Groups won't select environments to interact with if those environments will lead to destructive change.

4 Communication, especially through channels and media, meta-communication and the relational aspect of messages, is able to provide the structural relationship within a group and between a group and its environment.

5 If a group adopts the Internet network and Internet communication media it creates a channel to the Digital World. From that moment on it may receive perturbations from the Digital World. These perturbations may trigger changes in the structure of the group.

6 Internet communication media generate new types of communication processes, i.e. new channels for exchanging - by sending, notifying and interpreting - messages, that involve new types of information and new relational aspects.

7 The adoption of Internet communication media leads to changes in the structural relationships within a group and between a group and its environment.

Especially the last four statements lead to the preliminary assumption that adopting Internet communication media can trigger a change in the way groups are structured and the same holds true for their structural relationship with their environment.

It is possible to define a group as two or more individuals, interacting and interdependent, who have come together to achieve particular objectives. Groups can be either formal or informal. Formal groups can be defined by an organisation's structure, with designated work assignments and established tasks, such as command groups or task groups. In contrast, informal groups are alliances that are neither formally structured nor organisationally bound, such as interest groups or friendship groups (Sayles, 1957).

For pragmatic reasons this research focuses on formal groups or, more precisely, formal organisations. After all, changes in group structure are more likely to be detected in a formal setting, in which a redefinition of

formalised structures is more noticeable.

After the introduction of the World Wide Web technology in 1991, a huge number of organisations embraced the Internet. They designed their first homepages and presented them to the world. Often these homepages were one-on-one translations of the organisations' brochures. As time went by, the presentations became both increasingly comprehensive, and technically interactive. Gradually, the presentations evolved into complete virtual front offices. Nowadays, organisations can be contacted via e-mail or online chat and goods can be ordered, paid, and – in the case of software - distributed at the same time. Front offices were introduced and separated from the organisations themselves (leaving behind so-called back offices). Within and via these virtual front offices all sorts of services are hosted that originate from the back offices.

A virtual front office provides an organisation with a channel to the permanently changing Digital World. But will this channel bring perturbations, which change the structure of an organisation? And will these changes be either adaptive or disruptive? The first part of the research aim revolves around these questions, and can be worded as follows*: "Exploring what influences an Internet-related virtual front office has on an organisation's structure".*

However, communication not only provides the structural coupling with the environment, it also plays an essential role in the structure of the organisation itself, as the members of an organisation interact with each other too. This implies that changes in the organisational structure can cause the internal communication structure to change as well. Apart from that, it can also be the other way round: changes in the internal communication structure can change an organisational structure too. Major changes in the relational aspects of communication can cut off teams from essential information and disable parts of an organisation's structure, eventually forcing a structure to change. For instance, departments that are excluded from important task information, because employees lack the skills to communicate via computers, risk underperformance. Eventually, this may lead to management dissatisfaction, a reorganisation or a cut in personnel. This indicates that communication and organisation structures are virtually intertwined. Therefore, it is not only necessary to look at the impact of a virtual front office on the organisational structure. But it is also necessary to find out what impact a virtual front office has on the internal communication structure. Bearing the above in mind, the second part of the research aim can be deduced as follows: *"Exploring what influences an Internet-related virtual front office has on an internal communication structure."*

Combining the two parts, the research aim can be worded as follows:

| |
|---|
| Exploring what influences an Internet-related virtual front office has, both on an organisation's structure and on its internal communication structure. |

***Important notice***
The aim of research captures a more abstract, structural approach with regard to organisations. The level of the individual in organisations is not the level of analysis in this investigation. Some may legitimately criticize the absence of this level. Of course, individuals are important to the constitution of an organisation. Without them there would be no organisation. Moreover,

individuals contribute to the success or failure of an organisation. However, it would not be consistent to the structural approach that is chosen in this dissertation to take the level of the individual as a starting point. In my opinion the structural approach produces sufficient explanatory power, as I hope to prove in this dissertation.

Another, more pragmatic and ethical argument for excluding the level of the individual in this dissertation is related to the research method: a single case study. The case study involves a research location with relatively few individuals. Reporting detailed outcomes of observations at the individual level would mean that it would be easy to reduce these data to particular persons. This would not only lead to a violation of the confidentiality of particular acts and ways of working any organisation possesses but also to a violation of individual privacy. Ignoring this argument in an attempt to contribute to basic science would have made this investigation simply impossible.

## 1.2. Setting the sights

This chapter captures the second part of the theoretical framework. It provides the theoretical handle to explore what influences an Internet-related virtual front office has on an organisation's structure and its communication structure. It captures three sections: an elaboration of the research units as derived from the research aim and how to can be characterised (1.2.1), the hypotheses (1.2.2) and the central research question (1.2.3). Finally, a graphical overview of the fundamental idea of this dissertation is presented (1.2.4).

### 1.2.1. Research units and characterisation

Deduced from the research aim, there are three separate research units to be distinguished:
- Virtual front office
- Organisational structure
- Internal communication structure.

***Virtual Front Office***

How to define a virtual front office? In order to answer that question another question has to be answered first: Why do organisations go to such great lengths to develop and implement a virtual front office that enables them to interact with a digital environment in the first place? A possible answer to this question is that organisations are in need of something that the environment possesses. Something the environment is willing to exchange for something the organisation possesses and which the environment is in need of. Exchanging is only one of many ways in which someone can obtain a desired object. Other ways, for example, are hunting, fishing or gathering. People, organisations or nations can exchange by means of transaction. A transaction consists of a trade of values between two parties. One party gives X to another party and gets Y in return. Kotler (1975) defines

transaction as offering a value in order to change it with another value[12]. In order to get to a transaction two terms have to be fulfilled:
- There have to be two parties.
- Both parties must posses something that is of value to the other party.

It is in an organisation's best interest to keep obtaining value from its environment. Therefore, it has to ensure that the environment is permanently willing to trade its object(s) of value with the organisation's object(s) of value. One of the instruments that organisations deploy in order to succeed is defined as the marketing mix, which contains a set of controllable tools that the organisation blends to produce a response in what is called the market. The marketing mix consists of everything the firm can do to influence the demand for its product. The many possibilities can be divided into four groups of variables, known as the Four P's: product, price, place and promotion (McCarthy 1960).

There is a concern that the Four P's model is based on the seller's view of the market, not the buyer's view. Lauterborn (1990) proposed a new marketing litany called the Four C's: customer solution, customer cost, convenience, and communication.

Another type of comment is made by Waterschoot and Van den Bulte (1992) who state that the classification property(-ies) or rationale for distinguishing four categories labelled 'product', 'price', 'place' and 'promotion' have never been explicated. They argue that though casual observation of practitioners, students and textbooks suggest that there is a general consensus to classify marketing mix elements in the same categories, the lack of any formal and precise specification of the properties or characteristics according to which marketing mix elements should be classified is a major flaw. They recognise three flaws in the Four P's model:
- The properties or characteristics that are the basis for classification have not been identified.
- The categories are not mutually exclusive.
- There is a catch-all subcategory that is continually growing.

Grönroos (1996, 1999) contributes to their comment by stating that the Four P's were never applicable to all markets and to all types of marketing situations. Other paradigms such as relationship marketing will be needed. In a transaction-oriented approach to marketing, the product is the core of the marketing mix. In a customer relationship the outcomes themselves, including goods, services outcomes or industrial equipment, become just one element in the holistic, continuously developing service offering. Such a relationship includes the exchange or transfer of physical goods or service outcomes performed in a trustworthy and timely manner. But in addition to that a host of service elements has to be offered, without which the goods or service outcomes may be of limited value or without value for the customer. Once the relationship has been established it proceeds in an interaction process. Therefore, Grönroos (1999) argues that managing the interaction process is the core of relationship marketing.

. . . . . .

12 In his approach value is broadly based and not only referred to as money. Value for instance can also be expressed as productive services (for wages and terms) or religious services (for material and immaterial support).

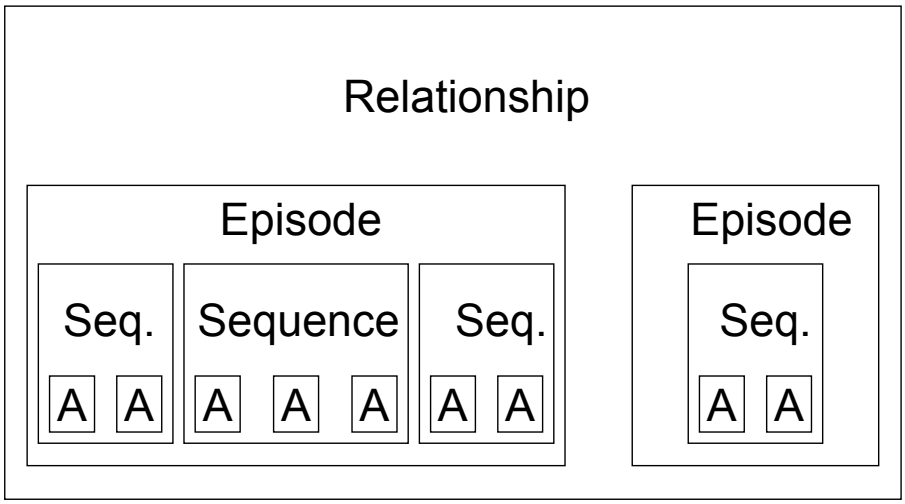
Holmlund (1996, 1997) has developed an understanding of the interaction process within the context of relationship marketing, in order to achieve an extended analytical depth in the analysis of relationships. In the figure below the interaction process of the on-going relationship is divided into four levels of aggregation: the action, episode, sequence and relationship level[13].

*Actions* are considered to be the smallest unit of analysis in the interaction process. Examples are phone calls, receiving an e-mail, web site visits, service calls and hotel registration.

Interrelated acts form a minor natural entity in a relationship, an *episode* such as a negotiation, and a shipment of goods and dinner at a hotel restaurant during a stay at that hotel. Every episode includes a series of acts. Interrelated episodes form the next level of analysis in the interaction process, a *sequence*.

According to Holmlund (1996) sequences can be defined in terms of a time period, an offering, a campaign or a project, or a combination of these. For instance, in a banking context a sequence comprises everything that takes place during one visit to a particular bank.

The final and most aggregated level of analysis is the *relationship*. Several sequences form the relationship. Sequences may follow each other directly, may overlap or may follow with longer or shorter intervals, depending, for example, on the type of business.




Obviously, enabling actions, episodes and sequences are the cornerstones of a relationship. The question is how to enable such cornerstones when dealing with the Digital World? As mentioned in chapter 1, the ICDT-model proposes four categories of Virtual Spaces that give economic agents alternative channels for exchanging information, communicating, distributing different types of products and services, and initiating formal business transactions. Namely, a Virtual Information Space, a Virtual Communication Space, a Virtual Distribution Space, and a Virtual Transaction Space.

. . . . . .

13 Holmlund also suggests a fifth level of aggregation, a partner level, for situations where network partners are required in a business relationship. This level is omitted here

From the point of view of relationship marketing, products need to be supported by services in order to gain value. Offering services via what Anghern (1997) refers to as alternative channels to agents presumably means offering services through at least one of Virtual Spaces by using technical carriers. Offering an information service may, for instance, involves providing information through the Digital World via electronic magazines (e-zines), which are distributed via e-mail, thus creating a channel between the organisation and the Virtual Information Space. It is possible to distinguish four different types of services that an organisation can offer in order to raise the value of a product:

- Information Services. For example information on location, new versions, and prices etc. of products. But also, access to personal information or the ability to alter information;
- Communication Services: communication services enable users to communicate directly, either synchronously or asynchronously, with the members of an organisation. For example, when a user has a question that the product information does not answer, he can get in touch with a product specialist in the organisation, who provides him directly with the required information. Besides, a user must be able to file a complaint.
- Transaction Services: this service not only includes the actual payment, but also the steps prior to payment, such as declaration or invoice.
- Distribution Services: in order to use a product someone obviously has to supply the product, but it should also be possible to send it back, in case of malfunction.

The Internet Network and Internet Communication Media provide organisations with technical carriers, such as web sites, news groups, or e-mail. These technical carriers in their turn provide services. Together, the technical carriers and the services construct channels between the organisation and the Digital World. On the basis of these considerations, a virtual front office can be defined as follows:

A virtual front office is a channel between an organisation and one or more of the Virtual Spaces of the Digital World. The channel consists of an Internet network and the Internet communication media that carry the Information Services, Communication Services, Transaction Services and Distribution Services that an organisation offers in order to raise the value of its product(s).

On the basis of this definition, an Internet-related, virtual front office can be determined by describing two characteristics:

- Both the Internet Network, i.e. the TCP/IP Suite, and the Internet Communication Media, i.e. servers and clients provided by the upper three layers of the OSI reference model, that constitute the carriers for the several virtual front office services.
- the several virtual front office services that are actually offered via the carriers.

A Virtual Front Office and its services differ from a ‘traditional’ Front Office and ‘traditional’ Front Office services in that the latter aren’t Internet Network- and Internet Communication Media-related, but involve a physical front desk, a call centre, or a combination of these.

Of course, there are products available in all four Virtual Spaces of the Digital World that are a constitution of information (for example news, digital newspapers), communication (for example web chat sites, multi-user game

sites), transaction (for example gambling), or distribution (for example paid x-rated movie download sites). But these are *products* and should not be mixed up with *services*, which support a product.

***Organisational structures***

This section deals with the question: “How to define an organisational structure?”. There are several definitions on organisational structure. For instance, organisational structure is the definition of how job tasks are formally divided, grouped and co-ordinated (Robbins, 1996).

Scientific Management, a Classical theory, tried to describe how scientific methods could be applied to define the single best way for a task to be completed. Taylor(1991; 1998), for instance, defined four principles of management. Applying these principles would be advantageous to both management and workers:

- Develop a science for each element of man’s work, which replaces the old rule of thumb method.
- Scientifically select and then train, teach and develop the workmen.
- Heartily co-operate with the men to ensure all work is done in accordance with the principles of the science that has been developed.
- Divide work and responsibility almost equally between management and workers. Management takes over all work for which it is better fitted than the workmen.

Another Classical approach was the so-called Administrative Theory. This theory tried to define universal management performance functions and good-management-practice principles. An example is Fayol (1916; 2001), who proposed five management functions: planning, organising, commanding, co-ordinating and controlling.

A third Classical approach was the so-called Structural Theory developed by Weber (1947). The structural theory covered authority structures and described organisational activity as based on authority relations. Weber described an ideal type of organisation called the bureaucracy. This system had a clearly defined hierarchy, detailed rules and regulations, and impersonal relationships. Weber’s ideal bureaucracy featured:

- Functionalisation
- authority hierarchy
- formal selection
- formal rules and regulations
- impersonality
- career orientation

However, Scientific Management, Administrative Theory and Structural Theory were criticised because of their lack of attention to the human factor within organisations. The human factor was recognised in the 1930 with the Behavioural era. Following the stock market crash of 1929, the United States and much of the world’s economy entered the Great Depression. To help relieve he effects of the Depression on the U.S. Labour force, President Roosevelt supported the Wagner Act, which was passed in 1935. This act recognised unions as the authorised representatives of workers, able to bargain collectively with employers in the interest of their members. In response to this legislation, managers in industry became much more open to finding new ways to handle their employees. Having lost the battle

to keep unions out of their factories, management began to try to improve working conditions and sought better relations with their work force (Robins, 1996). During this period a new organisational theory called the Human Relations approach was born. The essence of this theoretical movement was that the key to higher productivity was increased employee satisfaction. Contributions to this movement are made, in addition to the so-called Hawthorne studies[14], for example by Maslow's theoretical hierarchy of five needs (1954): physiological, safety, social, esteem, and self-actualisation.

Another contribution to human relations was McGregor's (1960) set of assumptions on human nature called Theory X and Theory Y in which X stands for the negative assumptions of managers about employees, while Y represents the positive assumptions of managers about employees.

Another approach within the Behavioural theories was the Behavioural Science Theory. In contrast to the Human Relations approach the Behavioural Science Theory tried to engage in objective research of human behaviour in organisations. Moreno (1947) created an analytical technique for studying group interactions by asking whom they liked and disliked and whom they wished to work with or not. From the results he was able to derive patterns of attraction, repulsion, and indifference among group members. Skinner (1953, 1972) in his turn found that people will most likely engage in desired behaviour when they are rewarded for doing so; these rewards are most effective when they immediately follow the desired response; and behaviour that is not rewarded, or punished, is less likely to be repeated. Fiedler's (1967) contingency model proposes that effective group performance depends on a fit between the leader's style of interacting with his subordinates and the degree to which the situation gives control and influence to the leader. He identified three contingency dimensions that define the key situational factors that determine leadership effectiveness:

- leader-member relations (the degree of trust, confidence, and respect team members have in their leader)
- task structure (the degree to which job assignments are subject to procedures )
- position (the degrees of influence a leader has over, for instance, hiring, discharge, discipline, promotions, and salary increase).

The Classical theories and the Human Behaviour theories clearly handle different paradigms. The Classical theories are based upon the idea that objectives and hierarchies are essential to the successful management of an organisation. Contrary to this paradigm the Behaviour theories focus on the less 'rational' elements of managing organisations. Instead, they concentrate on the human side and on groups. Nevertheless, both the Classical theories and the Human Behaviour theories contribute to the basic assumptions of this dissertation, the Classical theories because their

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[14] The Hawthorne studies (1924-33) were initially undertaken to investigate the relationship between workplace conditions and worker productivity at Western Electric's Hawthorne Works. Investigators found no strong relationship between workplace conditions and productivity but reached several conclusions: individual work behaviour is driven by a complex set of factors; work groups develop norms which mediate between the needs of the individual and institution; employees should not be considered appendages of machinery; awareness of employee sentiments and participation can reduce resistance to change; the workplace is an interlocking social system, not simply a production system; social structure is maintained through symbols of prestige and power. (Sonnenfeld and Myatt, 1998).

paradigmatic element of hierarchy supports the idea of structure and the Behavioural theories because they focus on groups. However, none of these movements or approaches explicitly deals with the outside world of organisations: the organisational environment, which in this case means the digital (outside) world.

Opposite to the approaches of both the Classical theories and the Behavioural theories are the so-called *Contingency approaches* that do take the organisational environment into consideration as an important variable of organisations. Moreover, contingency approaches differ from the Classical and Behavioural era because they reject the idea that there can be a one-and-only way of managing organisations successfully. Whether or not an organisation is managed successfully depends on the situational factor: applying management tool Y in situation X is only successful on the condition of Z, which is the contingency variable.

One of the first movers in the contingency approach was Woodward (1965). She concluded not only that the firms she studied varied considerably in their organisational structure, but also that similar administrative expedients could lead to wide variations in results. Firms in which the organisational structure reflected an implicit acceptance of what has come to be known as classical management theory were not always the most successful from a commercial point of view. She argued that a classical theory did not appear to be adequate as a practical guide to those responsible for the organisation of industry. She found that organisational structures somehow depend on the manufacturing technique:

*"Many of the variations found in the organisational structure of the firms studied did, however, appear to be closely linked with differences in manufacturing techniques. Different technologies imposed different kinds of demands on individuals and organisations, and these demands had to be met through an appropriate structure." (Industrial Organisation: Theory and Practice, 1965, page 1.)*

Woodward drew three different types of manufacturing techniques: small batch, mass production, and continuous production. Mass production firms tended to be more formalised, centralised, mechanistic, and had a larger span of control and less-educated workers than firms working with small batches or continuous process technologies. Successful small-batch and continuous process organisations tended to have organic structures. Successful mass production organisations tended to have mechanistic structures.

Lawrence and Lorsch (1967; 1986) developed an open systems theory of how organisations and organisational subsystems adapt to best meet the demands of their immediate environment, since environmental complexity differs per organisational subsystem:

1. Organisations must balance differentiation and integration to be successful. Companies which manage to achieve high sub-unit differentiation and yet maintain high integration between sub-units seem to be best equipped to adapt to environmental changes.
2. Groups that are organised to perform the simpler, more certain tasks (e.g., production groups) usually have a more formal structure than groups focusing on the more uncertain tasks (e.g., research and development).

3. The time orientation of sub-groups is primarily dependent on the immediacy of feedback from their actions. Thus sales and production groups have shorter time orientations than R&D.
4. The goal orientation of sub-units is based relative to the part of the environment that affects them the most[15].

Environments not only differ in complexity (which refers to the number of singular environmental domains from which it gains input and to which it generates output). They can also differ in dynamics (which refers to the number - few, many - and the nature - progressive, regressive - of intervals in which input is gained and output is generated.), diversity (which refers to the number of different products that are manufactured or the number of markets that are being entered), causal relationships (which refers to the dependence or independence of an organisation on its environment), and external networks (which refers to the constellation network of organisations that are in close range of the organisation, i.e. those who generate input and receive output). All of these environmental variables affect the degree to which tasks routines can be enhanced. If there is little potential for routine enhancement the demands for problem solving potential will rise, and vice versa. In the first case, an organisation is managed best with increased decentralisation, functionalisation (for instance a matrix or project organisation), delegation and participation and decreased standardisation and minimal division of labour. In the second case the opposite has to be applied (Hill, Fehlbaum, and Ulrich - 1998).

So, not only do Contingency approaches stress that the success of management tools such as delegation strongly depends on the situation. They also underline that the organisation's environment affects the way in which the organisation has to be structured. To design an organisational structure several key elements need to be addressed, such as work specialisation, departmentalisation, chain of command, span of control, centralisation, and formalisation (Daft, 1995).

Henry Mintzberg (1983) states that every organised activity gives rise to two fundamental and opposing requirements: the division of labour into various tasks to be performed, and the co-ordination of these tasks to accomplish the activity. He defines organisational structure as follows:

"…the sum total of the ways in which its labour is divided into distinct tasks and then its co-ordination is achieved among these tasks." (Structures in five, 1983, page 2)

The elements of structure should be selected to achieve an internal consistency or harmony, as well as a basic consistency with the organisation's situation, which is not only its size, its age and the technical

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15 Differentiation is defined as: 'the state of segmentation of the organisational systems into subsystems, each of which tends to develop particular attributes in relation to the requirements posed by its relevant external environment.'

Integration is defined as 'the process of achieving unity of effort among the various subsystems in the accomplishment of the organisation's task.'

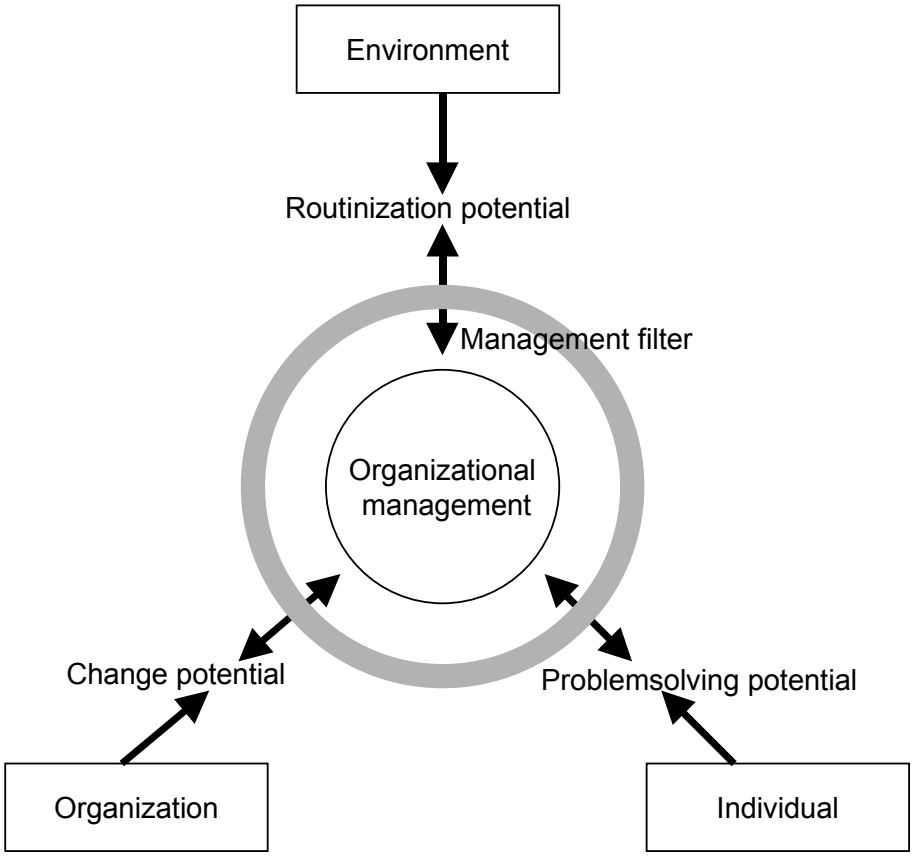
Organisation is defined as a 'system of interrelated behaviours of people who are performing a task that has been differentiated into several distinct subsystems, each subsystem performing a section of the task, and the efforts of each being integrated to achieve effective performance of the system.'

systems it uses, but also the kind of environment in which it functions. The organisation's niche, how large it grows, the methods it uses to produce its products or services are selected too. Therefore, an organisation chooses the situational (or contingency) factors the same as it chooses the elements of its structure. This leads Mintzberg to conclude that to create an effective organisation both the situational factors and the design parameters (division of labor) and the co-ordination of tasks) should be clustered to what are called configurations. Basically, within Minztberg's Contingency approach, there are five co-ordinating mechanisms that provide the design parameters. These co-ordinating mechanisms are considered the basic elements of organisational structure: mutual adjustment, direct supervision, standardisation of work processes, standardisation of outputs, and standardisation of worker skills.

But there is a point that is open for discussion. According to Mintzberg, organisational design should in principle be engaged by delineating all tasks from the overall goals and missions, from general needs to specific tasks. Goals and missions are decided at the strategic apex and pass down the hierarchy. Therefore, designing organisations according to Mintzberg's Contingency approach is essentially a top-down procedure. The *process contingency approach* (Heinsdijk, 1990) on the other hand considers goals not always to be top-down driven. Ideal fits between three units - the organisation's environment, the organisation itself and the individuals within the organisation - shape 'viable' organisations.

These units are interdependent. Moreover, all units do have internal autonomous dynamics. So maintaining a fit between these three units has to be managed. A fit won't last forever by itself. Because there are impulses to change and there are impulses to consolidate. These impulses can originate both inside and outside the perimeter of an organisation. Examples are market dynamics, the desire for independent task fulfilment, employees fearing job losses or managers fearing a decline of their department. Organisational management is located in the middle of these units. There are three force fields that interact with each other. Management has three variables at hand to keep these three force fields in a fit situation, the speed at which the variables are adapted depends on the so-called management filter:

- strategic variables, to be applied to the environment
- design variables, to be applied to the organisation
- control variables, to be applied to the individual




The process contingency design variables are deployed to give shape to the organisational structure. The design variables are amongst others derived from the variables as originally put forward by Hill, Fehlbaum and Ulrich in 1974. The design variables show the division of tasks, competencies, and responsibilities of people and institutions. They also show what the connections between persons and institutions are. Design variables are used to handle the variety of impulses coming from the organisation in order to gain and keep a fit situation. The process contingency design variables are:

- *Functionalisation, breadth and depth*;
  Functionalisation covers the creation of singular functions with certain responsibilities and expectations in which workers have to complete there tasks. Horizontal Functionalisation covers the multi-variance or mono-variance of tasks that are assigned to a singular function. Vertical Functionalisation covers the extent to which a worker is in control of the work to be done.
- *horizontal division of tasks* (equals grouping in Mintzberg's contingency theory);
  The horizontal division of tasks covers the clustering of tasks. Both process contingency and contingency approach make a distinction between functional clustering and market oriented clustering (grouping). Functional clustering is based on knowledge, skill, work process and work function. Market clustering is based on time, client, output or place. The contingency approach states that a market structure is less machinelike, but that it can do more tasks and change tasks more

easily. Its essential flexibility derives from the fact that its units are relatively independent of each other. However, it is arguable whether or not clusters based on work process can be ascribed to a functional clustering. A process can also be described as a set of activities designed to produce a specified output for a particular customer or market (Davenport, 1993). Many established enterprises are using Business Process Re-engineering as a mechanism to react to the massive changes in their environment (Macintosh and Francis, 1997). However, considering the aim of this research, this dissertation doesn't handle the question whether work-process-based clustering should be ascribed to the category of market-based-clustering, or whether it should be distinguished as a separate clustering category.

- *horizontal (de)centralisation*;
  Horizontal centralisation covers the extent to which line management as a formal authority has decisional power. Decentralisation covers the extent to which managers outside the line structures, for instance analysts, control decision processes.
- *delegation*.
  Delegation, also referred to as vertical decentralisation, covers the dispersal of tasks, authority and responsibility down to lower level echelons.

Within the process contingency theory strategic variables are used in order to maintain a fit between the organisation and its environment. Therefore, in order to explore what impact the Internet has on an organisation structure the strategic variables have to be taken into consideration too. There are three strategic variables

- product-market combination, which covers what product is produced for what market
- networking behaviour, which is split up into negotiating with external and internal interested parties, external information gathering, and exploring external conditions.
- collaboration with other organisations in order to reduce the level of interdependence between the organisation and its environment.

In this dissertation organisational structure is defined as*:*

*An organisational structure is the sum of the ways in which its labour is divided into distinct tasks and the way in which co-ordination between these tasks is achieved.*

The answer to the question: "How to define an organisational structure?" is, that an organisational structure can be defined by the sum of the ways in which its labour is divided into distinct tasks and the way in which co-ordination between these tasks is achieved. Since a structure determines an organisation's ability to adapt to its environment (see second fundamental statement), in this research the process contingency variables are used to describe the sum of the ways. In the process contingency theory strategic variables are used in order to maintain a fit between the organisation and its environment. Therefore, in order to describe what influences an Internet-related virtual front office has on an organisation's structure, the strategic variables will also be taken into account. So, in this research the characteristics that belong to organisational structure are;

- design variables: variables that are deployed to give shape to the organisational structure - i.e. Functionalisation, breadth and depth;

horizontal division of tasks, horizontal (de)centralisation; delegation (Heijnsdijk, 1990)
- strategic variables: product-market combination, networking behaviour, collaboration (Heijnsdijk, 1990).

***Internal communication structure***

Before answering what internal communication structures are, the question 'what is organisational communication' needs to be answered. Among al lot of perceptions of organisational communications Goldhaber (1986) detected a few common standards. First of all organisational communication occurs within a complex open system which is influenced by and influences its environment, both internally (called culture) and externally. Secondly, organisational communication involves messages and their flow, purpose direction and media. Thirdly, organisational communication involves people and their attitudes, feelings, relationships, and skills. From these propositions he formulates the following definition of organisational communication:

*"…. The process of creating and exchanging messages within a network of interdependent relationships to cope with environmental uncertainty" (Organisational Communication, 1986, page 17)*

On the basis of this perception of the field of organisational communication he defines seven key elements: process, message, network, interdependence, environment, and uncertainty. The network key element covers the people who occupy specific positions or roles. The exchange of messages among theses people takes place over pathways called communication networks. In all organisations there is both a formal and an informal network of relationships. Kreps (1990) takes notice of an inverse relationship between organisational structure and formal communication channels:

*"Organisational structure directs the development of formal organisational channels. The planed structure of an organisation dictates the formal channels of communication that are to be used by designating who organisation members are to communicate with and what they are to communicate about" (Organisational communication 1990, page 218)"*

The formal network can be trichotomized into downward, upward and horizontal. From this trichotomy, three communication flows can be derived:
- downward communication
- upward communication
- horizontal communication.

Downward communication refers to messages that flow from superiors to subordinates. Most downward communication concerns task or maintenance messages related to directions, goals, discipline, order, or questions. Upward communication refers to messages, which flow from subordinates to superiors, usually for such purposes as asking questions, providing feedback, and making suggestions. Horizontal communication is the lateral exchange of messages among people on the same level of authority (Goldhaber, 1986)

Katz and Kahn (1966) identified five types of downward communications:

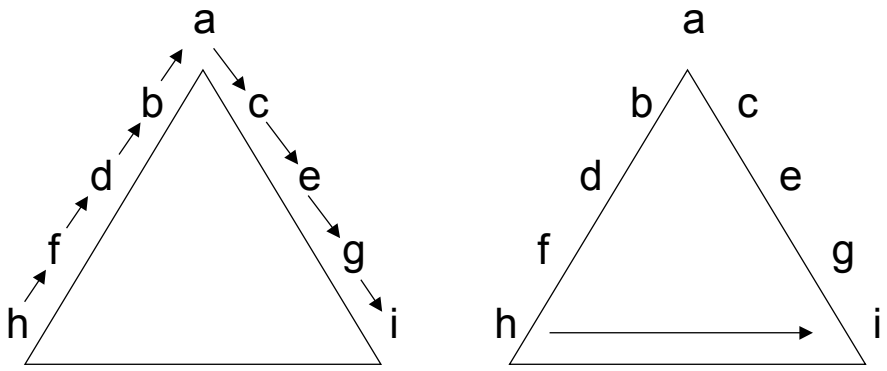
1 Job instructions: directives on how to do a specific task.
2 Job rationale: messages about how a task relates to other organisational tasks
3 Procedures and practice: messages pertaining to organisation policies, rules, regulations, and benefits
4 Feedback: messages appraising how well individuals do their job
5 Indoctrination of goals: messages designed to motivate employees by impressing upon them the overall mission of the organisation and how they relate to these systems of goals.

Upward communication refers to messages that flow from subordinates to superiors, usually for the purpose of asking questions, providing feedback, and making suggestions. Upward communication has the effect of improving morale and employee attitude, and therefore upwardly directed messages are usually integrative or innovative. (Goldhaber, 1986)

Planty and Machaver (1952) pointed out why management should value upward communication:
1 It indicates the receptivity of the environment to downward communication.
2 It facilitates acceptance of decisions by encouraging subordinate participation in the decision-making process.
3 It provides feedback on subordinate understanding of downward communication.
4 It encourages submission of valuable ideas.

Kreps (1990) mentions a similar set of functions:
1 It provides managers with feedback about current organisational issues and problems and information about day-to-day operations that they need for making decisions about directing the organisation
2 It is management's primary source of feedback for determining the effectiveness of its downward communication.
3 It relieves employees' tensions by allowing lower-level organisation members to share relevant information with their superiors
4 It encourages employees' participation and involvement, thereby enhancing organisational cohesiveness.

Horizontal communication is the lateral exchange of messages among people on the same organisational level of authority. Messages that flow in accordance with the functional principle are horizontally directed (Goldhaber, 1986). Horizontal communication was first presented in Fayol's bridge (1916) in which he proposes to reduce the time in which it takes for messages to pass several echelons:




Classic communication pathway Fayol's bridge

*Horizontal communication provides vertical communication Goldhaber (1986) concludes that there are several functions of horizontal communication within an organisation:*

- task co-ordination: department heads may meet monthly to discuss how each department contributes to the system's goal
- problem solving: the members of a department may assemble to discuss how to handle a threatened budget cut and may employ brainstorming techniques,
- information sharing: the members of one department may meet with members of another department to give them new data
- conflict sharing: members of one department may meet to discuss a conflict within the department or between departments.

Besides the downward, upward and horizontal flow, there is a diagonal communication flow. Diagonal communication occurs when two members of an organisation, from both different echelons and different departments, communicate with each other. Diagonal communication is not often formalised. When it is, then in most cases this is done in designing a matrix organisation (Westbroek, 1992).

In determining the flows of internal communication, so-called communication structures can be detected. Within these structures employees, managers and teams communicate while using all sorts of communication media; this way communication media virtually provide the communication structures.

So the answer to what are (formal) internal communication structures is; (formal) internal communication structures cover the network of messages that flow along the formal relationship network within an organisation. The organisational communication structure can be determined by describing the following characteristics:
- Vertical communication flow (both downward and upward)
- Horizontal communication flow
- Diagonal communication flow

### 1.2.2. Hypotheses

In order to put forward the hypotheses, the initial fundamental statements have to be taken into account. The fundamental statements led to the conclusion that adopting Internet communication media may trigger a

change, both in the way groups are structured and in the structural relationship between groups and their environment. Moreover, organisations only choose environments that provide changes of state:

1 A human can be considered to be an autopoietic organisation that interacts with his environment. Both human and environment do this in order to adapt to each other, thereby conserving both their organisations.

2 As humans interact with each other over a longer period of time, they form groups. Groups gain certain structures. The structure of the group determines its ability to adapt to its environment.

The strategic apex - the people who are charged with the overall responsibility for the organisation, i.e. the top-level management plus those organisational members who provide direct support to the top-level managers, such as representatives - is concerned with ensuring that the organisation carries out its mission[16] as effectively as possible. The strategic apex is concerned with three sets of duties:
- direct supervision; this includes issuing work orders, allocating resources and authorizing important decisions
- managing the boundary conditions; its relations with those who control or have power over the organisation
- development of the organisation's strategy; the mediating force between the organisation and its environment, it involves the interpretation of the environment and the development of consistent patterns in streams of organisational decisions (Mintzberg, 1983)

"Thus, in managing the boundary conditions of the organization, the managers of the strategic apex develop an understanding of its environment; and in carrying out the duties of direct supervision, they seek to tailor strategy to its strengths and its needs, trying to maintain a pace of change that is responsive to the environment without being disruptive to the organization" (Structures in fives, 1983, page 14.)

Mintzberg (1983) pointed out that an organisation chooses the situational factors the same as it chooses the elements of its structure. Thus it chooses a particular environment from which it wants to obtain something or to which it wants to offer something. Heijnsdijk (1990) distinguished strategic variables from design variables. Strategic variables are used in order to maintain a contingency with the environment. The Digital World does provide an environment too. As soon as large parts of the regular environment start to turn to this Digital World, it's up to the strategic apex to observe and adapt to the new boundary conditions. Therefore, they will have to make sure that the organisation turns to the Digital World too. Otherwise the organisation will lose access to its environment and lose the opportunity of obtaining something from or offering something to it. Obviously, the latter scenario would not amount to 'carrying out the organisation's mission as effectively as possible'.

For instance, if large groups of taxpayers turn completely to the Virtual Information Space, then a tax administration can only reach that group via

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16 In this dissertation, the mission will be referred to as the most important, overal task or core assignment of an organisation.

that space. If the organisation fails to do so, it runs the risk of not being noticed at all. This would be an awkward situation for a tax administration, especially when massive changes in legislation take place.

By implementing a virtual front office an organisation applies Internet network technology and Internet communication media in order to offer several virtual front office services. As such it creates a channel or several channels between the organisation and one or more of the Virtual Spaces of the Digital World. Following Matura and Varela's claim about third-order structural couplings an organisation will aim to preserve such a channel. So it can continue to interact with its environment. Any environment, including the four Virtual Spaces of the Digital World, is subject to change. For instance, because new concepts or applications, more and other users with other needs or demands, or innovative technology is introduced into the Virtual Spaces -see chapter 1.1.3, the four Virtual Spaces of the Digital World.

An organisation will at some stage aim to adapt this channel to the environment, i.e. its virtual front office that forms a channel between the organisation and one or more of the Virtual Spaces of the Digital World. It will do so as soon as one or more of the Virtual Spaces that the organisation is connected to starts to change. If this involves a history of recurrent interactions that lead to mutual changes, then the channel can be regarded as a structural coupling.

According to the second statement, the structure of an organisation conditions the course of its interactions. In other words, structure of an organisation conditions the structural coupling with the organisation's environment. Assuming that a virtual front office provides an organisation with a structural coupling, then somehow the organisation's design variables condition the flexibility of a virtual front office to adapt it to the Digital World.

In order to find out how this conditioning takes place the next propositions are put forward:

- The *back office* - as opposed to the 'front office' - has to deliver the products that the virtual front office states to be obtainable. Therefore, the more statements are made the more a back office has to deliver. This indicates that the more a virtual front office contains services[17] that add value to the product the higher the delivery demands on its back office will be. For that reason it is crucial for an organisation to match what is stated to be obtainable on one hand with what can be delivered by its back office on the other hand.
- To match the back office with the virtual front office the structural coupling(s) provided by its virtual front office should somehow be connected to its back office.
- In order to realise this connection the structural coupling(s) must be connected to the already existing organisation somehow, i.e. connected to its already existing organisational structure, i.e. supported by its design variables.

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17 - information services;
- communication services;
- transaction services;
- distribution services.

Hill, Fehlbaum, and Ulrich (1998), refer to the productivity of an organisation as the relation between the performances delivered to the environment on one hand and realising these performances - both by the abstraction of resources from the environment and by the performances of the organisational units - on the other hand. Hill, Fehlbaum, and Ulrich (1998), differentiate between first-order productivity and second-order productivity.

First-order productivity focuses on constant organisational processes. Constant organisational processes are a result of constant qualitative and most of the time constant quantitative delivery of performances of the organisation towards its environment on one hand, and constant available resources in the environment and constant performances of the organisational units on the other hand.

Second-order productivity relates to organisational processes of permanent evolutionary or mutating change. These changes are caused by permanently changing qualitative and most of the time permanently changing quantitative delivery of performances of the organisation towards its environment on the one hand. And a permanently changing availability of resources in the environment and permanently changing performances of the organisational units on the other hand.

Hill, Fehlbaum, and Ulrich (1998), make a distinction between two organisational constellations, which are situated on the opposite ends of the same line. Constellation type A has a high potential for routines and a low potential for problem solving. Constellation type B has a low potential for routines and a high potential for problem solving. Type A aims at high rate first-order productivity. Type B aims at high rate second-order productivity. At the same time type A aims at what is referred to as high safety levels. And type B at what is referred to as high levels of independence. Safety levels refer to the level of shielding organisational participants from uncertainty and unexpected environmental reactions. Levels of independence refer to the extent to which organisational participants can decide on how to perform their labour without being exposed to over-taxation that leads to uncertainty or fear. Hill, Fehlbaum, and Ulrich (1998), refer to the following set of variable instruments to support first-order vs. second order productivity, and security vs. - independence:

- Decentralisation, the creation of relatively independent organisational sub units - based on function, division, region, phase or a combination of these - that can anticipate quickly and suddenly changing sub environments. Therefore, high degree decentralisation fosters type B by means of independence.
- Functionalisation is concerned with how many people give assignments to organisational participants, i.e. what is the unity of command? The higher the degree of Functionalisation, the less the unity of command. For instance in a two-dimensional matrix organisation an organisational participant has two superiors. High degree Functionalisation results in uncertainty, as an opposite to independence. Therefore, high degree Functionalisation fosters type B by means of independence.
- Delegation, the transfer of command to subordinate levels. Such a transfer enlarges the decision margins on subordinate levels. As such it contributes to higher independence. Therefore, high-degree delegation fosters type B by means of independence.
- Participation, involving subordinate levels in high level organisational decision making. Participation enables organisational participants to get

involved in how to perform their labour. As such, participation fosters type B by means of independence.
- Standardisation, making routines of succeeding activities by specifying and generalising processes (i.e. making them independent from individual people and singular events). Standardisation increases organisational certainty. Therefore, standardisation fosters type A by means of certainty.
- Separation: to split up the working processes into easy understandable and easy handling steps. As such certainty is raised, which fosters type A.

The above is captured in the following table.

| Type A Variable level | Instrument | Type B Variable level |
|---|---|---|
| Low | Decentralisation | High |
| Low | Functionalisation | High |
| Low | Delegation | High |
| Low | Participation | High |
| High | Standardisation | Low |
| High | Separation | Low |

Organisation type A and B are ideal, or extreme constellations. In reality, as Hill, Fehlbaum, and Ulrich (1998) state, organisations are a mixture of type A and B. Some organisations apply variables that tend to type A, others apply variables that tend to type B. In every organisation first-order productivity competes with second-order productivity - they are inversely related. Moreover, security competes with uncertainty, which are also inversely related to each other. The variables as put forward by Hill, Fehlbaum and Ulrich (1998) encompass the design variables of the process contingency theory that give rise to the organisational structure as defined in this dissertation.

Organisational structures have various degrees of flexibility, and this conditions the course of its interactions. Organisations that apply type B variables will have a higher degree of flexibility than type A organisations, as type B is designed to anticipate permanent evolutionary or mutating change. Organisations that apply variables that tend to type A are not designed for that purpose. They focus on constant organisational processes. As such, a type A organisational structure is rigid. Consequently, given that an organisational structure conditions the course of its interactions, a virtual front office will be less adaptable when the structural coupling(s) provided by the virtual front office is increasingly connected to the organisational structure by applying variables that tend to type A.

As mentioned above, a virtual front office has to keep pace with the changes in one or more of the four Virtual Spaces of the Digital world it is connected to. Otherwise the organisation will lose its structural coupling with it. When an organisation fails to keep pace with these changes, it can no longer adopt the contributions that are introduced into the Digital World, i.e. it will lose access to the opportunities the Digital World provides. Once a virtual front office starts to lag behind, it is considered to have become less adaptable. However, the adaptability of the structural coupling can be measured in more than one way. The difficulties a virtual front office experiences in adopting new contributions to those Virtual Spaces with which it has already established a structural coupling aren't the only yardstick. Other criteria are whether or not it:

- increasingly focuses on controlling the interactions with the Digital World that flow from: A) contributions that have already been adopted from the Digital World, or B) contributions introduced into the Digital World by the organisation itself.
- has the ability to adopt new contributions to the Digital World at all.

Aligning the above with the first two fundamental statements the next four hypothesis can be put forward.

**Hypothesis I**

*In an effort to carry out the organisation's mission as effectively as possible the strategic apex will decide to create a channel to the Digital World, as soon as it observes that the organisation's regular environment is turning to the Digital World.*

- To create a channel to the Digital World is referred to as: to create a channel to one or more of the four Virtual Spaces - the Information Space, the Communication Space, the Distribution Space, and the Transaction Space - of the Digital World.

- The strategic apex is referred to as: the top-level management plus those organisational members who provide direct support to the top-level managers.

- An organisation's mission is referred to as: the most important, overall task, or core assignment of an organisation.

**Hypothesis II**

*By implementing a virtual front office an organisation is able to create a structural coupling with the Digital World.*

- A virtual front office is referred to as: a channel between an organisation and one or more Virtual Spaces of the Digital World. The channel consists of an Internet network and Internet communication media that carry the Information Services, the Communication Services, the Transaction Services, and the Distribution Services that an organisation offers in order to raise the value of its product(s).

- A structural coupling is referred to as a history of recurrent interactions that lead to mutual changes.

- The Internet Network is referred to as: the TCP/IP Suite.

- Internet Communication Media is referred to as: servers and clients provided by the upper three layers of the OSI reference model.

- To create a structural coupling with the Digital World is referred to as: to create a structural coupling with one or more of the four Virtual Spaces - the Information, the Communication, the Distribution, and the Transaction Space - of the Digital World

Hypothesis III

*To maintain its structural coupling with the Digital World an organisation will aim to adapt its virtual front office as soon as the organisation observes that one or more of the four Virtual Spaces that the organisation is connected to starts to change.*

- Changes within a Virtual Space are determined by changes within three types of contributions to that Virtual Space, namely:
  - technological changes
  - changes in utilisation
  - changes of users.

**Hypothesis IV**

*The more the structural coupling(s) provided by the virtual front office is connected to the organisational structure by applying variables that tend to type A, the less adaptable a virtual front office will become.*

- **O**rganisational structure is referred to as the sum of the ways in which an organisations labour is divided into distinct tasks and the way in which co-ordination between these tasks is achieved.

- Variables that tend to type A are referred to as:
  - low decentralisation
  - low Functionalisation
  - low delegation
  - low participation
  - high standardisation
  - high separation

  - **L**ess adaptability is distinguished by a virtual front office that whether or not:
    - increasingly has difficulties in adopting new contributions to those Virtual Spaces of the Digital World with which it has already established a structural coupling.
    - increasingly focuses on controlling the interactions with the Digital World that flow from: A) contributions that have already been adopted from the Digital World, or B) contributions introduced into the Digital World by the organisation itself.
    - can adopt new contributions to the Digital World at all.

  - Contributions to the Digital World constitute of three different types:
    - technological contributions
    - utilisational contributions
    - user contributions

The degree to which the organisation tends to type A not only affects the adaptability of its virtual front office. It also affects the choice of what Virtual Spaces the organisation intends to connect to. To understand why, the third fundamental statement has to be taken into consideration.

3 In order to conserve their organisation, groups select environments to interact with only if these environments provide changes of state. Groups won't select environments to interact with if those environments will lead to destructive change

Consequently, organisations won't choose - or at least they will hesitate before choosing - any environment that will inevitably destroy its structure. To understand why, the productivity of an organisation has to be taken into consideration.

The *productivity* of an organisation is referred to as: The *relation* between:
A the *performances delivered* to the environment on one hand *and*,
B on the other hand, *realising these performances* by both:
  I the abstraction of resources from the environment
  II and performances of the organisational units.

So, if the environment changes, then the *conditions to deliver* to the environment will change too, as will the *conditions to abstract resources* from the environment. If these conditions change, then the *conditions of the organisational units to perform* will have to change too. Otherwise the organisation would become less productive.

If large parts of the organisational units are connected to an environment that changes continuously, then a large part of the organisation will be forced to adapt constantly to those changes. After all, the organisation cannot afford to lose a major and vast connection to the environment it heavily depends upon. If the organisation fails to adapt, then it will run the risk of losing the opportunity both to both deliver to that environment and to abstract resources from it. In that case, it will lose its productivity. When an organisation loses its productivity, it loses its rationale to exist.

Some organisations may implement the services of a virtual front office into their organisation by applying variables that tend to type A. Organisations that support virtual front office services with variables that tend to type A may be hesitant to create a full structural coupling with the particular Virtual Space of the Digital World that covers the organisation's mission the most - i.e. its core business. After all, variables that tend to type A are not designed for coping with permanent evolutionary or mutating changes - which are such a strong feature of the Digital World - that affect the complete organisation. On the basis of the above, the fifth hypothesis can be put forward.

**Hypothesis V**

*An organisation that implements its virtual front office services into its organisation by applying variables that tend to type A, is hesitant to create a full structural coupling with that particular Virtual Space of the Digital World that covers the domain of its core business the most.*

The last four fundamental statements were as follows:

3 In order to conserve their organisation, groups preselect environments to interact with only if these environments provide changes of state. Groups won't select environments to interact with if those environments will lead to destructive change.

4 Communication, especially through channels and media, meta-communication and the relational aspect of messages, is able to provide the structural relationship within a group and between a group and its environment.

6 Internet communication media generate new types of communication processes, i.e. new channels for exchanging - by sending, notifying and interpreting - messages, that involve new types of information and new relational aspects.

7 The adoption of Internet communication media leads to changes in the structural relationships within a group and between a group and its environment.

A virtual front office is defined as a channel between an organisation and one or more Virtual Spaces of the Digital World. Together with the Internet network and Internet communication media, communication services constitute a part of the channel between the organisation and the Digital World. Or, to be more precise, between the organisation and the Virtual Communication Space. Since this communication service channel consists, amongst others, of Internet communication media, part of the channel itself may change. The question is, what change will occur, and when?

Hypothesis IV stated that the more the structural coupling(s) provided by the virtual front office is connected to the organisational structure by applying variables that tend to type A, the less adaptable a virtual front office will become. Such a decrease in adaptability may occur, for example, when the virtual front office focuses on controlling the interactions with the Digital World that flow from the contributions it has already adopted.

So, if an organisation has a virtual front office that provides a structural coupling with the Virtual Communication Space on the one hand, and the organisation supports this structural coupling by applying variables that tend to type A on the other hand, then the change that will occur once a structural coupling with the Virtual Communication Space has been established is captured within a virtual front office that starts to focus on controlling the communication flows.

This, together with the previous four fundamental statements, leads to the next two hypotheses:

**Hypothesis VI**

*An organisational structure and its internal communication structure will change when a virtual front office provides communication services.*

- Internal communication structures cover the network of messages that flow along the formal relationship network of an organisation. The organisational communication structure can be determined by describing the following characteristics:
  - Vertical communication flow (both downward and upward)
  - Horizontal communication flow
  - Diagonal communication flow.

**Hypothesis VII**

*The more a virtual front office is connected to the organisational structure by applying variables that tend to type A, the more the virtual front office will start to focus on controlling communication flows once the virtual front office has provided a structural coupling with the Virtual Communication Space.*

### 1.2.3. The central research questions

To prove that the hypotheses can't be falsified the next seven central research questions have to be answered positively:

1A Does an organisation's strategic apex decide to create a channel to the Digital World because it wants to carry out the organisation's mission as effectively as possible?

1B If so, does an organisation's strategic apex do this as soon as it observes that the organisation's regular environment is turning to the Digital World?

- To create a channel to the Digital World is referred to as: to create a channel to one or more of the four Virtual Spaces - the Information, the Communication, the Distribution, and the Transaction Space - of the Digital World

- The strategic apex is referred to as: the top-level management and those organisational members who provide direct support to the top-level managers

- An organisation's mission is referred to as: the most important, overall task, or core assignment of an organisation.

2 Is an organisation able to create a structural coupling with the Digital World by implementing a virtual front office?

- A virtual front office is referred to as: a channel between an organisation and one or more of the Virtual Spaces of the Digital World. The channel consists of an Internet network and the Internet communication media that carry the Information Services, the Communication Services, the Transaction Services, and the Distribution Services that an organisation offers in order to raise the value of its product(s).

- A structural coupling is referred to as a history of recurrent interactions that lead to mutual changes.

- The Internet Network is referred to as: the TCP/IP Suite.

- Internet Communication Media is referred to as: servers and clients provided by the upper three layers of the OSI reference model.

- To create a structural coupling with the Digital World is referred to as: to create a structural coupling with one or more of the four Virtual Spaces - the Information Space, the Communication Space, the Distribution Space, and the Transaction Space - of the Digital World

3A Does an organisation, in order to maintain its structural coupling with the Digital World, aim to adapt its virtual front office?

3B If so, does the organisation do this as soon as it observes that one or more of the four Virtual Spaces that it is connected to starts to change?

- Changes in a Virtual Space are determined by changes in three types of contributions to that Virtual Space, namely the technological changes, the changes in utilisation or the changes of users of that particular Virtual Space.

4A *Does the organisation connect the structural coupling(s) provided by its virtual front office to its organisational structure by applying variables that tend to type A*

*4B If so, does its virtual front office become less adaptable as the structural coupling(s) provided by its virtual front office are more and more connected to its organisational structure by applying variables that tend to type A*?

- **O**rganisational structure is referred to as the sum of the ways in which an organisation's labour is divided into distinct tasks and the way in which co-ordination between these tasks is achieved.

- Variables that tend to type A are referred to as:
  - low decentralisation
  - low Functionalisation
  - low delegation
  - low participation
  - high standardisation
  - high separation

  - **L**ess adaptability is distinguished by a virtual front office that whether or not:
    - increasingly has difficulties in adopting new contributions to those Virtual Spaces of the Digital World with which it has already established a structural coupling.
    - increasingly focuses on controlling the interactions with the Digital World that flow from: A) contributions that have already been adopted from the Digital World, or B) contributions introduced into the Digital World by the organisation itself.
    - can adopt new contributions to the Digital World at all.

  - Contributions to the Digital World constitute of three different types:
    - technological contributions
    - utilisational contributions
    - user contributions

5A *Does the organisation connect the structural coupling(s) provided by its virtual front office to its organisational structure by applying variables that tend to type A?*

*5B If so, is the organisation hesitant to create a full structural coupling with that particular Virtual Space of the Digital World that covers the domain of its core business the most?*

- Changes within a Virtual Space are determined by changes within three types of contributions to that Virtual Space, namely:
  - technological changes
  - changes in utilisation
  - changes of users.

*6A Does an organisational structure change when a virtual front office provides communication services?*

*6B Does the organisation's internal communication structure change when a virtual front office provides communication services?*

- Internal communication structures cover the network of messages that flow along the formal relationship network within an organisation. The organisational communication structure can be determined by describing the following characteristics:
  - Vertical communication flow (both downward and upward)
  - Horizontal communication flow
  - Diagonal communication flow.

7A *Does the organisation more and more connect the structural coupling(s) provided by its virtual front office to its organisational structure by applying variables that tend to type A?*

*7B If so, does the virtual front office provide a structural coupling with the Virtual Communication Space?*

*7C If so, does the virtual front office increasingly focus on controlling communication flows with the Virtual Communication Space?*

### 1.2.4. Graphical overview of the theory

In an effort to carry out the organisation's mission as effectively as possible the strategic apex will decide to create a channel to the Digital World as soon as it observes that the organisation's regular environment is turning to the Digital World. It does this by implementing a virtual front office.

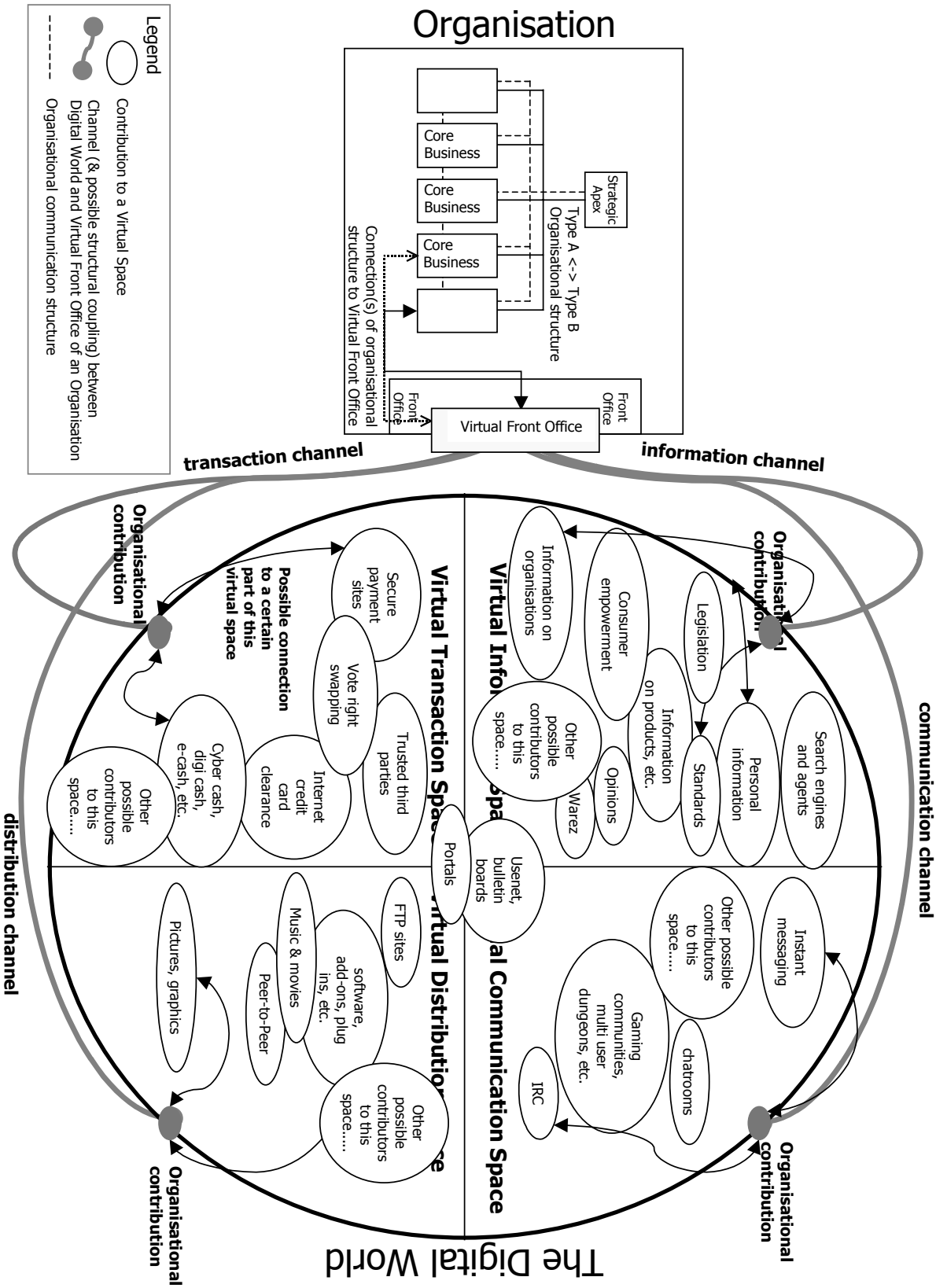
Once the organisation and one of the Virtual Spaces start to adapt to each other via that channel, a structural coupling is created. In order to maintain that structural coupling, the organisation aims to adapt its virtual front office every time one or more of the four Virtual Spaces that the organisation is connected to starts to change. Otherwise the organisation will lose its structural coupling with it. When that happens, the organisation is no longer able to adopt the contributions that are introduced into the Digital World, i.e. it will lose access to the opportunities the Digital World provides.

However, a virtual front office will become less adaptable, the more the structural coupling(s) is connected to the organisational structure by applying variables that tend to type A.

Moreover, an organisation which implements its virtual front office services into its organisation by applying variables that tend to type A, is hesitant to create a full structural coupling with that particular Virtual Space of the Digital World that covers the domain of its core business the most.

Next to that, an organisational structure changes as a virtual front office provides communication services. Moreover, a virtual front office that is connected to the organisational structure by applying variables that tend to type A will start to focus on controlling communication flows once the virtual front office provides a structural coupling with the Virtual Communication Space.

The following picture captures the theory that has been described above.




Facing the Digital World - *Connecting a permanently changing Internet to rigid organisational structures*

# 2. A case study

## 2.1. Introduction

This chapter captures the method that was used to collect and analyse the data of this research into the influences of a virtual front office on an organisational structure and its communication structure. This chapter deals with: determining the research type (2.2), selecting a case study (2.3), collecting samples (2.4) adapting the initial aim and research units (2.5), explaining the data collection methods that were used (2.6), how the data were registered, documented and analysed (2.7 and 2.8), and how the validity of this research was handled (2.9).

## 2.2. Research type

This chapter accounts for the type of research itself (2.2.1), it clarifies the origin (2.2.2) and it enumerates the restrictions (2.2.3) of this research.

### 2.2.1. Typological account

The empirical research can be accounted for as both A) explorative and B) hypothesis developing, and C) qualitative:

A explorative in the first stage of the research; in 1997, it was a relatively new quest, organisations faced a new phenomenon; Internet use started to boom after the mid nineties[18].

B hypotheses developing in the second stage of the research; After the first analysis of the collected data the only conclusion that could be drawn was that the virtual front office exerted little influence on the organisational structure and its supporting communication structure, since these structures had only been subject to small changes. The initial expectation, that 'Internet communication' itself - as some sort of independent variable - would automatically lead to revolutionary changes in communication processes and therefore to structural change within an organisation, was not fulfilled. This conclusion became a trigger that changed the type of research, as it added a new challenge, i.e. finding a potential causal relation, to the original explorative dimension captured in the aim of this research. In other words, after the data showed hardly any influence, the (second stage of the) research focused on studying the collected data for a potential causal relationship between a rigid organisational structure (type A) and a decreased

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18 In the US in 1995 the early adopters embraced the Internet. In April 1997 the early majority phase began. Halfway 2000, the late majority phase began. In the Netherlands, the early adopters' phase lasted until the beginning of 1999. Moreover, on a global scale, at the beginning of 1998 global internet use was still in the innovator phase, in 2002 the global Internet use is - still - in the early majority phase.

adaptability of a virtual front office in order to develop new hypotheses for future research.

C Qualitative, the research concerned a case study of an organisation with relatively few organisational units (see chapter 2.3).

### 2.2.2. Origin

This dissertation was started by two triggers. The first trigger originated in the field of practice and not in a theoretical framework.

In 1997 I worked as a project-manager at the Dutch Tax and Customs Administration (from now on referred to as the Administration). In this post I was involved in the implementation of the Administration's web site (www.belastingdienst.nl) and its e-mail features (…@belastingdienst.nl). Being aware of the impact that external communication media or channels may have on the internal communication structure and the organisational structure it supports, I wondered whether there existed any applicable theories on how Internet communication media affect the internal communication of organisations.

It turned out that there were several theories on hand. However, they varied from being a starting point for empirical research to being too specific, concentrating only on one specific type of communication technology in one specific field of organisational communication:

- Groebel (1997), for example, offers a starting point for empirical research in his '12 I's of the media future'. This work describes twelve fundamental dimensions of future communication which result, to a certain extent, from the functions and psychological moods of individual users.

- Van Dijk (1997) puts forward a clear theoretical answer in his investigation into the degree to which virtual communities may replace organic communities and provide forces to counter the present social processes of fragmentation and individualisation. Virtual communities will not replace organic communities, Van Dijk believes, but they may be able to strengthen them. However, at the same time Van Dijk's answers do not indicate how this strengthening of organic communities in organisational or company settings by virtual communities had to be given shape to.

- Van den Hooff (1997), last but not least, conducted an extensive study into the implementation of electronic mail. However, he only focussed on internal communication, leaving out the impact external communication may have, let alone the manner in which organisations adopt and use other Internet driven technologies and their possible effects.

Given that relatively little research has been conducted on the impact of the Internet on the communication structures of organisations, why not contribute with an applicable theory on how Internet communication media affect internal communication in organisations?

This question led to the decision to start this research. All activities were carried out in my spare time and at my own expense[19 1)]. For quitting my job was not an option, and neither did I expect my employer to pay for the momentary lapse of reason of a member of staff, or for the zillions of possible points of failure.

### 2.2.3. Restrictions

The research aim was subject to two restrictions. The first restriction was an intrinsic matter and was put forward based on the aim of research.

| Exploring what influences an Internet-related, virtual front office has on an organisation's structure and its communication structure. |
|---|

As the research aim implies, this research focussed on a virtual front office which is defined as a channel that consists of an Internet network and Internet communication media. Subsequently, other elements within a front office, whether they are virtual or organic, are excluded from the analyses. Such as the a front-desk, telephone, fax or means of Electronic Data Interchange that do not use web technology, SMTP or other TCP/IP related protocols that run over public Internet network infrastructures.

The second restriction involves the fact that the aim of research and the research questions capture a structural approach. As already mentioned in chapter 1.1.4 in my opinion the structural approach has sufficient explanatory powers on its own. As I hope to prove in this dissertation. Therefore, this dissertation consistently follows the structural approach. Individuals were not the units of analysis in this investigation. This does not mean that there were no data collected at the individual level as individuals were interviewed and observed. However, in the analysis these data were aggregated or transformed to a higher level. So, it was out of the question to ignore particular empirical details. Every empirical detail in this case study that was encountered and relevant in terms of the research questions, including empirical details at the individual level of organisations, was registered and documented by applying a labelling system (see chapter 2.7.1). As a consequence, empirical data that concern the individual level of organisations are not registered and documented as such in the text of this dissertation - confidentiality and privacy were other reason, as explained before. Instead, after these data were collected and recorded they were analysed and transformed to the structural level by applying a labelling system.

## 2.3. Research location of the case study

The location in the organisation from which this case study was performed was the so-called Editorial Internet Office (EIO) of the Administration, in the period running from 1997 until the beginning of 2000. The EIO was responsible for operating www.belastingdienst.nl and handling e-mail. However, before expanding on the characteristics[20] of this location and

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19 Except for the final editorial activities, which were supported by my employer.

20 Actors, activities, space, time and artefacts - Baarda, de Goede, Teunnissen, 1997.

subsequently accounting for this decision, the history and context of www.belastingdienst.nl and …@belastingdienst.nl are captured below.

The Administration is part of the Dutch Ministry of Finance. Its core business is to administer a wide range of tax legislation. This includes levying and collecting taxes, the auditing of bookkeeping systems and the investigation of fraud. The Customs Division of the Administration not only administers tax legislation but also non-tax legislation, mainly in the areas of economics, health and safety. Its duties primarily involve customs control on the import, export and transit of goods[21].

The Administration has a permanent core assignment based on the commissioned legislation. The permanent core assignment expresses the continuing considerations that the Administration has to make. The core assignment is expressed as follows:

The Administration executes the commissioned legislation as efficiently and effectively as possible and it aspires to enforce legal security and equal justice in all its actions. Serving and respecting the public are inextricable linked to these actions.

Activities that cannot immediately be related to any of the processes of the Administration itself but that are considered essential anyway are often handled by outsourcing them. Once the awareness grows that the activities have to be taken care of by the Administration itself (for instance because they are crucial within the framework of performing the core assignment) they are often in-sourced.

The Administration often chooses a project-approach as a standard method to take care of such implementations. However, once the activities grow more complex, thus making the results difficult or impossible to predict, the Administration chooses a program-approach to ensure solid implementation.

The Administration describes a program as a correlated set of important activities with a clear focus constituted of improvisations, routines, and target-aimed projects. Though the set of activities has a homogenous and ending character, when it comes to results the ending is unpredictable. Moreover, the complexity of the activities causes a program to last a couple of years. Which makes the content of a program liable to change due to the changing circumstances.

One of these programs was called ‘de Digitale Belastingdienst’ (the Digital Administration, i.e. the Digibel program). This program started in 1996. Digibel's focus was targeting by means of digital technology:

- to realise a customised information supply towards target groups, and individual and transactional communication[22] between taxpayers and the Administration;
- with a logical, interdependent relationship between information supply en transactional processing; including as few restrictions as possible to time and space and an adequate (meaning fast and digital) response of the Administration.

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21 Derived from the Annual Tax report 1998.

22 These are expressions as used by the Digibel program.

- realising a presence of the Administration within a digital society with a view to stimulating compliance en preventing fraud.
- realising an internal information service and communication structure, fitting the way in which external relations are taken care of.

The Digibel program was ended in January 2000. Its activities to achieve the objectives were transferred to a new organisational body called Belastingdienst / Centrum voor product en procesontwikkeling. (B/CPP - the Administration's centre for product en process development).

B/CPP was set up because of the desire of the Administration to strengthen the design level, an intermediary level between policymaking and strategy on the one hand and operations on the other hand. B/CPP's core activities are concerned with translating the Administration's policies into products and services[23].

At the same time, as the Digibel activities were transferred to B/CPP, the Administration's board granted B/CPP the assignment to develop a (new) vision on and concepts of a front office by means of preliminary research. The front office had to offer information, communication, and transaction service s using five different channels[24].

Five years earlier, on in 1995, the Administration's first web site had been published at De Digitale Stad (www.dds.nl). Actually, it was a one-on-one translation of the Administration's Videotex pages. Videotex was in its turn an expansion of Viditel, a service to business taxpayers delivered by the Administration since 1983 (From 1983 until 1985 as a subsection of the Ministry of Economical Affairs's Viditel section). From July 1996 the web site resorted under the Internet domain belastingdienst.nl. The operation of this web site was out-sourced and conducted at 'het Parlementair Documentatie Centrum' (PDC, parliamentary documentation centre). In its turn PDC had been outsourcing some Internet-related activities too. For example: interface design, server hosting and network connectivity.

By 1996 The Administration's board was convinced that the Internet in general, and the activities at PDC in particular, would become crucial within the next couple of years. As the general director J. van Lunteren put it in an interview on 10 September 1997:

*"We are convinced that the Internet has a surplus value. Therefore, we consciously chose to apply the Internet to support our organisation."*

The board decided that as many activities as possible had to be in-sourced. This was done by using a three-step model:

- First, move as many activities as possible from PDC to one of the Administration's organisational buffer zones: an innovation project organisation of the Administration: project organisation DIEC.

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23 Instelplan B/CPP, 2000.

24 Nota Front Office, August 2000.
- desk
- telephone
- mail
- electronic mail
- Internet (web site)

- Second, once implemented in DIEC, divide all activities into either technical or content related activities.
- Third, move all content related activities from DIEC to a staff organisation of the Administration that takes care of publishing, organisational advising and education (B/CKC) and all technical related activities from DIEC to the Administration's IT organisation (which was called B/AC then and will be called B/CICT in the near future).

DIEC had three major sections:
- Communication;
- IT;
- Electronic publishing.

At DIEC the EIO was a multi-disciplinary team grouped on the basis of one main discipline, which was editing. The EIO was fit into the section Electronic Publishing. The EIO consisted of a project manager, five team members specialised in either project leading or editing, and two team members specialised in webmaster activities.

All activities involving program writing were transferred from the EIO and concentrated in the IT section. All other web-site development activities such as web design, information retrieval and cognitive ergonomics were concentrated in the Communication section. Both IT and Communication sections were assigned activities concerned with innovations.

Within the EIO the following tasks were performed;
text editing;
- maintenance of the web site (upper and deeper levels);
- handling all web site-generated communication;
- codification (most editors could also perform a little program codification, such as filling data files with meta-tags in order to generate search results);

Another task, though less formalised, was related to transfer of the hosting of ….@belastingdienst.nl from an external partner to B/AC. This task was also assigned to DIEC - Section IT. However, section IT was strongly dependent on the ‘ready-at-hand-knowledge’ of a few members of the EIO. Therefore, section IT co-operated on a large scale with the EIO when it came to this specific task.

The bottom-line is that the EIO was daily involved in implementing and operating www.belastingdienst.nl, and hosting the e-mail features of …@belastingdienst.nl. Having the EIO as a research location granted direct access to all three major sections of DIEC and hands-on experience in all three stages of implementation, i.e. PDC, DIEC and B/CKC. Having the EIO as a research location provided a great opportunity for collecting sufficient tale-telling data showing what the effects are of a www.belastingdienst.nl and e-mail from and towards the belastingdienst.nl domain on the Administration’s organisational structure and its communication structure, while it also offered an opportunity to categorise these data.

Other possible locations were teams within the section IT or Communication. However, both sections were only involved in the implementation, not in the operations of www.belastingdienst.nl. Moreover, these teams were not involved in the implementation on a day-to-day basis.

## 2.4. Adaptation of initial aim and research units

On the basis of the initial research aim three separate research units were distinguished:
- Virtual front office.
- Organisational structure;
- Organisational communication structure.

To explore what influences an Internet-related, virtual front office has on an organisation's structure and its communication structure the characteristics of all three units had to be described. The proposed research characteristics were captured in chapter 1.2.2. However, first the research units had to be made applicable to the case study by transforming them into a more specific set of research units.
Subsequently, the research units in the case study were to be transformed as follows:
- virtual front office was transformed into www.belastingdienst.nl and …@belastingdienst.nl
- Organisational structure is transformed into the Administration's organisation structure.
- Organisational communication structure is transformed into the Administration's internal communication structure.

As a result of this transformation, the aim of research within the frame of this case study has to be adjusted:

Exploring the impact of www.belastingdienst.nl and …@belastingdienst.nl is on the Administration’s organisational structure and its communication structure.

## 2.5. Sampling methods

Although the research design was based on a single case study, sampling was nevertheless inevitable, given the size of this case - i.e. the Administration:
- Two out of three research units - the Administration’s organisational structure and the Administration’s communication structure - involved all divisions and departments of the Administration containing approximately 30,000 individual employees.
- The third research unit www.belastingdienst.nl was also fairly large in size if viewed from a certain point of view. Between 1996 and 2000 www.belastingdienst.nl counted a cumulative number of 37.517 files (HTML, GIF, and script files) that were archived within 2.908 directories covering about 367 megabytes.

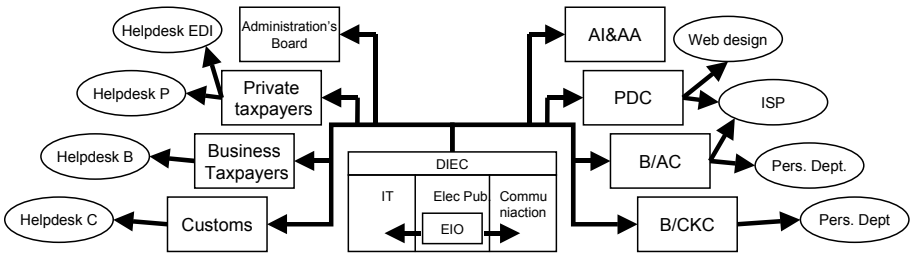
Two sampling stages were designed. The first stage served the exploration of what part within the Administration or its perimeter was related to the several adapted research units mentioned above- by conducting a *snowball sampling method*. The second stage served the observation of any changes over time in those parts within the Administration or its perimeter that were related to the several adapted research units - by conducting a *time sampling method*.

***Snowball sampling***

Every organisational department that was either formally or both formally and directly (i.e. those departments that performed the actual activities) involved in the operation or the implementation of one or more of the services of www.belastingdienst.nl or …@belastingdienst.nl had to be made explicit. Therefore, a selective, non-random method was required. This was achieved by applying the so-called 'snowball sampling' method. In this sampling method the sampling unit was an *organisational department*. The application of this specific method had to ensure that any department that was not formally involved in the operation or the implementation of one or more of the virtual front office services of www.belastingdienst.nl or …@belastingdienst.nl was deliberately left out of the sample.

The snowball sampling made three successive perimeters explicit concerning the implementation or operation of the services of www.belastingdienst.nl or …@belastingdienst.nl. The first perimeter and also starting point of the snowball-sampling was the EIO itself, because the EIO was literally the one and only key-holder to both www.belastingdienst.nl and …@belastingdienst.nl. The second perimeter considered all sections and teams that were part of DIEC and also involved in the operation or the implementation of either one of the services of www.belastingdienst.nl or …@belastingdienst.nl. The third perimeter considered all other departments and teams that were involved in the operation or the implementation of either one of the services of www.belastingdienst.nl or …@belastingdienst.nl.

The following picture shows the trajectory of the sample, which results in an overview of 20 departments that were either formally (10) or both formally and directly (10) involved in the operation or the implementation of one or more of the virtual front office services of www.belastingdienst.nl or …@belastingdienst.nl. Except for AI & AA those departments that were both formally and directly involved were all sub departments of several departments that were merely formally involved. The sub-departments performed the actual activities for the sake of www.belastingdienst.nl or …@belastingdienst.nl.




EDI – electronic data interchange
P - private taxpayers
B - business taxpayers
C - customs
AI&AA - Artificial Intelligence & Administrative Automation
PDC - Parliamentary Documentation Centre
B/AC - the Administration's centre for information and communication technology
B/CKC - the Administration's publisher and educational centre.
DIEC - the Administration's publisher project organisation for documentary information and electronic communication
B/CKC - Pers. Dept. - WsenL, the Administration's department that takes care of, among others, applications.

| Formally | Both formally and direct |
|---|---|
| Administration's Board | |
| | AI en AA |
| Private Taxpayers Division | Helpdesk P |
| | Helpdesk EDI |
| Business Taxpayers Division | Helpdesk B |
| Customs Division | Helpdesk C |
| PDC | ISP |
| | Web Design |
| IT - DIEC | |
| Electronic Publishing - DIEC | EIO |
| Communications - DIEC | |
| B/AC | Pers. Dept B/AC |
| B/CKC | Pers. Dept B/CKC |

As stated before, www.belastingdienst.nl contained a large number and a large diversity of files. However, neither the size nor the number of files give a clue to the construction and the accessibility of www.belastingdienst.nl, but the way these files relate to each other. To map this structure and simultaneously exclude structural parts of other domains on the Internet, the preferred method to analyse www.belastingdienst.nl is also the snowball sampling method. Namely, by using the information retrieval concept of www.belastingdienst.nl, which means starting at the homepage and then following the hyperlinks to several sub-front offices. Except for the so-called CCS[25] site, which was a 'hidden' site and not part of the upper level www.belastingdienst.nl hyperlink structure. However, the web address of this sub site was repeatedly printed in several documents especially for suppliers from the software industry

The snowball sample method made explicit which departments and teams had been and were involved in the operation or the implementation of one or more of the services of www.belastingdienst.nl or …@belastingdienst.nl and how this involvement took place on the one hand and it mapped the structure of www.belastingdienst.nl on the other hand. The result was a simplified overview of departments and teams directly related to either implementing innovations into or operating www.belastingdienst.nl.

The first conclusion was that all remaining departments were mainly involved in information or communication services. Few were involved in transaction services since it was merely TCP/IP related. Moreover, there were no distribution services provided by www.belastingdienst.nl. The second conclusion was that, although the content of www.belastingdienst.nl changed almost every day, the structure of www.belastingdienst.nl was rather rigid if it came to alteration or expansion[26] e.g. the number of (sub) front offices remained the same.

***Time Sampling***

The second stage had to serve the observation of any changes over time in the organisational and internal communication structure and www.belastingdienst.nl and …@belastingdienst.nl. The snowball sample already explicated that there were 10 organisational departments that were

25 Centraal Coördinatiepunt Softwarehuizen

26 For instance, between 1997 and halfway 1998 3 entries to sub levels offices were added:
- working at the Administration
- hyperlinks to the Ministry of Finance
- ….and the Tax and Customs Museum

both formally and directly involved in www.belastingdienst.nl and …@belastingdienst.nl. It was impossible to permanently monitor every single one of these organisational departments. This could only be done in case of the Editorial Internet Office, namely by participant observation (see chapter 2.6.2.). With regard to the other 9 organisational departments, a second selective, non-random sampling method had to be deployed, namely *time sampling*. In this sample the sampling unit was a period of time, namely a three-month-period. The sample was carried out for a period of two years; 1998 and 1999, i.e. there were 8 samples. Every sample implied conducting half-structured interviews. (see chapter 2.6.3.). The other, merely formally related departments were left out of the second stage sample since the departments that were both formally and direct related were all sub departments of the merely formally related departments. Any changes in the sub departments with regard to the virtual front office would also concern the merely formally related departments, and vice versa. Except for AI & AA, which was treated as a sub department and therefore included in the time sample.

With regard to the changes within www.belastingdienst.nl and …@belastingdienst.nl the sampling unit was also period of time, namely a six-month-period. This time sample was carried out for a period of two years; from 1998 to 1999, i.e. there were 4 samples. An extra, final, single sample was taken in 2002 in order to check if there were any changes right before this dissertation was closed - see chapter 4.1, answering research question 4B.

***Important notice***
Because of the program-approach of the Administration research and development activities were never part of the Administration's going concern. Such activities were performed in so-called pilot projects. Consequently, organisational units in which the pilot projects[27] were carried out that handled research and development related to web and e-mail technologies were excluded from the snowball sampling. As a result, they were also excluded from the time sampling.

## 2.6. Data collection methods

This chapter captures the methodological account with regard to the selection of data collection methods (2.6.1), and it provides background information on how the several methods were handled. (2.6.2 to 2.6.4).

### 2.6.1. Methodological account

Qualitative research focuses on maintaining the situation to be researched. No special or isolated circumstances are to be created, since its focus is to create a clear and complete image of the existing situation. It follows that the data collection methods should also focus on not disturbing the situation, meaning that they have to be:
- open to any topic or order of topics

. . . . . .

27 There were two relevant pilot projects. The first in Rotterdam: exchange between one unit and one tax-consulting bureau, the second in the north-west of the Netherlands

- flexible in application
- little standardised and structured
- supporting role-switching
- … and intense contact between research and the situation that is to be researched[28].

Baarda, de Goede and Teunnissen (1997) put forward three different types of methods to apply, namely:
- participant observation - to be applied whenever certain behaviour is to be studied.
- interview - to be applied whenever ideas, visions, opinions on a certain situation etc. are to be studied.
- retrieving documents - to be studied whenever concrete results are to be found.

Within this case study criteria for selecting methods were derived from the aim or research's underlying central research questions. Since they consist of 'yes-or-no questions' that try to find out whether something did happen or not, retrieving documents seemed to be the most appropriate method to apply. However, the activities to implement the hosting of www.belastingdienst.nl and …@belastingdienst.nl into the Administration started at almost the same time as this case study started. At that time, there were only few documents, which automatically meant a certain risk to the research's reliability. Because of this risk, participant observation had to be applied too.

The research location gave the opportunity to perform several roles. All these roles enabled daily access to activities concerned with the implementation of the hosting of www.belastingdienst.nl and …@belastingdienst.nl in the Administration.

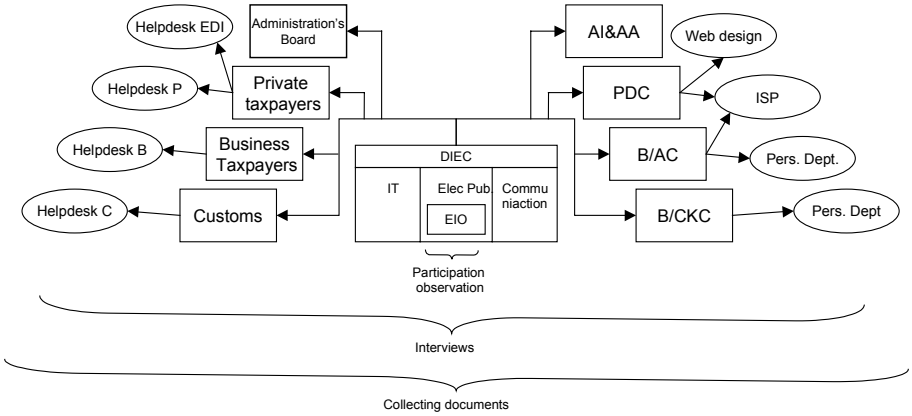
However, there were two restrictions on the accessibility to the case because of role-playing. The first restriction was that performing a role as a member of the EIO was also proof of not being a member of any department or group that bordered on the EIO. Consequently, performing such a role outside the context of the EIO, i.e. as a member of one of the bordering groups or departments, was impossible. Therefore, not only participant observation was applied but also conducting interviews as a data collection method.

The second restriction of the accessibility lies in the fact that it was not possible to play the role of a manager in the Administration. This was a denial of access to any data concerned with how management behaved while handling the implementation. Therefore, not only role-playing but also 'interviews' were used as a data collection method.

The above is captured in the following picture.

. . . . . .

[28] Baarda, de Goede, Teunnissen.




The final results are captured in chapter 3.

### 2.6.2. Participant observation

The participant observation period lasted from the beginning of 1997 until halfway 1998. The observation can be characterized as 'observer as participant'. The research location granted the opportunity to perform several roles five days a week during a year and a half, namely as one of the:

- the project leaders within the EIO concerned with transferring (one of) the (sub) virtual front office(s) from PDC to DIEC.
- technical advisers to DIEC, B/CKC and B/AC.
- EIO members who had to document all web site related activities and technologies
- EIO members who handled web site related e-mails.

***Project manager***
In January 1998 a new version of the so-called 'declaration web-site' had to be released that supported income declarations for private taxpayers over the year 1997.

Up to that moment all activities concerned with www.belastingdienst.nl including the 'declaration - site' had been operated by PDC. The preparation of the transfer of these operations started in the summer of 1997. The preparation included analysing and planning activities related to several operations such as editing tax related topics, web-site design, upload procedures and archiving the 1996 'declaration web-site' for the use of the public.

The actual transfer was achieved in January 1998. It was also one of the first web site releases the Administration operated itself. The complete transfer of all of www.belastingdienst.nl was formally completed the moment the EIO's activities were transferred from DIEC to B/CKC halfway 1998.

***Technical adviser***
In co-operation with the IT section, the technical advisor had to give technical advice on the selection of software, hardware and network connectivity related to the hosting of www.belastingdienst.nl and …@belastingdienst.nl.

***Documenting***
Before transferring operations from DIEC to B/CKC every activity related to operating www.belastingdienst.nl and …@belastingdienst.nl had to be documented in order to save this knowledge for future members of the EIO.

***Handling e-mail***
In handling web site related messages the EIO worked in shifts. Once a fortnight every member of the EIO had to handle the message-load of one single day, which could increase from handling fifty up to a hundred messages.

Performing these roles, which all dealt somehow with the transfer of operating www.belastingdienst.nl and …@belastingdienst.nl., meant that a complete overview was granted to all possible departments or groups that were related to www.belastingdienst.nl.

A topic list[29] was made and used as a guideline for collecting data and preparing the data for analyses. The observations had to concentrate on the changes in the organisational structure and the communication structure related to the EIO from 1997 to halfway 1998. Subsequently, the topic list focussed on detecting design variables and on vertical, horizontal, and diagonal communication flows. The topic list is to be regarded as a prelude to a possible set of categories that enables the description of the impact of the Internet on organisational structures and the communication structures that support them.

Relevant observations were put on paper. Relevance was determined on the basis of first encounter, historical relationship or background, possible or planned changes related to each topic.

For example when handling e-mails the topic is communication services: Y indicated that he is looking for information on tax regulations related to company cars but he somehow has difficulties in finding it on www.belastingdienst.nl. I reply while including an exact URL and an excerpt.

### 2.6.3. Open interviews

Two different kinds of open interviews were conducted throughout the research period, namely free-attitude and half-structured interviews. The interviews were conducted from 1997 until halfway 1999. The free-attitude interviews were conducted with all team members of the EIO, and with all team leaders and several members of the units presented in the time sample. The free-attitude interviews were conducted when one or several of the topics handled during the participant observation was ‘encountered’ while merely performing participant observation was not sufficient because of accessibility restrictions.

The free-attitude interviews were never planned and they were never introduced as such. They were conducted whenever it was relevant. Role-playing was used as a practical background to pose a question. Relevance was determined by:

. . . . . .
[29] See also chapter 2.7

- *historical relationship or background*, for instance while documenting to an EIO colleague ‘When did we stop handling these specific types of questions on tax regulations related to company cars and started forwarding them to the Private Taxpayers helpdesk?
- *possible or planned changes*, for instance as a project manager to the Digibel program manager ‘When is electronic clarification via our web interface due for implementation and what features may it contain?
- *clarifying a situation observed*, for instance, being technical adviser to a manager at B/CKC: ‘Why is the PDCSNS-script still in use?

In contrast to the free attitude interviews the half-structured interviews were planned. Half-structured interviews were performed as part of the time sample and in order to improve the internal validity of the data-collection. The latter contributions were used in order to check whether the results and conclusions collected so far, were also acknowledged by the ‘Administration’ as a formal body. These interviews were conducted with key persons that had a formal and top-down relationship to the EIO:
- the general manager of the Administrations
- head of communications of the Administration
- account manager at PDC
- general project manager at DIEC

### 2.6.4. Collecting documents

Four types of documents were collected from the beginning of 1997 until 2000.
- white papers
- green papers
- reports
- archives.

The criterion for collecting a copy of any such document was the fact that its topic had to be Internet related. Such documents were collected from within the Administration itself and from its environment.

Within the Administration locating the documents was part of the free-attitude interviews. During a free attitude interview someone either related to a document or an interviewee was asked if he or she was aware of any document on this subject.

## 2.7. Registration and documentation of the data

In order to document the data in a clear fashion, and making sure that changes over time would become explicit, the collected data were registered according to period and by using a labelling system derived from the research units, namely
- www.belastingdienst.nl:
  - information services
  - communication services
  - transaction services
  - distribution services
- organisational structure:
  - strategic variables

    - design variables
- communication structure:
    - vertical flows:

    *downward communication*
        - instructions
        - explanations that guide instructions
        - procedures en practices (policy, regulations, etc.)
        - feedback
        - indoctrination of goals (or better: awakening) .

    *upward communication*
    - information on the performance of the organisation itself, like financial specification, turnover, time registries, et cetera: the so-called management information
    - ideas of co-workers on work and policy
    - feedback on downward communication.
- horizontal flows
- diagonal flows.

A most important target for the members of the EIO was to standardise their single working processes for future use. Therefore, as a matter of principle (approach) and practice (privacy) in this case study the research characteristics were drawn from a theory - i.e. the *process contingency approach*, see chapter 1.2.1 - which doesn't consider *standardisation* to be part of the structural level but the individual level.

The sections below provide information on how each method was performed and it captures examples of how the labelling system was handled per research method (2.7.1 to 2.7.3).

### 2.7.1. Participant observation

The next two fragments show examples of how notes were put down during the participant observation and labelled in line with the research characteristics. The first note is about a script that provided certain features of www.belastingdienst.nl. For instance the handling of web forms. The other was taken while handling e-mails.

***Example note 1:***
"In order to communicate, interact, and generate user statistics via the Administration's web-sites PDC developed a certain script. This script is easy to handle for PDC program writers, as they wrote it themselves. However, the script is handed over to us (…EIO) without any documentation. Every instant an error occurs (as the script is not always compatible with other software on the web-server) and when a new feature has to be added, we have to contact a program writer at PDC in order to have the script adjusted. The absence of any documentation prevents us from adjusting the script ourselves."

This note contains two different labels - both width and depth of Functionalisation. Therefore, this note was divided into two excerpts.

Excerpt 1: "In order to communicate, interact, and generate user statistics via the Administration's web-sites PDC developed a certain script. This script is easy to handle for PDC program writers, as they wrote it

themselves. However, the script is handed over to us (…EIO) without any documentation.

This excerpt is labelled twice with ‘depth of Functionalisation’. First of all because the program writers of PDC developed and operated it, i.e. both activities were part of their task. Secondly, because the script automates several activities, thereby excluding them from ‘manual’ tasks of the EIO.

Excerpt 2: “Every instant an error occurs (as the script is not always compatible with other software on the web-server) or when a new feature has to be added, we have to contact a program writer at PDC in order to have the script adjusted. The absence of any documentation prevents us from having the script adjusted by our (..of the Administration) program writers.”

This excerpt is labelled ‘width of Functionalisation’, because it shows that a competency ends (editing) and an activity (adjusting a script) has to be transferred to the competency (program writing) of someone or something else.

***Example note 2:***
Today it was my turn to handle e-mails. There were 54 messages in the mailbox. Most of them were comments on www.belastingdienst.nl. Only a few were concerned with technical problems caused by browser versions that didn’t support a new JavaScript. I guess all problems were either solved or taken for granted, since no one returned an answer, …yet.

This note is labelled ‘communication service’. It indicates how e-mailing with users is carried out.

### 2.7.2. Open interviews

The open interviews consisted of both free attitude interviews and half-structured interviews.

***Free-attitude interviews***
Often, the free-attitude interviews complemented the participant observation method. They took place, for example, while performing the role of technical adviser and having the objective to replace the PDCSNS-script:

Question: What features does this script have?
Answer: This script handles, among others, the dumping of forms that enable users to order brochures by collecting the output in one single file.

This note is labelled twice. First of all it is labelled ‘information service’. It is explained how information can be retrieved from the Administration. Second, it is labelled ‘depth of Functionalisation’. Because the script automates several activities, i.e. excluding them from ‘manual’ tasks of the EIO.

***Half structured interviews***
The half-structured interviews partially concentrated on increasing the validity of the notes that were made via both participant observation and free attitude interviews. In those cases excerpts were handed over for approval or comments on how they reflected the situation. If a situation was unrecognisably reflected according to the interviewee then the situation

would be discussed until agreement had been reached. Subsequently, a new or adjusted reflection would be put on paper.

### 2.7.3. Collecting documents

Within the Administration the following documents were collected:
- BelastingInformatie, structuurschets voor de elektronische informatiedienst (1995), Den Haag: Ministerie van Financiën
- Program document “Digitale Belastingdienst”, 1997 - 2001
- Program document “Digitale Belastingdienst”, 1998 - 2002 (April 1997)
- Inrichtingsplan Beheer digitale producten (1998) Utrecht: Belastingdienst / centrum voor kennis en communicatie.
- Program document “Digitale Belastingdienst” 1999 – 2003 (march 1998)
- “Positioneringsplan Internet” 1999 (version 0.7, dated January 1999)
- Annual Tax Report 1999
- Handboek organisatie en formatie, Versie: 1e Publicatie, Suppl. 1 - Datum: 1 februari 1999
- The electronic archive of www.belastingdienst.nl consisted of html, .gif and .jpg files, covering all versions of the (sub) front offices from 1996 to 2000 of www.belastingdienst.nl. Labelling was carried out per sub front office.

These documents were all screened for items that came from the list of characteristics. For example, when screening the program document “Digitale Belastingdienst”, 1998 - 2002 (April 1997) for the topic organisational environment the next excerpt was found:

*“The objectives (of the program...) align with a trend in society in which flexible services are provided at any time via any media.”*

The words ‘in society’ relate to the organisational environment; the Administration faces an environment in which flexible services are provided at any time via any media.

In the first chapter four services were distinguished that an organisation can offer in order to raise the value of a product. The constitution of these services may give a clue to the impact the services at www.belastingdienst.nl have on the Administration. Therefore, before labelling the several services of www.belastingdienst.nl the product had to be determined first. A lead was found in the Administration’s duties. These include levying and collecting taxes, auditing bookkeeping systems and investigating fraud. In order to perform the first two duties the taxpayer has to be able to perform his duties. He has to be able to declare for example his income or turnover. This lead has to combined with the DigiBel program, which was targeting by means of digital technology:
- to realise a customised information supply towards target groups, and individual and transactional communication[30] between taxpayer and Administration;
- with a logic interdependent relationship between information supply en transactional processing; including as few restrictions as possible to

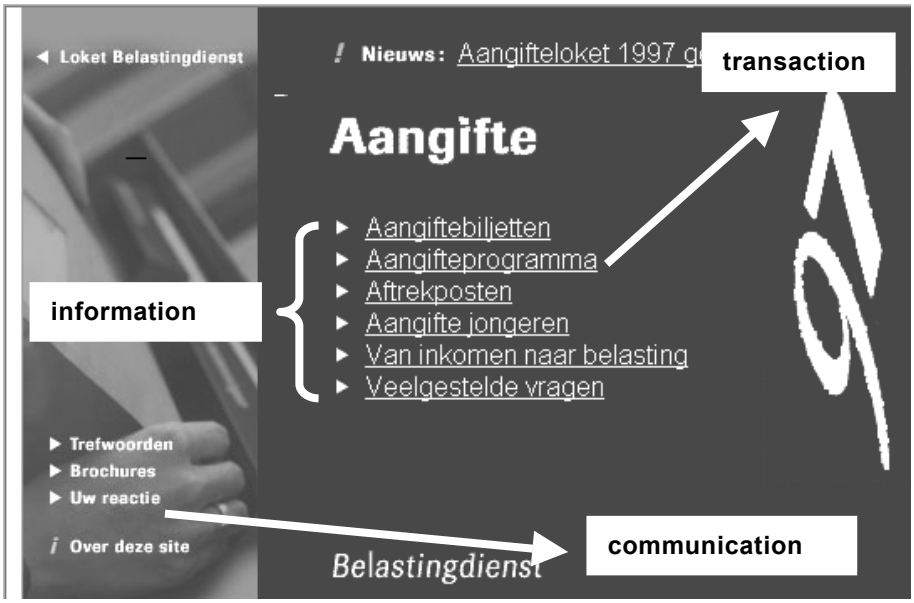
. . . . . .
30 These are Digibel expressions.

time and space and an adequate (meaning fast and digital) response of the Administration.

On the basis of the first two duties and the DigiBel program it is legitimate to assume that the Administration's virtual front office supports a specific transaction between the Administration and the taxpayer in order to levy and collect taxes, namely declaring taxes. Following this argument, the services at the Administrations virtual front office support a specific product, namely tax declaration.

A labelling example is listed below. The sub front office 'Private Taxpayers' was labelled with three services:
- information (veelgestelde vragen = information on declaration forms, the declaration software, frequently asked questions, etc)
- communication (uw reactie = your comment)
- transaction (aangifteprogramma = the downloadable declaration software).

These services could be mapped as follows:




### 2.7.4. Documentation

After the data had been registered and labelled they had to be captured in an orderly fashion in order to create an overview of what the impact of www.belastingdienst.nl and …@belastingdienst.nl was on the Administration's organisational structure and its communication structure. Therefore, the data were structured in line with the research units on the one hand and then presented in chronological order on the other hand. The total period was divided into three periods:
- 1995-1996 was referred to as the PDC-period
- 1997-1998 was referred to as the DIEC period
- 1999 was referred to as the B/CKC period.

## 2.8. Analysis of the data collection

As mentioned in chapter 2.2.1 the analysis of the data collection had an impact on the research design and on the tentative hypotheses that were used in the explorative stage of this research. The explanation for this can be found in two fundamental basic assumptions at the start of this research. First of all, it was assumed that if communication is accommodated by new or transformed channels and media, and ways of notifying meta-communication and the relational aspect of messages, then a change within the processes of communication cannot be prevented. This is clearly the case with Internet communication media. The second assumption was that communication provides organisational structures. Therefore, altered communication leads to an alteration of the structural relationships within a group. These assumptions led to the next set of tentative hypotheses:

- After the introduction of Internet communication media the internal communication flows and therefore the internal communication structures of the organisation start to change.
- Once the internal communication structures change due to the introduction of virtual communication media, the organisational structures start to change too.

However, the data collection didn't provide sufficient data to adopt these tentative hypotheses. Although Internet communication media were introduced into the Administration and taken into operations by hosting www.belastingdienst.nl and …@belastingdienst.nl, the communicational structure and the organisational structure of the Administration only changed marginally.

In the context of the high expectations during the mid- and late nineties, this was a surprising conclusion. In that it was widely expected that the Internet boom would inevitably lead to a global shake-up. Negroponte, for example, wrote:

*"The middle ground between work and play will be enlarged dramatically. The crisp line between love and duty will blur by virtue of a common denominator--being digital. "( Being Digital 1995, p. 209 Dutch edition):*

More recently, Don Tapscott, one of the authors of Digital Capital, wrote on his web site www.dontapscott.com:

*"…the Net is not about creating a great web site, spinout, portal, or dotcom. It is an infrastructure that is changing the way cars are built, gas is distributed, the nature of banking and even money itself."*

As mentioned before, this slightly surprising conclusion became a trigger that changed the type of research by adding a new challenge, namely finding a potential causal relation, to the original explorative dimension captured within the aim of this research. I.e. after the data showed that there was only a single change, which was then consolidated, it was decided to analyse the data again by developing a final set of hypotheses.

A lead was found in what Heijnsdijk calls the 'management-filter'. His process contingency theory states that 'viable' organisations are shaped by

ideal fits between three dimensions: the organisation's environment, the organisation itself and the individuals within the organisation. Management handles these three dimensions using strategic, design, and control variables. However, the dimensions are liable to change. Therefore, management has to alter the three variables permanently in order to maintain the dimensions in a fit. The speed at which an organisation tunes its variables to the ever-changing dimensions depends on the 'thickness' of its management-filter. The 'thicker' a management-filter, the slower organisations alter their variables to cope with impulses from its surroundings, its organisation and the individuals.

However, access to the Administration's management was restricted. So there were no reliable data available that referred to the relationship between the 'thickness' of the Administration's management-filter and the little influence the Internet had on the Administration. Therefore, it was decided to design a meta-theory that could provide the answer to why the data collection showed such little change, by using the idea of 'thickness of a management-filter' as a starting point: If a management-filter somehow produces an effect on the flexibility of the design variables, or better the organisation's structure, then it is the organisational structure itself that somehow determines whether or not the Internet can produce an effect on an organisation.

Lawrence and Lorsch (1967; 1986) proposed that organisations must balance differentiation and integration to be successful. As such they implicitly indicated that the flexibility of an organisational structure to a large extent determines whether or not an organisation successfully 'survives'. However, their proposals were, obviously, produced without taking what was assumed structure-disruptive interactive Internet-based communication into account. Whereas in the light of organisational communication, communication technology has to be considered a fundamental part, and studies of technology should explicitly consider the role of organisational context. (Taylor, et.al, 2001)

At this point Maturana and Varela's theory came into play. Their findings acted as a source of inspiration to tackle the problem of having tentative hypotheses that could not be adopted. Their findings were adapted and transformed into a meta theory and merged with Winograd and Flores', and Turkle's findings into a theoretical background as captured in chapter 1, it suddenly became clear that the phenomenon of interaction between an organisation and its environment leads to structural changes, instead of merely introducing new means of communication such as electronic mail. And that - as an analogy to implicit indications of Lawrence and Lorsch's proposals - it is an organisational structure that determines the ability to adapt to its environment and therefore conserve its organisation. Within this framework communication provides the structural relationship within a group and between a group and its environment, especially by channels and media, meta-communication and the relational aspect of messages. So if a group adopts Internet communication media, it starts interacting with what is called the Digital World by creating a structural relationship with the Digital World. From that moment on it may receive perturbations from the Digital World. These perturbations may trigger changes in the structure of the group.

I took into consideration that at the turn of the century for instance electronic banking via a web interface had become very common. In other words,

many organisations had successfully adopted the new concepts and the new technologies of the Digital World. Therefore, I took Hill, Fehlbaum, and Ulrich (1998) into consideration. They make a distinction between two extreme organisational constellations, or ideal types, on the opposite ends of a sliding scale. Constellation type A is concerned with a high potential for routines and a low potential for problem solving. Constellation type B is concerned with a low potential for routines and a high potential for problem solving.

I finally transformed the two tentative hypotheses into what eventually became the fifth hypothesis:

*An organisation that implements its virtual front office services into its organisation by applying variables that tend to type A, is hesitant to create a full structural coupling with that particular Virtual Space of the Digital World that covers the domain of its core business the most.*

Next, a final set of hypotheses was drawn up, as chapter 1 describes, and transformed into a final set of research questions:

1A Does the Administration's strategic apex decide to create a channel to the Digital World because it wants to carry out the Administration's mission as effectively as possible?

1B If so, does the Administration's strategic apex do this as soon as it observes that the organisation's regular environment is turning to the Digital World?

2 Is the Administration able to create a structural coupling with the Digital World by implementing a virtual front office?

3A Does the Administration, in order to maintain its structural coupling with the Digital World, aim to adapt its virtual front office?

3B If so, does the Administration do this as soon as it observes that one or more of the four Virtual Spaces that it is connected to starts to change?

4A Does the Administration more and more connect the structural coupling(s) provided by its virtual front office to its organisational structure by applying variables that tend to type A?

4B If so, does the Administration's virtual front office become less adaptable?

5A (=4A) Does the Administration more and more connect the structural coupling(s) provided by its virtual front office to its organisational structure by applying variables that tend to type A?

5B If so, is the Administration hesitant to create a full structural coupling with that particular Virtual Space of the Digital World that covers the domain of its core business the most?

*6A Does the Administration's organisational structure change when its virtual front office provides communication services?*

*6B Does the Administration's internal communication structure change when its virtual front office provides communication services?*

7A (=4A) *Does the Administration more and more connect the structural coupling(s) provided by its virtual front office to its organisational structure by applying variables that tend to type A?*

*7B If so, does the virtual front office provide a structural coupling with the Virtual Communication Space?*

*7C If so, does the virtual front office increasingly focus on controlling communication flows with the Virtual Communication Space?*

The sampling (see 2.5) only took those organisational units into account that were involved in the implementation or the operation of one or more of the services of www.belastingdienst.nl and …@belastingdienst.nl, the Administration as a whole was excluded from the case study. Consequently, no data would be gathered to answer what type - A or B - of organisation Administration is.

The answers to these questions related to the data collection as captured in chapter 3 are presented in chapter 4.

***Important notices***

As already mentioned, as a matter of principle and practice the research characteristics were drawn from the process contingency theory. However, the data were amongst others analysed based on the variables as put forward by Hill, Fehlbaum, and Ulrich (1998). This could easily be done because the variables within the process contingency theory were amongst others drawn from the theory of Hill, Fehlbaum, and Ulrich. However, the process contingency theory for a great deal uses different names. The table below shows how to match the variables that constitute the organisational structure (1-5) within the process contingency theory plus the standardisation variable (6) with the variables as put forward by Hill, Fehlbaum, and Ulrich (1998).

| Process contingency theory | Type A/B variables |
|---|---|
| 1 Horizontal division of tasks | 1 (De)centralisation |
| 2 Horizontal (de)centralisation | 2 Functionalisation |
| 3 Delegation | 3 Delegation |
| 4 Functionalisation, depth | 4 Participation |
| 5 Functionalisation, breadth | 5 Separation |
| 6 Standardisation | 6 Standardisation |

Notwithstanding the fact that it wasn't a research characteristic, chapter 4.1. will show that it was still more or less possible to analyse the data for standardisation.

## 2.9. Validity

***Internal***
To increase the internal validity of this dissertation, a derivative of the Delphi-method was used[31]. Four persons checked the documented data. They could be considered key persons because all four took part in the implementation and operation of www.belastingdienst.nl and …@belastingdienst.nl.

After the data had been analysed and captured within a document the first person received a copy of this (Word) document in order to give comments on it. The document had a second attached to it. The second document explained what the structure of the data document was and notified that the nature of the comments should be whether or not they approved of the situation as captured from their point of view. The document requested to write down the comments within the data document.

All comments of the first person were collected and processed within a new document. This altered document was then given to the second person who added his or her comments. These comments were collected and processed in a third version and so forth and so on.

The order in which the persons received a copy was picked at random. The documents were sent by e-mail. It took every person about a week to read and comment on the document.

The four key persons were the commanding customer's (Private Taxpayers Division) representative, the general project manager of the project organisation DIEC, the account manager at the PDC and a member of the EIO.

Examples of their comments were for instance:
- Call back services were introduced during the PDC-period, not the DIEC period.
- You forgot two information elements of the Business Taxpayers front office.
- Please add 'information advisor' to the skills during the PDC period.

Another fact that increased the internal validity was a conference organised at the Administration in January 2001. Several key-players of the Administration attended this conference. They conferred on the subject of 'front office processes and transaction services'. A memo based on this conference captures the next statement, which supports the data collection as captured in chapter 3.

"In order to produce any objective for an electronic Administration (e-Belastingdienst) it is necessary to pinpoint at what development level or maturity level the Administration is…. For this use the memo refers to the

. . . . . .

[31] The Delphi method usually consists of a series of repeated interrogations, usually by means of questionnaires, of a group of individuals whose opinions or judgements are of interest. After the initial interrogation of each individual, each subsequent interrogation is accompanied by information regarding the preceding round of replies, usually presented anonymously. The individual is thus encouraged to reconsider and, if appropriate, to change his previous reply in light of the replies of other members of the group.

‘Enabling e-Government’ model of Gartner Research. This model defines four phases:
1 presence
2 interaction
3 transaction
4 transformation.”

…a conclusion that is drawn from this memo is that with regard to operations of the Administration within the framework of the Internet-channel (i.e. www and e-mail) the Administration for a great deal still remains in the first phase and only performs experiments and pilots in de second phase (e-mail) and third phase (pilot LB/OB = transaction pilot). However, the bottom-line is that the Administration's Internet-related front office presence, i.e. providing a Virtual Information Space for information services, is still the most important objective.

***External***

A disadvantage of conducting a case study that is often referred to is that it remains open whether or not the hypotheses that are tested, and adopted or rejected, also apply to other cases. However, the external validity of a case study can be accounted for as long as the research situation concerned is similar to other situations (Baarda and De Goede, 1997). Such a condition requires that the Administration is not an isolated case. This condition is fulfilled once it is clarified that the Administration has certain characteristics that are similar to other cases.

There are three potentially relevant characteristics of the Administration:
1 The Administration is a government service that supports the executive.
2 The Administration is struggling with the improvement of its existing virtual front office services.
3 The Administration aims at a customer-oriented approach, or as some would say: a citizen centric approach. In this the Administration faces a certain tension. Because, despite being a customer oriented government service the Administration also aspires to enforce legal security and equal justice in all cases. That means that it has to reduce uncertainty, which, according to the theory that is to be tested in this dissertation, means it will have to apply a less flexible organisational structure. However, aiming at a customer-oriented approach implies that the Administration has to adapt to a changing organisational environment; that is where the customers are. This is putting greater demands on the organisational flexibility since the Administration faces an organisational environment that is becoming more complex, dynamic and diverse (Bedrijfsplan Belastingdienst, 1999 - 2003),

The following account shows that the Administration shares these characteristics with many other potential cases.

With regard to the first characteristic: The very number of national, regional and local government services that support the executive if only in the Netherlands is over 1500 (Internetmonitor Overheidswebsites 2000).

With regard to the second characteristic the following observations are made:

- In 2000 Accenture started an investigation[32] in 22 countries on the difference between the ambition captured in government programs and the actual implemented virtual front office services of governments. Accenture found that the majority of governments were only publishing information on the Internet, and had not yet progressed up, what Accenture refers to as, the online maturity curve. (According to Accenture at the end of the online maturity curve lies providing communication services and finally transaction services). The 2001 round of Accenture's research found evidence that governments are moving up the maturity curve, but still have a long way to travel to reach full online maturity. (Accenture, 2001) Both facts, ambition on the one hand and not yet fully implemented virtual front office services on the other hand, show that next to the Administration a lot of government services are struggling with the improvement of their virtual front office services.
- In its investigation Accenture also found that in countries that have the highest maturity level with regard to online services, the online services of the revenue services were the least mature. This finding is explicitly supported by a statement of official delegates of several revenue services. In written contribution of the 2001 advanced Roundtable on Tax Applications to the eGovernment Conference "From Policy to Practice" in (Eymeri, 2001) civil servants from several EU and a few non-EU States revenue services have agreed on the following overall statement: e-government applications in the field of taxes are still at their beginnings. Projects being still in their first phase of implementation. The delegates add that it is too early to make a comprehensive assessment of their successes and failures[33].
- The first annual survey of government websites conducted by the World Markets Research Centre and Brown University in 2001 also shows that governmental bodies are, as Accenture refers to, at the beginning of the maturity curve: 73 % of 2,228 government websites in 192 countries feature e-mail services that enable citizens to pose questions or request information or services in general. But only 6 % of all government sites allow citizens to register to receive e-mail updates regarding specific issues. Among the websites examined in Europe, only 9% offer services that are to be fully executed online, i.e. transaction services. In other words some 91% have no transaction services.

As for the third characteristic: More and more government organisations seem to pay attention to the subject of improving the relationship with citizens in their role of customers of the government (Duivenbode, 2002). Many governments in Europe are focussing on a citizen centric approach. New forms of steering the public administration are being implemented as an answer to the rising complexity of the societal environment. However, according to some observers the government is advancing too slowly with regard to becoming citizen centric (Albeda and Bijlert, 2001).

In conclusion, the above shows that many governmental bodies share the three proposed characteristics with the Administration. They are:
- government services that support the executive
- struggling with the improvement of their virtual front office services

. . . . . .

32 eGovernment Leadership, Rhetoric vs Reality - Closing the Gap, 2001.

33 Note that, at least as it comes to the revenue services, this addition also supports the relevance of this dissertation.

- aiming at a customer oriented approach.

Nevertheless, it goes without saying that for the reason of applying a single case study, the hypotheses that are developed within this investigation are to be tested on other cases with characteristics as listed above. However, it was not the primary intention of this research to reject or adopt hypotheses that are generalizable to a great many cases. Instead, this research, as the aim of research indicates, should be considered an exploration and a starting point in order to eventually find out what the impact of the Digital World on organisations is. The theory and the hypotheses that have been developed in this investigation will have to be tested in future research, at least on cases with similar characteristics to the Administration, see chapter 4.4.

# 3. Results

This chapter contains a summary of the data collected during the research period. The data are labelled in lineage with the characteristics of the three research units:
- virtual font office - 3.1
- organisational structure - 3.2
- communication structure - 3.3.

## 3.1. Virtual Front Office

In 1995, the Administration's first web site had been published at De Digitale Stad (www.dds.nl). Actually, it was a one-on-one translation of the Administration's Videotex pages. Videotex was in its turn an expansion of Viditel, a service to business taxpayers delivered by the Administration since 1983 (From 1983 until 1985 as a subsection of the Ministry of Economical Affairs's Viditel section). From July 1996 the web site resorted under the Internet domain belastingdienst.nl. The operation of this web site was out-sourced and conducted at 'het Parlementair Documentatie Centrum' (PDC, parliamentary documentation centre).

The Administration's upper level virtual front office (the homepage of http://www.belastingdienst.nl) directed users to a deeper level, i.e. the virtual front offices of the:
- Private Taxpayers Division (Particulieren);
- Business Taxpayers Division(s) (Ondernemers);
- Customs Division (Douane).

These deeper level front offices were target group oriented, meaning that they were meant to serve:
- Private Taxpayers;
- Business Taxpayers;
- Private or business entities that get involved with Customs.

Besides these deeper level front offices there were three special sites at www.belastingdienst.nl. Since 1996 the upper homepage contained a hyperlink to a special (job)site referred to as: ‘apply for a job’ at B/AC. In 1997 a special site for youngsters was introduced at the Private Taxpayers front office: *Jongerenloket*. In 1998 the upper homepage was extended by adding ‘applying for a job’ at the Administration as a whole (werken bij de Belastingdienst).

There were two hyperlinks to virtual front offices of other organisations:
- The Ministry of Finance (Ministerie van Financien);
- The Tax and Customs museum (Belasting- en Douanemuseum).

None of the virtual front offices (main and deeper levels) offered the possibility to construct so-called 'user profiles'.

The available statistics show a significant increase in the number of page views[34] on www.belastingdienst.nl/index.htm:

| Year | **Number of page views on home page** |
|---|---|
| 1996 | 50,000 (app.) |
| 1997 | 404,620 |
| 1998 | 1,822,057 |
| 1999 | 3,277,857 |
| 2000 | 3,471,320 |

Another important observation was that there were almost no personal e-mail accounts and addresses within the domain 'belastingdienst.nl' published at www.belastingdienst.nl. The only way to e-mail the Administration was via those e-mail accounts that were activated by several web forms. Besides, in 1997 there were about 17 employees in the Administration who had a personal account within the domain belastingdienst.nl. But these addresses were not made public.

The Administration four categories of supporting services (as distinguished in the chapter 1.2.2) at its virtual front office:
- information services;
- communication services;
- transaction services;
- distribution services.

The services are described, per period (PDC, DIEC and B/CKC), in detail below.

34 Although it does give a good impression on the rate of expands, the number of page views doesn’t exactly cover the number of visitors.

### 3.1.1. Information services

***PDC – Period***

'The home page'

At this level the next elements contributed to the information services:

- *News*: any news that is in the public's interest was published here.
- *About this site*: Where users could get answers to questions like: 'What can I retrieve from this site, how does it work, etc?'
- *About the Organisation*; general information about the Administration

The second element and the third element were rather static. They were never or only once in a while changed or updated. However, *News* was published at monthly intervals, except during the so-called declaration period[35] - from January to the end of March. During this specific period news was published at the sub front office for Private Taxpayers at two-week intervals.

Search engine: In order to find information in one or all of the virtual front offices visitors could make use of a so-called reference-based search engine.

Private Taxpayers

In 1995 the 'Private Taxpayers' virtual front office was introduced as a section of the Digitale Stad (www.dds.nl). The other offices were introduced in 1996.


. . . . . .

[35] During this period private taxpayers are invited to declare their income.

From the beginning the virtual front office for Private Taxpayers contained the following elements:
- commentaries on declaration forms (toelichting bij aangifte)
- commentaries on changes of tax legislation (wijzigingen)
- declaration form indications; to support users in their decision on what declaration form they should use given their income profile (biljettenwijzer).
- Frequently Asked Questions (veelgestelde vragen)
- The content of most of the Administration's brochures;

Users could also order 'brochures': To order a brochure, users had to fill in their names, addresses, etc. using an electronic web form[36].

Business Taxpayers


The virtual front office for business taxpayers offered information especially for starting entrepreneurs;
- Informational topics especially for entrepreneurs that started an enterprise (onderwerpen);
- Addresses of all Administration branches concerned with the Business Taxpayers Division and the Customs Division, addresses of other governmental or semi-governmental institutions that were important for starting entrepreneurs[37].
- Frequently asked questions ('Veelgestelde vragen)

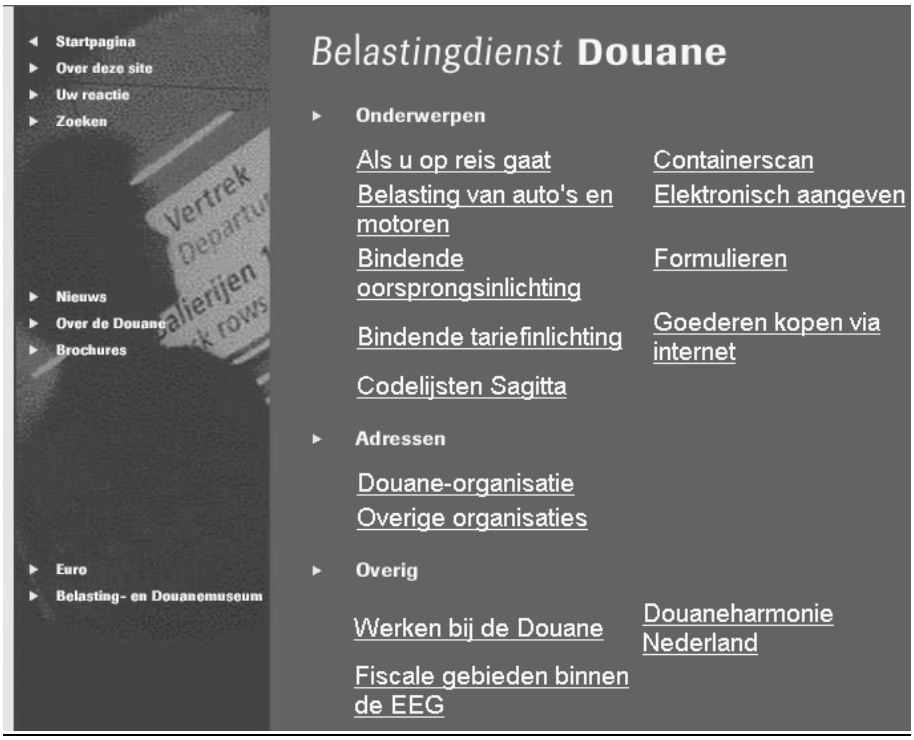
Moreover, business taxpayers were able to order brochures and CD-ROM's via this deeper level front office using electronic order forms.

Customs Division

. . . . . .

36 This electronic form transferred all orders to a single file that was sent to a third party that delivered the brochures by postal mail the next day or the day after the next day.

37 For instance addresses of all Dutch Chamber of Commerce branches.




This virtual front office offered information for private and business entities:
- information for international travellers (als u op reis gaat);
- a summary on declaration forms (formulieren)
- information on ordering via the Internet (goederen kopen via internet);
- code lists for import en export systems (codelijsten sagitta)
- addresses of the Customs Division branches plus addresses of branches concerned with import and export advice and promotion (overig).

Besides reading from screen, users could order brochures from the Customs division[38].

Special site

*The job vacancies and teaching practices section of B/AC contained:*
- Information on job vacancies and teaching practices at B/AC, retrievable via a reference-based search engine.
- Information on the conditions of employment at B/AC.
- Information on how to apply for a job at B/AC.
- Organisational information on B/AC itself, as an employer.

In total, including the upper level, the information service contained 4 information items: general Information (news, search, etc.) information for private taxpayers, information for business taxpayers and information of the customs division.

38 Again, to order a brochure one had to fill in name, address, etc. using an electronic order form.

***DIEC – Period***

During this period the following parts were added, on top of the information services implemented during the PDC period.

Special sites


Since the end of 1997 tailor-made information retrieval modules were made available concerning ten general tax themes concerning youngsters (working, scholarship, cohabitation, marriage, owning a house, saving money, borrowing money, owning a car, company car, motorcycle). However, one could also browse through the items without applying the tailor-made modules.

During the DIEC-period the interval in which news was published on both the Private and the Business Taxpayers sub front offices changed: news was published every three to six months. During the PDC period this took place on a monthly basis..

During the DIEC-period a site that wasn't related to the upper level hyperlink structure was implemented to service the EDI software industry called the Centraal Coördinatiepunt Softwarehuizen (co-ordination centre software manufacturers). This site offered among others information on EDI specifications.

Special sites

*Job openings and teaching practices*

- Job vacancies and teaching practices guided with a search engine; users were offered electronic search forms to find job openings at the Administration as a whole.
- Information on the conditions of employment at the Administration.
- Information on how to apply for a job at the Administration.
- Organisational information on the Administration as an employer.

In total, including the upper level, 3 new information items were added during this period, information for youngsters and information for the EDI software industry, and one special site.

***B/CKC – Period***
During the B/CKC-period the intervals at which news was published changed:
- At the Private Taxpayers sub front office news was published every two to three months.
- At the Business Taxpayers sub front office news was published every two to three months.
- At the Customs sub front office news was published every week.

Moreover, during the B/CKC period the following service was added, on top of the information services, which had already been introduced during the PDC and DIEC-period:

Business Taxpayers
In 1998 so-called ' tools' were added that enabled users to perform calculations concerning specific tax situations of business taxpayers.

| |
|---|
| In total, including the upper level, 1 new information item was added during this period, 'tools' that enabled users to perform calculations |

Pilot Projects
The Administration initiated two e-mail pilots. These pilots enabled a small group of users to e-mail several units of the Administration and ask for status information - tracking and tracing - concerning their tax declaration. The Administration initiated these pilots to find out what the possible technological, organisational and jurisdictional would be of a, at that time, new contribution to the Virtual Information Space. Namely access to personal information. In 2000 these pilots were still up and running. However, the pilots were excluded from the samples because they were not yet in an operational phase.

### 3.1.2. Communication services

***PDC – Period***
The homepage + deeper levels
'Your comments' (Uw reactie): communication concerned with the virtual front office itself was often about the user interface or the contents of the virtual front office, such as comments, questions, advice, etc. For example:
- I want to make a compliment about your site.
- Where can I find information about cars and taxes on your site?
- I advise you to use another background colour.
- I found an invalid hyperlink.

Handling this type of communication was a task of the EIO. The EIO members themselves dealt with the e-mails. Almost all sessions between EIO members and users were based on a single loop - a single reply to a single e-mail. Replies concerned as much standardised answers as possible. Occasionally that wasn't possible. For instance when a user couldn't find the information he nedded, a hyperlink to the correct page was sent. Or when a user found an invalid hyperlink, first the hyperlink was fixed and then the user was notified. Only on a few occasions did double loops occur - users replying to a reply of an EIO-member. EIO members were

obliged to always answer such replies. Communication sessions continued as long as the user kept replying. In most cases, users stopped the session after the third reply of an EIO-member. Triple-loop sessions were very rare.

The number of e-mails concerned with the web site is given below.

| | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|
| EIO | App. 1,500 | ? | ? | App 4,000 | App. 4,000 |

If a user asked for, or referred to *specific* tax information -registering complaints for instance, or asking personal status information about their tax situation - the user would receive a standard reply: he or she should contact the nearest branch of the Administration. E-mails weren't forwarded to individual employees within the Administration's back office. There was no connection between the external Internet e-mail infrastructure and the internal e-mail infrastructure. It was not possible to engage into formal, personal, tax related communication with the Administration[39].

As the number of e-mails on *general* tax oriented questions grew, at two sub front offices so-called 'call-back services' were implemented, namely at the Private Taxpayers and Business Taxpayers sub front offices. Via electronic forms users could indicate that they had a tax-oriented question and that they wanted to be called by phone about certain themes during certain times of the day. The messages were forwarded to the already existing helpdesk-departments of the Private Taxpayers and Business Taxpayers Divisions. At two existing departments, the Customs front office and the Helpdesk for Electronic Data Interchange, e-mail reply services -using as much standardised answers as possible - were implemented, thus making these departments act as intermediaries between www.belastingdienst.nl and the Administration. The figures show that not all questions could be answered via e-mail because some users left out vital contextual information. These users were called back via telephone.

The number of incoming e-mails per callback service is presented in the table below.

| Call-back service | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|
| Private taxpayers | ? | ? | 9,704 | 14,042 |
| Business taxpayers | 313 | 1,053 | 1,927 | 3,561 |

The numbers of incoming e-mails per e-mail service are presented in the table below.

| Customs | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|
| Incoming | - | 1,489 | 2,512 | 2,870 |
| Outgoing | - | 1,220 | 1,475 | 2,163 |
| Answered via telephone call | - | 269 | 1,037 | 707 |

39 This policy was considered necessary because of it-related and legislation-related doubts. Because identification or authentication of e-mail was simply impossible when using standard e-mail technology based on the SMTP-protocol.

| B/SEB | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|
| Incoming[40] | ? | 2,000 | 5,000 | 10,000 | 14,000 |

Of course 'face to face'-help was asked for too. The next figures show the number of private taxpayers that visited a branch office asking for help in declaring their income[41]:

*Campaign helping with taxpayers to declare (x 1000)*

| | 1995 | 1996 | 1997 | 1998 | 1999 |
|---|---|---|---|---|---|
| Numbers | 150 | 163 | 149 | 124 | 109 |

Special sites

*Job openings and teaching practices at B/AC*

Part of the communication service was that users could generate job applications using electronic web forms. These applications were transferred from www.belastingdienst.nl via e-mail to the B/AC personnel department.

| | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|
| Personnel B/AC | 5 | 122 | 465 | 615 | 682 |

In total, 6 new communication items were added during this period; web site e-mails, call-back service for private and business taxpayers, e-mail service for customs, B/SEB, and job openings and teaching practices at B/AC.

***DIEC – Period***

Special sites

*Job openings and teaching practices at the Administration as a whole*

Users could generate job applications using electronic web forms. These applications were transferred from www.belastingdienst.nl via e-mail towards the Administration's department that takes care of amongst others applications[42]. This department was responsible for all job application traffic towards other locations of the Administration. Except for job applications for positions at B/AC, which were forwarded directly to the personnel department of B/AC.

| | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|
| Personnel Administration | - | - | ? | 750 | 4963 |

Manufacturers of the software industry could e-mail via the CCS site with the Administration. These messages were forwarded to an already existing

40 Outgoing e-mail has not been registered.

41 Although these numbers show a decline over the years a relationship with the offered information services at the virtual front office can't be drawn since that wasn't part of this research.

42 Located at B/CKC (WSenL).

department called AI&AA. Most of the time the questions were related to where to find a representative within the Administration that could help them in solving a problem etc.

| | 1996 | 1997 | 1998 | 1999 | 2000 |
|---|---|---|---|---|---|
| AI&AA | - | - | Appr. 100 | Appr. 250 | Appr. 450 |

In total, 2 new communication items were added during this period; e-mails for job openings and teaching practices at the Administration as a whole and e-mails for the software industry.

***B/CKC – Period***
During this period, no extra communication features were added.

***Important notice***
After the EIO had been transferred to B/CKC, a new communication service was implemented into www.belastingdienst.nl. However, due to the moment of implementation, this service was no longer part of the sample. The service was implemented especially for private and business taxpayers which had interests (work or business) abroad. The messages were forwarded to a team called ‘Landelijk steunpunt Grensoverschrijdend werken en ondernemen’.

### 3.1.3. Transaction services

***PDC – Period***
'The main entrance'
There were no transaction services at the upper level.

Private Taxpayers
A digital signature was necessary for identification to declare taxes via the declaration software - see chapter 3.1.4. Therefore, a web form for obtaining a 'digital signature' was offered.

Users were offered an electronic decision form in order to help them decide whether they should declare their income via the regular declaration form for adults or a special form for youngsters.

Users could order declaration forms (on paper) and the declaration software (on disk) using web forms.

In total, 2 new transaction items were added during this period; help form and digital signature.

***DIEC – Period***

During this period, no extra transaction items were added.

***B/CKC – Period***

Business Taxpayers

Although there was a pilot project in 1998 and 1999 concerned with business taxpayers declaring via the Internet, this service was not fully operational halfway 1999. Therefore, during the case study the virtual front office concerned with business taxpayers contained no new transaction features.

Customs division

There were no transaction services at this deeper level front office.

During this period, no extra transaction items were added.

***Important notices***

In 1999 the Administration finished a web transaction pilot ("aangeven en betalen loon- en omzetbelasting via het Internet" - to declare and pay income tax and VAT via the Internet) that captured new technology and utilisation from the Virtual Transaction Space, i.e. secure, identified, authenticated, online, real-time declaration and payment. This pilot enabled a small, non-representative group of business taxpayers (i.e. labelled as innovators) to declare and pay taxes via a web interface. However, the deliverables of the pilot project could not be implemented[43]. There were various reasons for this, including non-compatibility with both the existing Administration internal business processes[44] and the internal administrative processes of business taxpayers[45], possible security breaches[46]. Also, the existing technical infrastructure[47] couldn't meet the demands. In 2000 the pilot project was prolonged. Up to the beginning of 2002 the pilot's deliverables were still not implemented. Nevertheless, the pilot wasn't part of the samples because it did not concern the operation of www.belastingdienst.nl.

In 1999 a new project was launched called WEB2000. WEB2000 had to realise several demos showing what future versions of www.belastingdienst.nl could look like. They had to include the, at that time, latest concepts and technologies of the Virtual Information Space, the Virtual Communication Space and the Virtual Transaction Space. I.e. personalised applications, access to and mutating personal information, formal electronic correspondence including identification and authentication (for instance for the use of registering complaints), and secure, online, real-time payment. Moreover, up to the beginning of 2002 the pilot's deliverables were not implemented. Again, this project wasn't part of the samples because it did not concern the operation of www.belastingdienst.nl.

In both cases, security was an important consideration. The Administration insisted that it should be able to identify who is communicating and to authenticate what is communicated. The Administration also demanded that secure lines were used. To make this possible, the Industry has to come up with affordable (the Administration will not adopt techniques that are

. . . . . .

[43] Belastingdienst,1999, pilot evaluation 1.1, page 12.

[44] Belastingdienst,1999, pilot evaluation 1.1, page 12 and 19.

[45] Belastingdienst,1999, pilot evaluation 1.1, page 35.

[46] Belastingdienst,1999, pilot evaluation 1.1, page 37.

[47] Belastingdienst,1999, pilot evaluation 1.1, page 25.

expensive to users) and user-friendly techniques. Moreover, the techniques had to be legally accepted, i.e. a digital signature via the Internet had to have a legal status. That wasn't the case.

One has to bear in mind that these concepts and technologies were already up and running in the mid and late nineties. It was already possible to conduct secure credit card transactions: www.amazon.com introduced this in 1995 and www.fleurop.com in 1997. Today, in 2002, both sites also feature personalised access. Also, at the turn of the century, for instance electronic banking via a personalised web interface while using authentication and identification technology and accessing and mutating personal information is already common practice. For instance, at www.abnamro.nl, www.sns.nl, www.rabobank.nl, www.citibank.de, www.direktbank.de, www.creditlyonnais.fr, and so on and so forth.

### 3.1.4. Distribution services

***PDC - Period***

During the PDC period, tax declaration software was added to the web site. The software originally came on a disk, which could be ordered by phone or mail. However, at the start of the www.belastingdienst.nl period it could also be obtained directly from the virtual front office by downloading the software. However, after filling out the electronic forms inside the software program, it had to be uploaded via the public switched telephone network (PSTN).

The number of electronic declarations grew enormously over the years. Meanwhile, the number of private taxpayers remained rather stable.

**Electronic declarations from private taxpayers (x1000)**

| | 1996 | 1997 | 1998 | 1999 |
|---|---|---|---|---|
| Floppy disk[48] | ? | 541 | 623 | 737 |
| Modem | ? | 222 | 419 | 588 |
| Total | 353 | 763 | 1.042 | 1.325 |

**Number of Private Taxpayers (x 1000)**

| 1996 | 1997 | 1998 | 1999 |
|---|---|---|---|
| 4.701 | 4.937 | 4.953 | 4.878 |

In total, 1 new distribution item was added during this period; download of declaration software.

***DIEC – Period***

Special sites

Parallel to the tax declaration software for adults the special site for

48 The Administration anticipated the fact that in the Netherlands, especially in the mid nineties, the number of computers without an Internet connection exceeded the number of computers with an Internet connection. Therefore the software could also be obtained on disk.

youngsters offered declaration software for youngsters. This software could only be obtained via downloading and it was not available on disk!

Moreover, until then the declaration software had been IBM compatible. Therefore, the Administration joined up with the Dutch Macintosh User group and initiated a market research project to find out how many Macintosh users were interested in electronic declaration - users had to fill in a web form on the Administration's web site. However, the number of interested users was too low - only 2000 Macintosh users enlisted - to risk the investment.

| |
|---|
| In total, 1 new distribution item was added during this period; download of declaration software for youngsters |

***B/CKC – Period***

| |
|---|
| During this period, no new distribution items were added. |

### 3.2. Organisational structure

Listed below are the collected data belonging to the research unit 'organisational structure'. First the environmental impulses and the attached strategic variables (3.2.1) are described and then the organisational impulses and the design variables (3.2.2).

#### 3.2.1. Strategic variables

***The 19th century***
From the 19th century until the (nineteen) Sixties and Seventies western society contained so-called social and religious blocks, in particular in the Netherlands. In this country every block had its own newspaper, educational system, union, or broadcast company. The blocks even had their own hospitals. The blocks were used as an instrument for protecting the social standards of a particular group. By shielding the (confessional) group against the outside world, group members could be protected from what were considered modern and hideous social developments such as the battle of the classes, feminism and atheism.

Since this situation in Dutch society lasted a hundred years, the organisational environment could be considered rather stable and homogeneous. The Administration anticipated this environment via a functional organisation approach.

The division and co-ordination of tasks within the Administration was to a high degree aligned with the different sorts of taxes such as VAT, income tax or sales tax. This alignment was not only visible in the back office itself but also at the front office: every tax had its own front desk. So taxpayers had to get in touch with the Administration at several points instead of one desk.

***The 1960's until the 80's***

During the 1960's and 70's the blocks' borderlines faded away due to the secularisation and the increasing importance of the individual person. The enormous growth in economic well-being, geographical mobility, higher educational levels, the growing importance of science in society and the rise of mass media such as radio and television enabled block members to take notice of the social standards of other blocks.

Church and religion lost their power. Traditional bonding between political parties and their voters weakened. The 'cultural revolution' during the 1960's and 70's changed sexual morals and altered the position of the family as one of the cornerstones of society. Marriage lost its status as the one and only acceptable way of living together. The 'one-person-household' was introduced and the way in which children were raised changed. The common chain-of-command within the family was replaced by a more equal relationship between parent and child.

All these developments caused civilians in the Netherlands to become less obedient and more willing to criticise several authorities. Authorities were no longer accepted as a matter of course, and laws and rules were not taken for granted anymore.

The decision-makers of the Administration realised that society had become far more dynamic and heterogeneous than before. The administration faced a changing 'tax moral'. Proofs[49] of the size and appearance of fraud was a direct cause for the Administration to consider an increase in the enforcement of its control and anti-fraud methods.

The Administration was fully aware of the importance of a solid service towards taxpayers and a solid information supply. Because if taxpayers had to obey the law, they obviously not only had to know the law but they also had to be treated with respect. Within this framework prevention and raising the odds to get caught were considered intertwined. Both were the keys of a redesigned policy on law enforcement which focussed on integrated customer[50] treatment.

To anticipate such an environment the Administration decided to apply a product-market combination as an organisational approach towards its environment. This approach is founded on the main features of the Administration’s views on management and control. The Administration considers its chain-of-command to be most effective when its management can focus on policy domains relevant to target groups.

***The Nineties***

In the Nineties the Administration's environment was considered to grow even more dynamic and complex. The Administration faced a number of trends such as:

- Internationalisation of taxes, driven by the European Union;
- Multi-cultural developments in Dutch society;

. . . . . .

[49] The 'Van Bijsterveld' inquiry in the 1970's.

[50] The Dutch Administration doesn't consider taxpayers to be subjects or civilians anymore, but customers!

- The consequences of the Act on public access to government information (initiated on 1st of May 1992).

The point of departure of the Act on public access to government information is that anything that the Administration documents is public, except in the case of fiscal confidentiality or an exceptional case within this Act.

Disclosure can be either passive or active.

Active disclosure is considered necessary when it serves the interest of decent and democratic governance. Because of this consideration the Administration actively publishes its application of the Tax and Custom legislation. This way the subject is enabled to perform the duty that results from the legislation and to claim the right to judge the outlines of the Administration's performance

The Act on public access to government information supports the request for publication, i.e. passive disclosure. If so, the Administration has to consider if there are restrictions to publish the information.

In 1995, one of the Administration's units that directly supported the Administration's board, the Planning, Finance and Control division at the Ministry of Finance, released a green paper on electronic information services. This green paper focussed on anticipating future developments concerned with media use by the public. The green paper stated that:

*"Our world is subject to massive and fast changes, amongst others because of the rise of new electronic media. (Belastinginformatie, structuurschets voor de elektronische Belastingdienst, 1995, page VII)*

In the Nineties the Administration faced an increasing number of demands from its environment in general (for instance political parties, unions, social security and welfare administrations) and from taxpayers in particular. Taxpayers more and more wanted clear and unequivocal information, which should be available 24 hours a day and 7 days a week. The Administration's board became more and more convinced that the importance of applying the Internet as an instrument increased rapidly. It was seen as a tool to stay in touch with Dutch society, especially taxpayers. And for anticipating the demands of the environment. Following this line, the board decided in 1996 to stop out-sourcing the Internet hosting activities and to start 'in-sourcing' as many Internet hosting activities as necessary.

The Administration allocated a substantial part of its budget to the installation of the DigiBel program. This program was among other reasons installed for keeping the Administration up-to-date with the developments concerning the increase of the use of digital channels in Dutch society. The program again allocated a part of this budget to one of its project organisations, called DIEC. DIEC put together a temporary team in a multidisciplinary setting based on collaborating with past, present and future stakeholders. In this setting the present EIO members (from PDC), the future EIO members (from B/CKC), and members of the future technical hosting environment (from B/AC) could co-operate in order to implement a fully hosted virtual front office that dealt with (at that time mainly) information services. The assignments had to be completed within two

years.

Although the Administration applies all three of the strategic variables, only one of them - collaboration - is more or less a result of embracing the Internet, namely collaboration with PDC. Embracing the Internet in its turn seemed to be the result of applying network behaviour. Moreover, as presented above, applying product-market combinations strongly affected the way the Administration designed its virtual front office.

### 3.2.2. Design variables

The design variables give shape to the formal organisational structure. The design variables show the division of tasks, competencies and responsibilities among people and institutions. They also show what the connections between persons and institutions are. Design variables are used to handle the variety of impulses coming from the organisation in order to gain and keep a fit situation. The design variables are:
- breadth of Functionalisation;
- depth of Functionalisation;
- horizontal division of tasks;
- horizontal centralisation versus horizontal decentralisation;
- delegation.

***Breadth of Functionalisation***
*PDC 1995 - 1996*
Between 1995 and 1996 the EIO-team at PDC was a multi-disciplinary team grouped along four main disciplines:
- text editing, which included gathering news;
- program writing;
- web site design;
- information advice.

Within the EIO at PDC every EIO member had alongside his or her main task three additional tasks:
- maintenance of the several web sites, including other than the Administration's web sites;
- handling website generated communication, including other than the Administration's web sites;
- codification - most editors could perform several aspects of manual program codification, such as writing in HTML or creating data files that contained keywords that were used in order to generate search results. Manual codification was performed whenever applying web content tools was insufficient.

*DIEC 1996 - 1998*
DIEC had three major sections:
- Communication;
- IT;
- Electronic publishing.

At DIEC the EIO was a multi-disciplinary team grouped on the basis of one main discipline; editing. The EIO was fit into the section Electronic

Publishing. The EIO consisted of a project manager, five team members specialised in editing and two team members specialised in webmaster activities.

At DIEC all activities concerned with program writing were dispatched from the EIO and concentrated in the IT section. All other website development activities such as web design, information retrieval and cognitive ergonomics were concentrated in the Communication section. Both IT and Communication were ordered to constantly perform activities concerned with innovations.

Within the EIO at DIEC the following tasks were performed;
- text editing: gathering new was excluded from the EIO and transferred to several units within the Administration:
  - News at the Private Taxpayers sub front office was taken care of by the External and Internal Communication department at the Private taxpayers Division;
  - News at Business Taxpayers sub front office was taken care of by the External and Internal Communication department at the Business taxpayers Division
  - News at Customs sub front office was taken care of by the Customs Helpdesk
- maintenance of the website (upper and deeper levels);
- handling web site generated communication;
- codification (most editors could also do some program codification, such as filling databases with meta-tags in order to generate search results);
- Documenting activities, before transferring operations from DIEC to B/CKC every activity related to operating www.belastingdienst.nl and …@belastingdienst.nl had to be documented in order to save this knowledge for future members of the EIO. So future members amongst other could repeat the activities.

The same goes for the period from 1998 to 1999 at B/CKC, except for documenting operations.

From the above it can be concluded that over the years for the EIO the breadth of Functionalisation became narrower

***Depth of Functionalisation***

At PDC both program writers and editors were considered to be proactive in advising the commanding customer. The advice was concerned with what changes had to be submitted in order to keep the Administration's web sites up-to-date according to the latest ICT developments and web site concepts. They were considered to be the sparring-partners of the commanding customer. Once an advice was granted program writers and editors were involved in the total course of developing, implementing, and maintaining the new elements on the specific web site.

As stated before, research and development at the DIEC and the responsibility to be proactive in advising on the latest ICT developments and web site concepts was transferred to the section IT and the section Communication.

At B/CKC this situation was maintained. Research and development was not

transferred to B/CKC or B/AC, only maintenance of the web site (to B/CKC) and the web server (to B/AC). In 1999 all research and development activities remained located at the project organisation DIEC[51].

From the above it can be derived that over the years for the EIO the depth of Functionalisation decreased.

***Horizontal division of tasks***

Within the EIO at PDC (1995 - 1996) tasks were clustered in line with projects generated by commanding customers. EIO members at PDC not only had tasks within the Administration projects, but also project tasks generated by commanding customers outside the Administration. So the horizontal division of tasks was somehow functionally oriented.

Within the EIO at DIEC (1996 - 1998) tasks were clustered in line with the Administration's three virtual front offices based on the three main divisions[52]. Because these front offices were not alike (they looked and felt different, and the technology and maintenance differed as well), the tasks were not alike either.

During the periods that are mentioned above the horizontal division of tasks was somehow product or market oriented. Whereas the following shows that in the B/CKC period the horizontal division of tasks was somehow functionally oriented.

At B/CKC (1998 - 1999) the management decided to cluster all EIO activities in line with publishing processes that were already present at one department of B/CKC, namely BDP (= Beheer Digitale Producten; maintenance of digital products). All members and tasks had to be merged into one of the clusters of this department:

- Acceptance (intake and account management)
- Document maintenance (locating source material)
- Information retrieval (ergonomics, designing information retrieval concepts)
- Editing and publishing (text editing, handling e-mail, and maintenance of several web sites)

***Horizontal centralisation versus horizontal decentralisation***

At PDC the EIO members were situated in a matrix oriented organisation structure. The commanding customer could be considered the product department unity-of-command whereas PDC itself could be regarded as the functional department unity-of-command.

In order to effectively and efficiently divide the human resources among several assignments, almost every PDC member was allocated to a range of assignments and commanding customers. So there was almost no PDC member that was constantly assigned to one commanding customer.

. . . . . .

[51] In 1999 the DigiBel program merged both its project organisations DIEC and EDI into one project organisation called 'the DigiBel project organisation'.

[52] Private taxpayer, Business taxpayer, Customs.

At DIEC the EIO members again were situated in a matrix organisation. Cost account managers represented the several commanding customers. They could be considered the product department unity-of-command whereas the aspect Electronic Publishing Support could be considered as the functional department unity-of-command. The EIO members were part of the aspect Electronic Publishing Support and could therefore be considered a part of the functional department unity-of-command in the matrix organisation. Account managers had to contact the EIO team leader in order to give assignments to the EIO.

At B/CKC the EIO members were situated within one department with four functional unity-of-commands ('Acceptance', 'Document maintenance', 'Information retrieval', and 'Editing and publishing'). Project managers or staff members within B/CKC had to contact BDP management by means of the head of department in order to have EIO members participate in non-BDP projects.

From the above it can be derived that for long time there was a horizontal decentralisation (expressed within a matrix organisation structure). But once the EIO was transferred to B/CKC a horizontal centralisation could be witnessed.

***Delegation***

At times when the EIO was hosted by PDC the chain of command was relatively short. The commanding customer's representative was in chain of command. Echelons above him granted him a high degree of autonomy. In his turn the commanding customer's representative delegated most responsibilities to the functional unity of command. His two most important interests were that web site releases were fiscally correct and published in time. He delegated responsibilities to the EIO concerned with:

- Retrieving tax content from the Administration(responsible: tax editor);
- Editing, program writing and web design (responsible: all EIO members)
- handling e-mail (responsible: EIO members, although non-regular e-mail had to be forwarded to the commanding customer's representative).
- Web site users were enabled to order brochures. To do this, members of the EIO at PDC always had to make sure that the brochure codes were up to date and connected with the proper fields in a database that took care of handling the orders.

In contrast with the PDC-period, during the DIEC-period the commanding customer was no longer completely in chain of command. From now on the DigiBel program was responsible for the Administration's web sites. Within DigiBel's project organisation DIEC all three sections (IT, Electronic Publishing, and Communication) were put in chain-of-command as it came to developing:

- Information retrieval concepts (Communication);
- Program writing developments (IT);
- Web site text developments (Electronic Publishing).

So at DIEC the chain of command increased and as a result the EIO could make less decisions:

- Due to the fact that the section Communication was responsible for developing a new information retrieval concept the EIO members could not autonomously change the web site interfaces.

- Due to the fact that the section IT was responsible for program writing EIO members, for instance, could not autonomously change the search engine.

Moreover, several (project)managers at DIEC started to introduce more points of control over content during a project than before. Previously, they only exercised control once: the moment before a release was published. As a result, the margins of program writers, editors and web designers to make decisions diminished.

At B/CKC (1998 - 1999) the chain of command increased even further. Planning and control became stronger by introducing project schemes and working time registration. As a result, the EIO's margin to make decisions diminished once again. However, it has to be said that EIO members managed to gain back a little autonomy, when they were allowed to hold periodical discussions with contractors about small changes to the web site on the basis of user comments and suggestions - made via e-mail. These discussions could, for instance, concern adding new information or re-designing small parts of www.belastingdienst.nl.

From the above it can be derived that over the years for the EIO delegation decreased.

### 3.3. Internal communication structure

This chapter presents data belonging to the research unit 'communication structure' . All observed communication flows to and from the EIO are described by means of vertical and horizontal communication flows[53].

#### 3.3.1. Vertical communication flows

***Downward communication***

Instructions

Downward instructions came as assignments and were either related to updating the content of www.belastingdienst.nl or to designing an additional part of www.belastingdienst.nl.

The intervals increased during the years. At PDC they were given by merely one representative of the Administration (i.e. the representative of the Private Taxpayers Division) and the frequency was low. However, by the time the EIO had been transferred to B/CKC the number of internal commanding customers had grown and so had the number of instruction intervals during a year.

During the research period the vertical communication flow between the Administration and the virtual front office consisted mainly of assignments from commanding customers to the EIO. At the time of PDC the

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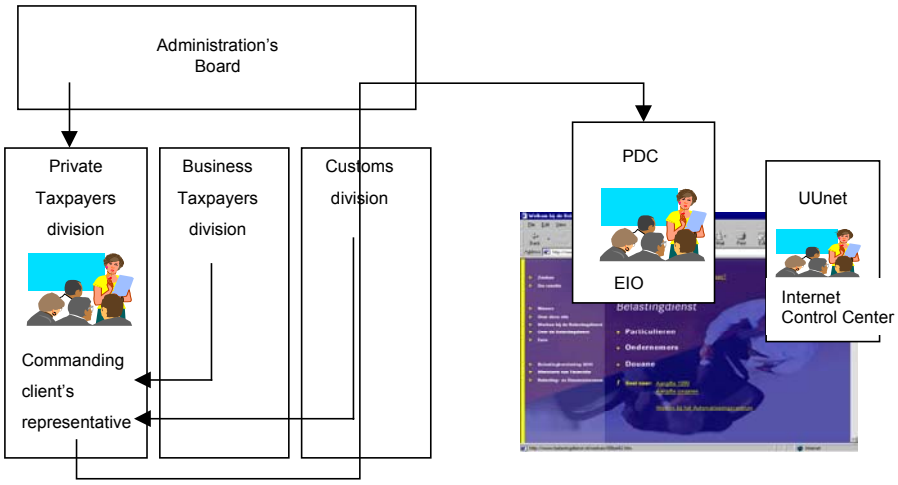
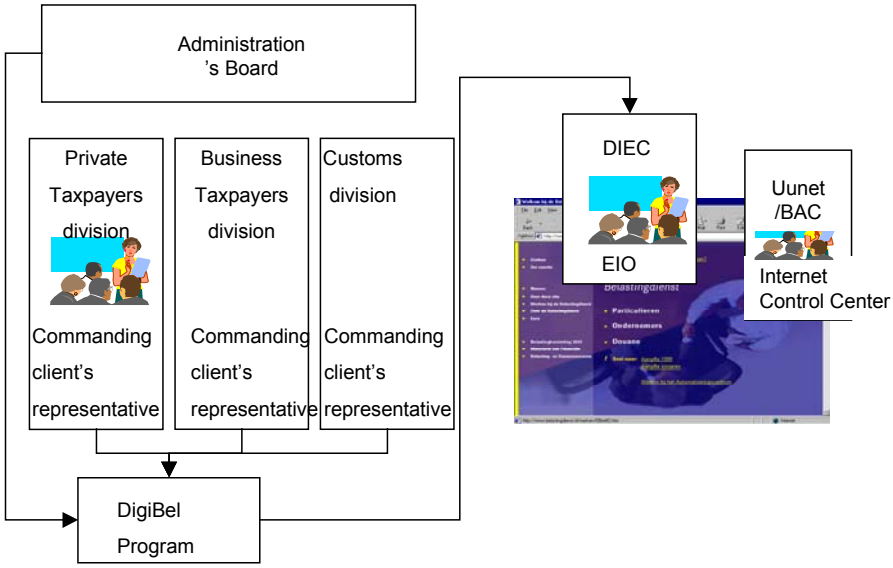
53 There were no formal diagonal communication flows related to the operation of www.belastingdienst.nl detected.

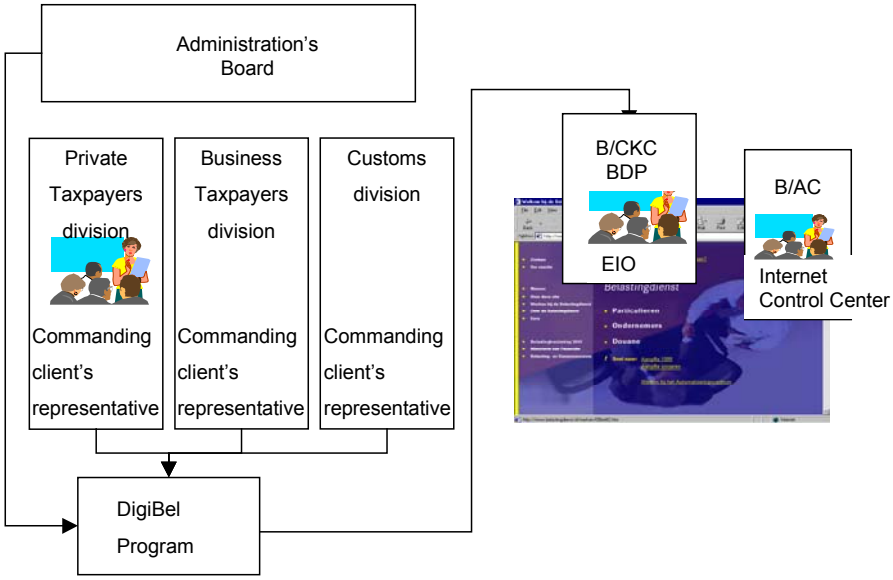
representative of the Private Taxpayer Division was the only one who gave such assignments.




Later on, starting at the DIEC period, representatives of other commanding customers plus the board also gave direct assignments. The DigiBel program acted as the first contractor when the assignment concerned a web site innovation. If not, then DIEC acted as the first contractor.




At the B/CKC period the DigiBel program still acted as the first contractor if the assignment concerned a web site innovation. If the assignment did not concern innovation then B/CKC would act as the contractor.




In general, the downward instructions were not accompanied by guiding explanations, procedures, practices, etc. in terms of why or how activities had to be carried out. This was not the case during the PDC period, nor during DIEC or B/CKC.

***Upward communication***

Information about day-to-day operations

All the virtual front offices generated user statistics. Presenting figures was never a regular item. However, if it occurred these figures were always moderated before they were presented. The user statistics were never presented in an integral fashion since WWW statistics are not easy to interpret. One could easily misinterpret the figures, for example by mixing up the amount of hits on homepages with the amounts of visitors.

Besides verbal agreement on deadlines, there was very little formal vertical communication within the EIO at the 'PDC-period'. Only on a few occasions were agreements put on paper. Tenders and project schemes were presented in broad outlines and contained very little information on 'how things were done' or how for example web server applications had to be maintained, let alone altered.

At DIEC the EIO had an implicit drive to increase the formal vertical communication. However, especially in the beginning projects schemes and tenders written by the individual EIO members did not receive much attention, neither from commanding customers nor from the management. After a year the situation improved, though these documents never gained a high formal status.

At B/CKC the status of formalised communication increased. For instance, the EIO tended to accept a new web site as soon as the following conditions had been met:

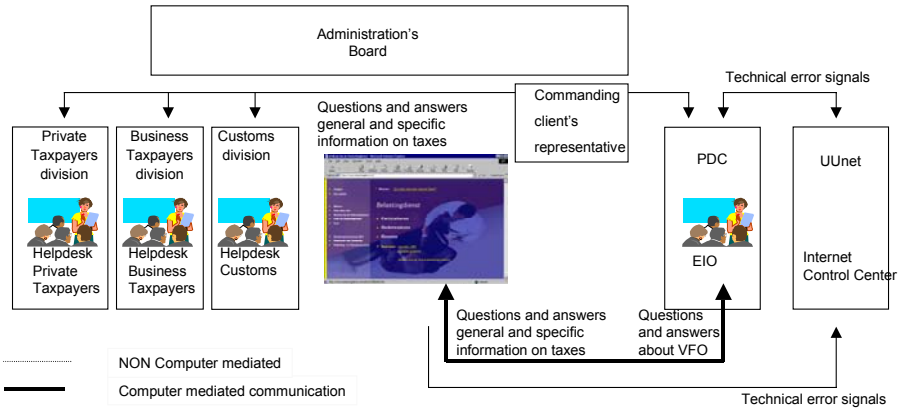
- The web sites accorded with the digital house style.
- There was a transfer document for the new web site, which described, in detail, all aspects of the server applications and source codes of

PERL scripts, Java applets, etc.
- The commanding customer had formally signed a tender or project scheme.

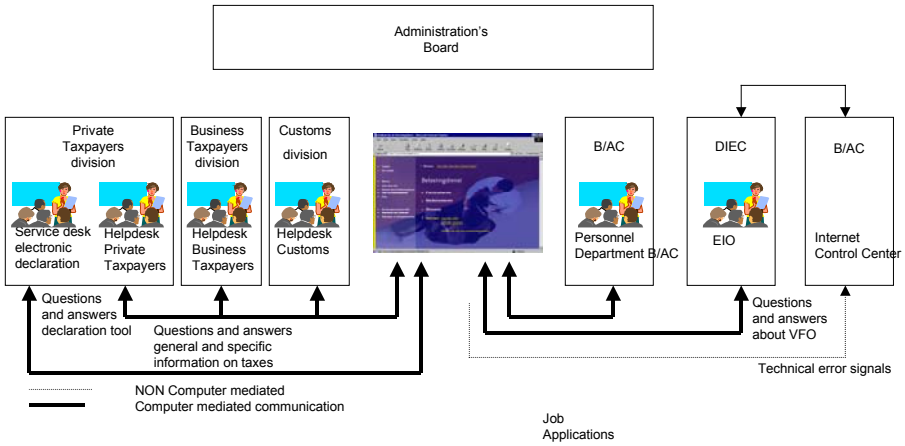
### 3.3.2. Horizontal communication flows

Most of the communication flows generated by the virtual front office were horizontal and carried by means of e-mail messages.

***PDC-period 1995 - 1996***
During the first period almost the entire stream was taken care of by the EIO. If questions couldn't be answered easily, the messages were forwarded to the customer's representative who would send them to the proper team within the Administration. The representative would also take care of collecting the answer and would hand it over the EIO who in turn answered the initial e-mail question.

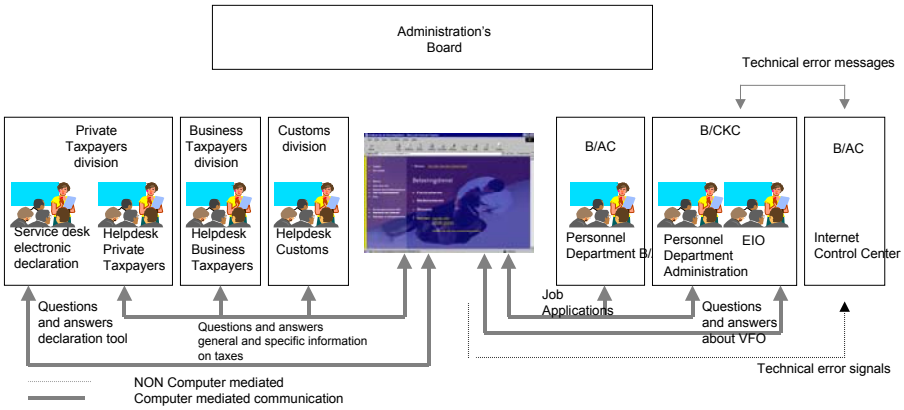



***DIEC period 1996 - 1998***
During the DIEC period the virtual front office started to host more and more communication services. Moreover, to improve the handling of all the streams more computer-mediated communication channels (using e-mail) were opened.




***B/CKC period 1998 - 1999***
During the first period only B/AC published and handled job applications. However, during the B/CKC period job openings in the entire Administration

were first published. The applications that followed were handled by the Administration's personnel department located at B/CKC.




If by accident an e-mail message was addressed to the wrong department then this particular e-mail message would be forwarded to the actual department that had to take care of the e-mail message. A copy of this message was sent to the original sender as a notification that the message was forwarded to and answered by another department.

So-called 'working agreements' between the relevant intermediate departments supported these horizontal communication flows. These 'working agreements' contained agreements on what sort of messages were to be forwarded and to which department. These 'working agreements' did not have a formal status, but they weren't completely informal either. At the beginning there was a lot of horizontal communication going on between the departments, via phone calls or face-to face meetings. But this sort of communication decreased over the years. In the end it only took place if it was 'hard to tell' which department had to answer an e-mail message.

This means that once the workload generated by the virtual front office had been imbedded – in other words every department knew how to handle communication with taxpayers - task co-ordination no longer was an issue. As a result the horizontal communication flows between the EIO and other units weakened.

# 4. Conclusions

This chapter captures the conclusions of this research. In the first place, by discussing how the results relate to the research questions and hypotheses (4.1). Second, by relating the results to the fundamental statements (4.2). And finally, by proposing the set of categories for the use of future research related to the impact of the Internet on organisations. Moreover, next to the set of categories several topics for further research are proposed (4.3).

## 4.1. Answering the research questions

This section intends to answer the six central research questions. The answers to these questions are derived from the data as presented in the previous chapter. The questions were put forward as follows:

1A Does the Administration's strategic apex decide to create a channel to the Digital World because it wants to carry out the Administration's mission as effectively as possible?

1B If so, does the Administration's strategic apex do this as soon as it observes that the organisation's regular environment is turning to the Digital World?

2 Is the Administration able to create a structural coupling with the Digital World by implementing a virtual front office?

3A Does the Administration, in order to maintain its structural coupling with the Digital World, aim to adapt its virtual front office?

3B If so, does the Administration do this as soon as it observes that one or more of the four Virtual Spaces that it is connected to starts to change?

4A Does the Administration more and more connect the structural coupling(s) provided by its virtual front office to its organisational structure by applying variables that tend to type A?

4B If so, does the Administration's virtual front office become less adaptable?

5A (=4A) Does the Administration more and more connect the structural coupling(s) provided by its virtual front office to its organisational structure by applying variables that tend to type A?

5B If so, is the Administration hesitant to create a full structural coupling with that particular Virtual Space of the Digital World that covers the domain of its core business the most?

6A Does the Administration's organisational structure change when its virtual front office provides communication services?

6B Does the Administration's internal communication structure change when its virtual front office provides communication services?

7A (=4A) Does the Administration more and more connect the structural coupling(s) provided by its virtual front office to its organisational structure by applying variables that tend to type A?

7B If so, does the virtual front office provide a structural coupling with the Virtual Communication Space?

7C If so, does the virtual front office increasingly focus on controlling communication flows with the Virtual Communication Space?

First question:

1A Does the Administration's strategic apex decide to create a channel to the Digital World because it wants to carry out the Administration's mission as effectively as possible?

1B If so, does the Administration's strategic apex do this as soon as it observes that the organisation's regular environment is turning to the Digital World?

First hypothesis:

In an effort to carry out the organisation's mission most as effectively as possible, the strategic apex will decide to create a channel to the Digital World, as soon as it observes that the organisation's regular environment is turning to the Digital World.

In 1995, the Administration's first web site was published at www.dds.nl. From July 1996 the web site resorted under the Internet domain belastingdienst.nl. Initially, the operation of this web site was out-sourced and conducted at PDC. In 1996, however, the board decided to 'in-source' the Internet hosting activities. By taking this step, the decision to create a channel with the Digital World became more manifest. Given that the services that were hosted at www.belastingdienst.nl and …@belastingdienst.nl first concerned information, the Administration created a channel with the Virtual Information Space first. But was the board's decision based on the observation that the organisation's environment was turning to the Digital World?

In 1995, one of Administration's units that directly supported the Administration's board, the Planning, Finance and Control division at the Ministry of Finance, released a green paper on electronic information services. This green paper focuses on future developments surrounding the use of media by the public. Because, as the Green paper puts forward,

*"Our world is subject to massive and fast changes, amongst others because of the rise of new electronic media. (Belastinginformatie, structuurschets voor de elektronische Belastingdienst, 1995, page VII)*

So the board's decision was indeed based on an observation: the board members had observed that the organisation's environment was turning to the Digital World. However, how did this decision relate to the mission of the organisation?

The Administration's mission can be found in its core assignment, which states that: *The Administration executes the commissioned legislation as efficiently and effectively as possible and it aspires to enforce legal security and equal justice in all its actions. Serving and respecting the public are inextricably linked to these actions.*

The answer to the first research question can be found in the last part of its core assignment. As the results show, the Administration's board became more and more convinced that the importance of applying the Internet as an instrument was increasing rapidly. They realised that it was a tool for anticipating the demands of the environment and for staying in touch with Dutch society, i.e. the public. After all, Dutch citizens were increasingly using digital channels. For that reason, it is possible to conclude that the Administration's board wanted to offer services to the Digital World to meet the demands of the public. Secondly, it wanted to 'stay in touch with taxpayers, i.e. the public', via the Digital World. Both facts clearly indicate that the Administration, in its attempt to create a channel to the Digital World, was respecting and serving the public.

So, the answer to the first research question is; *yes*, the Administration's strategic apex did in fact decide to create a channel to the Digital World because it wants to carry out the Administration's mission as effectively as possible. *Yes*, it did so as soon as it observed that the organisation's regular environment was turning to the Digital World.

Second question:

Is the Administration able to create a structural coupling with the Digital World by implementing a virtual front office?

Second hypothesis:

By implementing a virtual front office an organisation is able to create a structural coupling with the Digital World.

Besides offering information services via www.belastingdienst.nl., the Administration also initiated communication services. Initiating the latter service initially meant that users were invited to ask questions and make comments. In the beginning these questions were related to the web site itself. Soon after, questions related to general tax information were handled. Moreover, the Administration started to offer transaction-related services. Namely, the possibility of electronic declaration by means of downloadable tax declaration software and, amongst others, a feature to create an electronic signature.

The number of page views, the number of received e-mails and the number of downloads of declaration software grew considerably. A growing number of clients used the call-back service or created an electronic signature. However, the question is, can these interactions be seen as a history of recurrent interactions leading to structural congruence? In order words, did these interactions result in mutual changes, between two (or more) systems, in this case between the Virtual Information Space, the Virtual Communication Space and the Virtual Transaction Space on one hand and the Administration on the other hand? Because, only when mutual changes

occur, one can speak of structural coupling.

The results show that two out of four services led to mutual changes caused by the history of interactions.

***Information service***
Every time a user was unable to find the information he was looking for, a hyperlink was sent to the correct page. Or, when a user found an invalid hyperlink, first the hyperlink was fixed and then the user was notified. As such, either the virtual front office changed, for instance by fixing a hyperlink, or the user's initial perception that the information was not available changed. Moreover, periodically changes were made based on all user comments and suggestions (in e-mails), for instance by adding new information or by re-designing small parts of www.belastingdienst.nl.

***Communication services***
Although almost all sessions between EIO members and users involved a single loop - a single reply to a single e-mail - the communication services also led to a number of mutual-based changes. Not as much because of one single user, but because of the growing number of users as well as the growing number of different subjects that were no longer related to the virtual front office itself. As the number of e-mails on general tax oriented questions increased at two sub front offices, so-called 'call-back services' and 'e-mail reply services' were implemented.

***Transaction services.***
Besides the growing number of software downloads - mind that the upload was established via PSTN - the results don't show any significant, established changes based on mutuality in the transaction services. However, the Administration did initiate a web transaction pilot that enabled a small, non-representative group of business taxpayers to declare and pay taxes via a web interface. Therefore, it can be concluded that there was a certain willingness to make changes to these services based on mutuality, i.e. based on demands and needs of the pilot participants.

***Distribution service***
Moreover, until that moment the declaration software had been IBM compatible. Together with the Dutch Macintosh User group the Administration initiated a market research to see how many Macintosh users were interested in electronic declaration - users had to fill in a web form on the Administration's web site. However, the number of interested users was too low - only 2000 Macintosh users enlisted - to risk the investment. From this the conclusion can be drawn that there was a certain willingness to make changes to the services based on mutuality, i.e. based on the needs and demands of the Dutch Macintosh user group.

Therefore, the answer to this research question is: *yes*, the Administration was able to create a structural coupling with the Digital World by implementing a virtual front office, namely the Virtual Information Space and the Virtual Communication Space. It also demonstrated a certain willingness to create a structural coupling with the Virtual Transaction Space and the Virtual Distribution Space.

Third question:

3A Does the Administration, in order to maintain its structural coupling with the Digital World, aim to adapt its virtual front office?

3B If so, does the Administration do this as soon as it observes that one or more of the four Virtual Spaces that it is connected to starts to change?

Third hypothesis:

To maintain its structural coupling with the Digital World an organisation will aim to adapt its virtual front office as soon as the organisation observes that one or more of the four Virtual Spaces that the organisation is connected to starts to change

From the start the Administration invited users to comment on its web site, which included comments and advice on how to improve the services that were offered. The Administration also encouraged users to ask questions, which in return were answered.

The invitation to make comments and ask questions shows that the Administration was willing to enable recurrent interactions. As stated in chapter 1.1.1., when recurrent interaction leads to structural congruence then structural coupling takes place.

The conclusion above (see second research question) has already shown that over the years a structural coupling has been established between the Virtual Information Space and the Virtual Communication Space on one hand and the Administration on the other hand. Despite the fact that these structural couplings had already been established, the Administration kept enabling interaction, thereby fostering possible new mutual congruencies. This shows that the Administration has been willing to maintain its structural coupling with the Digital World. The question is whether the Administration has done so because of the changes in those Virtual Spaces of the Digital World to which it is connected - i.e. the Virtual Information Space or the Virtual Communication Space.

First of all, the mere fact that the Administrations has asked for comments and advice already shows that it is open to suggestion, and willing to adapt its services to the needs and demands of users from both Virtual Spaces. Moreover, it periodically altered its web site based on the comments and advice of users.

Secondly, the Administration initiated two e-mail pilots. These pilots enabled a small group of users to e-mail several units of the Administration and ask for status information - tracking and tracing - concerning their tax declaration. The Administration initiated these pilots to find out what the possible technological, organisational and legal impact would be of a concept that can be located in the Virtual Information Space, i.e. access to (government) personal information.

In the third place, the Administration initiated a project (WEB2000) in order

to find out whether its services could be extended with the - at that time - latest concepts and technologies of the Virtual Information Space and the Virtual Communication Space, namely personalised applications, access to and mutating personal information, and formal electronic correspondence including identification and authentication.

The above not only shows that the Administration was willing to preserve it structural coupling with both the Virtual Information Space and the Virtual Communication Space, but also that it was prepared to keep up with the developments in both the Virtual Information Space and the Virtual Communication Space.

So, the answer to this research question is: *yes*, the Administration has in fact aimed to adapt its virtual front office in order to maintain its structural coupling with the Digital World. *Yes*, the Administration has done so as soon as it observed that one or more of the four Virtual Spaces that it is connected to started to change.

Fourth, Fifth and Seventh Question, A:

Does the Administration more and more connect the structural coupling(s) provided by its virtual front office to its organisational structure by applying variables that tend to type A?

Fourth hypothesis:

The more the structural coupling(s) provided by the virtual front office is connected to the organisational structure by applying variables that tend to type A, the less adaptable a virtual front office will become.

To determine whether or not a structural coupling is supported by variables that tend to type A, the results must support the statements captured in the following table:

| **Type A** | **Variable** |
|---|---|
| Low | Decentralisation |
| Low | Functionalisation |
| Low | Delegation |
| Low | Participation |
| High | Standardisation |
| High | Separation |

***Decentralisation***
The results show that there was a decrease in decentralisation. Soon after communication flows concerned with general tax information increased, the handling of this e-mail was transferred to the departments of the Administration that are authorized to answer these questions - i.e. the helpdesk departments. Moreover, the results show that the Administration focussed on transferring both the functional and the technical operations of www.belastingdienst.nl to those departmental units that were actually concerned with editing processes on one hand (B/CKC) and IT processes (B/AC) on the other hand.

***Functionalisation***
At PDC assignments came from a wide range of customers. At DIEC assignments came from the EIO team leader. At B/CKC assignments came from BDP's head of department. As the EIO was transferred from PDC via DIEC to B/CKC, the degree of the unity of command increased. Therefore, the Functionalisation decreased once the EIO had been transferred to the Administration.

***Delegation***
The results clearly indicate that, as far as the information service are concerned, delegation decreased when the EIO was transferred to the Administration. As to the communication services, as many standardised answers as possible had to be used, and the EIO was only allowed to make small changes to the content of the answers. In other words, it had a narrow margin for making decisions.

***Participation***
The results show that after its transfer to B/CKC the EIO regained some involvement in high-level organisational decision-making as far as the virtual front office was concerned. The EIO was allowed to hold periodical discussions with contractors about small changes to the front office on the basis of user comments and suggestions (in e-mails). On the basis of those suggestions they added new information to the web site or re-designed small parts of www.belastingdienst.nl.

***Standardisation***
Notwithstanding the fact that it wasn't a research characteristic, it was still more or less possible to analyse the data for standardisation. At DIEC, one of the tasks of the EIO was to document activities for the use of future members of the EIO, in order to enable them to repeat the activities. Moreover, at B/CKC project schemes and working time registration were introduced. Finally, it became obligatory to use e-mail forms and to reply e-mailed questions as much as possible with standardised answers. All events indicate that standardisation was increasing.

***Separation***
The degree of separation increased, as creative 'thinking' was more and more separated from the actual 'doing'. At DIEC all activities involving program writing were transferred from the EIO and concentrated in the IT section. All website development activities, such as web design, information retrieval and cognitive ergonomics, were concentrated in the Communication section. Both the IT section and the Communication section were ordered to constantly perform activities concerned with innovations.

During the PDC period the volume of the communication flows increased, and the nature of their content changed. Until then, most e-mails had been web site-related, but now tax-related questions started coming in - which required a lot of thinking, especially for non-fiscalists. For that reason the hosting of the services was transferred away from the EIO to the various helpdesk departments.

The table below shows the decrease or increase of the degree of several variables that supported the information and communication services as the hosting of the services was transferred to the Administration.

| Type A | Variable |
|---|---|
| Decrease | Decentralisation |
| Decrease | Functionalisation |
| Decrease | Delegation |
| Increase (!) | Participation |
| Increase | Standardisation |
| Increase | Separation |

The only deviation from an ideal type A organisation is the participation variable. All other variables are handled as in an organisation that tends to type A. Therefore, it can be concluded that the hosting of the services was supported by variables that tend to type A, once they had been transferred to the Administration.

So, the answer is, yes, the Administration more and more connects the structural coupling(s) provided by its virtual front office to its organisational structure by applying variables that tend to type A.

Fourth question B:

If so, does the Administration's virtual front office become less adaptable?

Fourth hypothesis:

The more the structural coupling(s) provided by the virtual front office is connected to the organisational structure by applying variables that tend to type A, the less adaptable a virtual front office will become.

From 1995 to 2000 the services provided by www.belastingdienst.nl were gradually embedded in the Administration's operations. In the beginning the information and communication services were hosted outside the Administration, namely at PDC.

Over the years, tasks related to hosting information and communication services were more and more transferred[54] from the EIO to Administration's organisational structure:

- Information services: more and more information was produced somewhere else and merged into ongoing processes concerned with editing.
- Communication services: the EIO's scope to handle communication narrowed, from handling all sorts of communication to handling web site-related communication only. The rest was transferred to several helpdesks or intermediate departments of the Administration.

Transaction services and distribution services, as already mentioned, were restricted to an older concept of downloadable electronic declaration software that came from the ongoing declaration processes of Administration itself.

54 Narrowing width of functionalisation, decreasing both depth of functionalisation and delegation.

The amount of information grew enormously over the years. All sorts of topics and arithmetical tools were added. However, the rate of expansion, concerning the items per service, decreased over the years. Although it has to be said that the B/CKC period only covers one year (1999) and the other periods each cover two years.

| | PDC | DIEC | B/CKC | Total |
|---|---|---|---|---|
| Information ser. | 4 | 3 | 1 | 7 |
| Communic. ser. | 6 | 2 | 0 | 8 |
| Transact. Ser. | 2 | 0 | 0 | 2 |
| Distribution ser. | 1 | 1 | 0 | 2 |
| Total | 13 | 5 | 1 | 19 |

Today, more than three years later (1999-2002), the web site is still hosted at B/CKC. During this period, three extra information items have been added: information on the Euro, information on the new tax system and educational material for tax mediators. There are also two additional communication items, but no there are no new transaction items[55].

Considering the above, the numbers would be as follows:

| | PDC | DIEC | B/CKC | Total |
|---|---|---|---|---|
| Information ser. | 4 | 3 | 4 | 10 |
| Communic. ser. | 6 | 2 | 2 | 10 |
| Transact. ser. | 2 | 0 | 0 | 2 |
| Distribution ser. | 1 | 1 | 0 | 2 |
| Total | 13 | 5 | 6 | 24 |

The numbers show that, once the hosting of www.belastingdienst.nl and …@belastingdienst.nl had been transferred to the Administration, it took the Administration almost six years, starting with DIEC in 1997, to equal the number of items that had been added to the services before they were transferred to the Administration.

However, a slow-down of the expansion rate doesn't indicate whether the Administration's front office became less adaptable. Adaptability depends to a large extent on whether virtual front office can adopt the new contributions that are introduced in one or more of the Virtual Spaces it created a structural coupling with.

To determine whether the front office is still adaptable, the pilots should be taken into consideration. The results show that in 1999 pilots were started involving both Virtual Spaces to which the Administration was connected. The first set of pilots enabled a small group of users to e-mail several branches of the Administration and ask for status information - tracking and tracing - concerning their tax declaration. These pilots were initiated in order to find out what the possible technological, organisational and legal impact would be of this - at the time - new concept of the Virtual Information Space. Secondly, the Administration initiated a project (WEB2000) in order to find out whether the information, communication and transaction services could be extended with the - at that time - latest concepts and technologies of, amongst others, the Virtual

55 See appendix C

Communication Space, i.e. personalised applications, access to and mutating personal information, and formal electronic correspondence including identification and authentication.

So, the rate at which the number of functionalities expanded for each service that the Administration's virtual front office provided, decreased over the years. Notwithstanding the fact that at the same time several (relatively new) contributions that were up and running (see chapter 1.1.3.) had changed the Virtual Information Space and the Virtual Communication Space. The initiation of the pilot studies not only shows that the Administration was aware of these concepts and technologies, but also that these concepts and technologies were interesting enough to make an effort to adopt them.

Besides finding it difficult to adopt new contributions from those Virtual Spaces it already had a structural coupling with, the decreased adaptability of the Administration's virtual front office can also be deduced from an organisational structure that:

- forced the virtual front office to steady the interactions with the Digital World that flow from: A) contributions that have already been adopted from the Digital World, or B) contributions introduced into the Digital World by the organisation itself: *because of its high degree standardisation, the Administration used standardised answers and e-mail forms to channel the communication flows. Free format e-mail was nearly impossible.*
- Prevented the virtual front office from adopting new contributions to the Digital World at all: *there was no formal, personal, tax-related communication possible. This policy was considered necessary because of IT-related and legislation-related doubts. The technology couldn't meet the demands of standardisation. Both identification and authentication of e-mail was either very difficult or simply impossible when using standard e-mail technology based on the SMTP-protocol.*

This, plus a decreasing rate of expansion parallel to the transfer of the hosting of services to the existing organisational structure on the one hand, and at the same time the willingness to adopt new concepts and technologies on the other hand, leads to the following conclusion. The more the hosting of services was connected to the Administration's organisational structure by applying variables that tend to type A, the less its virtual front office kept pace with the changes in the Virtual Spaces it was connected to.

So, the answer to this particular research question is: *yes*, the Administration's virtual front office does become less adaptable.

Fifth question, B:

If so, is the Administration hesitant to create a full structural coupling with that particular Virtual Space of the Digital World that covers the domain of its core business the most?

Fifth hypothesis:

An organisation that implements its virtual front office services into its organisation by applying variables that tend to type A, is hesitant to create a full structural coupling with that particular Virtual Space of the Digital World

that covers the domain of its core business the most.

Before answering this research question, it needs to be clarified which Virtual Space covers the Administration's core business the most.

The Administration's core business concerns levying and collecting taxes, the auditing of bookkeeping systems, the investigation of fraud and exercising customs control on the import, export and transit of goods. Levying and collecting taxes is related to exchanging value. The same goes for auditing bookkeeping systems and investigating fraud, since auditing bookkeeping system is related to whether or not enterprises and private taxpayers properly declare taxes. Customs control on the import, export and transit of goods on the other hand is related to the distribution of goods in the real world, not in the Virtual Distribution Space. Therefore, it can be said that the Virtual Transaction Space covers the Administration's core business the most.

As mentioned before, the results do not show any significant mutual changes in the transaction services. In fact, a full structural coupling between the Administration and the Virtual Transaction Space has never been established. The question is whether the absence of such a structural coupling could be ascribed to hesitation.

Declaring via the Internet network, let alone via a web-interface was never initiated, only via PSTN. Moreover, if a user formally asked for, or formally referred to personal, tax-related information - concerned with his tax declaration - the user was asked to contact the nearest branch of the Administration. E-mails that contained questions of this kind weren't forwarded to individual employees in the Administration's back office. There was no connection between the external Internet e-mail infrastructure and the internal e-mail infrastructure. This policy was considered necessary because the Administration had IT-related and legislation-related doubts. Identification or authentication of e-mails was simply impossible when using standard e-mail technology based on the SMTP-protocol.

On the other hand, in 1999 the Administration finished a pilot project with business taxpayers for web interface enabled declarations ("aangeven en betalen loon- en omzetbelasting via het Internet" - to declare and pay income tax and VAT via the Internet). In 2000 this pilot project was prolonged. But the deliverables were still not operational at the beginning of 2002, partly because they were not compatible with both the Administration's internal business processes and the internal business processes of business taxpayers.

As a result, the situation remained unchanged: an older concept of electronic declaration was re-used, and the public Internet network infrastructure was still bypassed by using PSTN. Besides, the Administration initiated a project (WEB2000) in order to see whether the information, communication and transaction services could be extended with the - at that time - latest concepts and technologies of, amongst others, the Virtual Transaction Space, i.e. secure, online, real-time payment. Again, this feature was not operational at the beginning of 2002.

The above leads to the following conclusion: as far as transaction services are concerned, for more than seven years the Administration has hosted a

non-Digital World concept, i.e. a concept that is not based on the combination of the public Internet network and Internet communication media. It did not succeed in getting a transaction service operational that was entirely based on Internet technology. However, the Administration did initiate several pilots to find out how these services could be implemented. The pilot projects show that the Administration has a certain willingness to open a transaction channel. However, the deliverables of the pilot projects could not be implemented. Given the various explanations (i.e. non-compatibility of business processes on both sides), one may well speak of hesitation related to the creation of a structural coupling with the Virtual Transaction Space by means of a full transaction service.

So the answer to this research question is: *yes*, the Administration is hesitant to create a full structural coupling with that particular Virtual Space of the Digital World that covers the domain of its core business the most, namely the Virtual Transaction Space.

Sixth question, A and B

6A Does the Administration's organisational structure change when its virtual front office provides communication services?

6B Does the Administration's internal communication structure change when its virtual front office provides communication services?

Sixth hypothesis:

An organisational structure and its internal communication structure will change when a virtual front office provides communication services.

Except for the eight intermediate departments - EIO, B/SEB, Helpdesks (3), Personnel (2), and AI&AA - no Internet communication media were introduced within the Administration during the research period that connected the virtual front office to the Administration's back office[56].

The EIO was launched especially for hosting the information services of www.belastingdienst.nl. The EIO was transferred via a temporary organisational body (project organisation DIEC) to a department within the Administration (B/CKC-BDP). Moreover, all other services were transferred to existing departments, which indicates that the breadth of functionalisation at these departments increased.

The internal communication structure changed temporarily. Temporary horizontal communication flows could be observed during the first three to four years after the Administration's web site had been published on the Internet. However, these flows ceased to exist once the original tasks of the EIO at PDC had been fully imbedded in B/AC and B/CKC and the several intermediate departments knew what to do.

. . . . . .

56 This situation was still the same in the middle of 2001, however, at the end of 2001 several departments (amongst others b/cpp, b/ac, and b/ckc)started to deploy e-mail for their employees' informal communication by means of pilot projects.

There was another, temporary and semi-formal, structural change. Alongside the horizontal communication flows semi-formal horizontal organisation structures were established via so-called working agreements between the relevant intermediate departments.

The above indicates that there were structural changes to be witnessed. First, the implementation of the communication services meant that new communication channels were opened and new relationships between several departments were initiated. Secondly, the breadth of Functionalisation at the intermediate departments increased.

One has to bear in mind, however, that horizontal communication channels only lasted for a restricted period of time and only on a semi-formal level. Moreover, once the communication services had been implemented, the communication structures and the organisational structures did not alter anymore. In spite of this, the answer to the sixth question is: *yes*, the Administration's organisational structure does change when its virtual front office provides communication services. And, *yes*, the Administration's internal communication structure does change when its virtual front office provides communication services.

Seventh question, B and C:

7B If so, does the virtual front office provide a structural coupling with the Virtual Communication Space?

7C If so, does the virtual front office increasingly focus on controlling communication flows with the Virtual Communication Space?

Seventh hypothesis:

The more a virtual front office is connected to the organisational structure by applying variables that tend to type A, the more the virtual front office will start to focus on controlling communication flows once the virtual front office has provided a structural coupling with the Virtual Communication Space.

The answers to research questions 2 and 4A have already proved that the Administration was able to create a structural coupling with the Virtual Communication Space by implementing a virtual front office. Moreover, the Administration did in fact connect this structural coupling to its organisational structure by applying variables that tend to type A.

Over the years the communication flows - originating in the Digital World and flowing via the Administration's virtual front office to its back office - started to increase. At the same time the Administration started to channel these flows by deploying web forms. Several types of communication flows were guided towards various departments within the Administration.

But there were more acts of controlling to be witnessed. First of all the Administration initiated an application that many web sites feature in order to prevent an overload of communication handling. Namely, the provision of answers to so-called frequently asked questions. Secondly, its information retrieval concept focussed on making sure that users were able to find the appropriate information as quickly as possible and without having to ask

where the information could be found. Finally, the application of arithmetical tools enabled users to simulate several tax situations and to answer questions themselves, without having to communicate with individual civil servants of the Administration.

Therefore, the answer to this research question is: yes, the Administration's virtual front office does provide a structural coupling with the Virtual Communication Space. And, yes, the Administration's virtual front office does increasingly focus on controlling the communication flows with the Virtual Communication Space.

### 4.2. Graphical overview of the research answers

The following graphical overview presents the answers to the research questions, namely:

In an effort to carry out its mission as effectively as possible the Administration's strategic apex decided to create a channel to the Digital World. It decided to do this as soon as it observed that its regular organisational environment started to turn to the Digital World, namely in 1995. In the same year the Administration implemented a virtual front office.

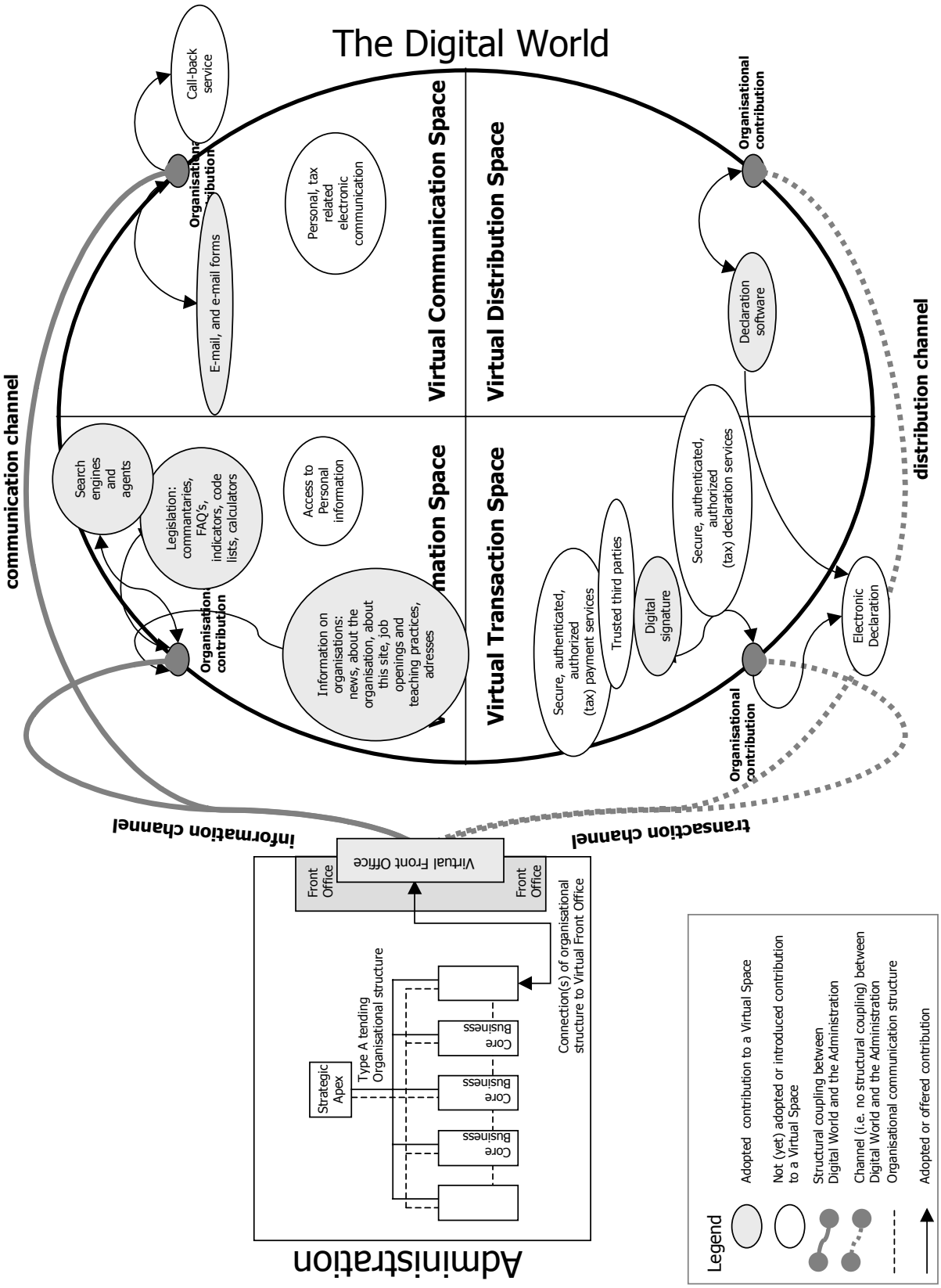
Once the Administration on one hand and the Virtual Information Space and the Virtual Communication Space on the other hand had started to adapt to each other, a structural coupling was created. In order to maintain that structural coupling the Administration aimed to adapt its virtual front office every time the Virtual Information Space and the Virtual Communication Space started to change.

However, the Administration's virtual front office became less adaptable as the structural coupling(s) was more and more connected to the Administration's organisational structure by applying variables that tend to type A.

Moreover, the Administration showed hesitation to create a full structural coupling with that particular Virtual Space of the Digital World that covers the domain of its core business the most, i.e. the Virtual Transaction Space.

Next to that, the Administration's organisational structure changed as the virtual front office provided communication services. As for the Administration's virtual front office, it started focussing on controlling communication flows once the virtual front office provided a structural coupling with the Virtual Communication Space.

The results that have been described above are captured by the following picture.


The Digital World
Virtual Communication Space
Virtual Distribution Space
Virtual Transaction Space
Call-back service
E-mail, and e-mail forms
Personal, tax related electronic communication
Declaration software
Search engines and agents
Legislation: commantaries, FAQ's, indicators, code lists, calculators
Access to Personal information
Information on organisations: news, about the organisation, about this site, job openings and teaching practices, adresses
Secure, authenticated, authorized (tax) payment services
Trusted third parties
Digital signature
Secure, authenticated, authorized (tax) declaration services
Electronic Declaration
Organisational contribution
communication channel
distribution channel
information channel
transaction channel
Administration
Front Office
Virtual Front Office
Front Office
Connection(s) of organisational structure to Virtual Front Office
Strategic Apex
Type A tending Organisational structure
Core Business
Core Business
Core Business
Legend
Adopted contribution to a Virtual Space
Not (yet) adopted or introduced contribution to a Virtual Space
Structural coupling between Digital World and the Administration
Channel (i.e. no structural coupling) between Digital World and the Administration
Organisational communication structure
Adopted or offered contribution

### 4.3. Revisiting the fundamental statements

The question that is posed in this section is; How do the results of the case study relate to the fundamental statements that were put forward in the theoretical framework?

1 A human can be considered an autopoietic organisation that interacts with its environment. Both do this in order to adapt to each other and therefore conserve both their organisations.

The results of this research are based on studying an organisation, not just one individual. In order to find the relation between the results and the first fundamental statement, the second statement has to be taken into consideration too.

2 As humans interact with each other over a longer period of time, they form groups. Groups develop certain structures. A group's structure determines its ability to adapt to its environment.

Proof of the Administration being a body that adapts to its environment, and vice versa, can be found in the fact that the Administration adapted its organisational structure to keep up-to-date with the dynamics and complexity of its environment.

When the organisational environment was considered rather stable and homogeneous, the Administration's organisation was based on a functional approach. However, with the advent of secularisation and the increasing importance of the individual, the Administration faced a changing 'tax moral'. Prevention and raising the odds to get caught were considered intertwined. Both were keys to a redesigned law enforcement policy, which focussed on integrated customer treatment. The Administration realised the transition from regarding civilians as subjects to seeing them as customers by means of a product-market combination. At this moment, the Administration even faces a new organisational approach: process-based grouping.

To a certain extent, the environment also adapted to the Administration. An interesting development, in the context of regarding civilians as customers rather than subjects, is the rising number and the clustering of demands to the Administration. Especially by political parties, unions, social security and welfare administrations, and several organisations that represent taxpayers.

In the 1990's the Administration applied the Internet as an instrument once people in Dutch society had started to make more and more use of a completely new environment, namely the Digital World. In return, once www.belastingdienst.nl had been initiated more and more people visited the web site.

So the results show that the Administration and its environment mutually adapted.

The Administration's virtual front office got more rigid once its services had been deeply embedded in its organisation. From this point of view the data also match that part of the statements where it says that an organisation's structure determines the adaptability to its environment.

3 In order to conserve their organisation, groups preselect environments to interact with only if these environments provide changes of state. Groups won't select environments to interact with if those environments will lead to destructive change.

The results show that an organisation that applies variables that tend to type A hesitates to choose a Virtual Space for an environment that covers the domain of its core business, namely the Virtual Transaction Space. Presumably, the sudden, extreme changes that occur in that Virtual Space cannot be coped with by the rigid organisational structure that characterises an organisation that handles variables that tend to type A. On the other hand, the Administration did create a structural coupling with the Virtual Information and the Virtual Communication Space. Both spaces do not cover the Administration's core business and can therefore be regarded as relatively harmless to the organisational structure.

Therefore, the results can be related to the statement that In order to conserve their organisation groups select environments to interact with only if those environments provide interactions that cause changes of state. Groups won't select environments to interact with if those environments provide interactions that lead to a destructive change.

4 Communication, especially through channels and media, meta-communication and the relational aspect of messages, is able to provide the structural relationship within a group and between a group and its environment.

The results show that the Administration had a formal communication structure, which consisted of vertical and horizontal communication flows. The vertical communication structure provided among others downward instructions. The horizontal communication structure provided several organisational units with a co-ordinating mechanism. This leads to the conclusion that the data match the statement that communication provides the structural relationships within a group.

The results also show the presence of a structural coupling between the Virtual Communication Space on one hand and the Administration on the other hand. This structural coupling is provided by the communication services of its virtual front office. In the framework of this research the Virtual Spaces of the Digital World are considered organisational environments. Therefore, the results can be related to the statement that communication provides the structural relation between a group and its environment.

5 If a group adopts the Internet network and Internet communication media it creates a channel to the Digital World. From that moment on it may receive perturbations from the Digital World. These perturbations may trigger changes in the structure of the group.

After the Administration implemented www.belastingdienst.nl and opened a communication channel, users started to interact with the Administration. First by sending comments on the web site and later on by asking tax related questions.

The increasing variety and number of questions that came via e-mail were a direct cause for the Administration to make structural adjustments to the link

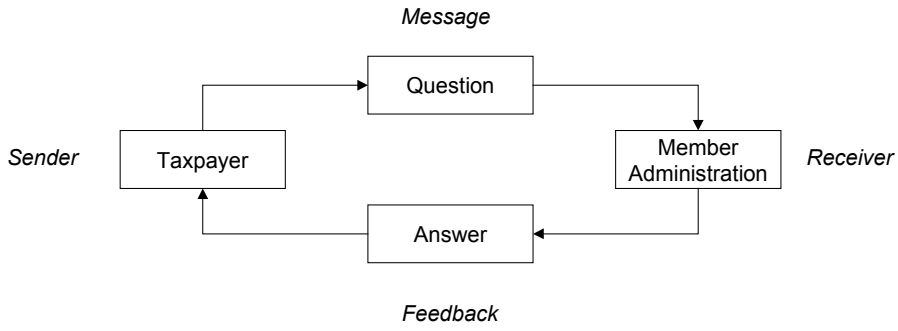
between its virtual font office and its back office. The hosting of communication services was transferred to the back office by assigning the handling of e-mails coming from www.belastingdienst.nl to one new and several existing departments.

The above indicates that some of the interactions with the Digital World caused perturbations, which triggered the Administration to change (parts of) its structure. In other words, the results show that an organisation can receive perturbations via the structural coupling with the Digital World. These perturbations can trigger changes within the structure of a group.

6 Internet communication media generate new types of communication processes, i.e. new channels for exchanging - by sending, notifying and interpreting - messages, that involve new types of information and new relational aspects.

By implementing communication services via e-mail, new channels for exchanging messages were created between the Virtual Communication Space and several organisational units of the Administration. As such, new communication processes did occur. So far, the results relate to this fundamental statement.

However, the communication processes that were generated by these Internet communication media didn't alter extremely or sudden after the media were adopted. Over the years, virtually all communication sessions involved single loops. Multi-loop communication sessions were rare, let alone communication sessions based on the principle of convergence.




Possible reasons for this are:
- The trigger why communication was initiated, namely only answering questions from taxpayers.
- The technical accommodation - using standard e-mail clients, and not, for example, the latest customer relation management based e-mail technology, newsgroup technology or synchronous communication as in chat technology.
- The subject of communication - general tax information only. Which is presented in a clear fashion and not likely to be negotiated on in order to reach a common understanding. General government information will probably never be subject to negotiation. Because several negotiations between law commissioners and law executors take place long before it is published.

I.e. as Rogers and Kincaid would put it, individual taxpayers and individual members of the Administration did not converge. In a convergence process

various realities are negotiated in order to reach a better common understanding - telling of both agreement and disagreement.

However, in the future this may be different. Several pilot projects show that the subject of communication tends to shift from general information towards status information and perhaps even towards personal file related information. Since personal situations differ from case to case, prognoses may be put forward that negotiating on various subjects may become common ground. In those circumstances the trigger to start communicating may shift from the taxpayer to the Administration, which would start a communication continuum between taxpayer and Administration.

7 The adoption of Internet communication media leads to changes in the structural relationships within a group and between a group and its environment.

Although the Administration did not - at least until the middle of 2002 - implement the hosting of communication services very deeply into its organisation, i.e. it used intermediate departments, the results provide evidence that the structural relationships within the Administration underwent a few small changes. There were, so to speak, a few triggers to slightly change the structure and thereby enabling the Administration to handle the interaction with the Digital World.

As such, the Administration moved to what Maturana and Varela call the domain of changes of state: all those structural changes that a unit can undergo without a change in its organisation - i.e. with conservation of class identity.

Moreover, the results show that the channel between the Administration and the Digital World has changed because its virtual front office provided communication services. Namely, by channelling the communication flows and adapting its virtual front office.

Considering the way the results provide the six statements, the next statements can be put forward:

1 The way in which Internet communication media are deployed determines to a high degree how the processes of communication will transform. It depends on the location of communication triggers (within the environment or within the organisation itself), the technology that is used and the subject, whether communication will either stick to single-loop sessions or shift to sessions based on convergence.

2 As long as the structural coupling with the Virtual Communication Space is not strongly supported by the organisation's structure and as long as Internet communication media do not provide convergence or a communication continuum, it is likely that the structural relationships within a group will remain unchanged, even when the communication processes between the organisation and its environment have changed.

In the end there are three overall conclusions.

The phenomenon of interaction, rather than the adoption of Internet communication media itself as put forward in the preliminary assumption in chapter 1.1.4, is the driving force of structural change in organisations.

It is the degree to which Internet communication media support a communication continuum and the degree to which the organisational structure supports the structural couplings with the Digital World that determine how strong the triggers are that will force both organisation and environment to change their structure.

It depends on the organisational structure whether or not an organisation is able to adapt to a changing environment.

### 4.4. Defining categories and further research

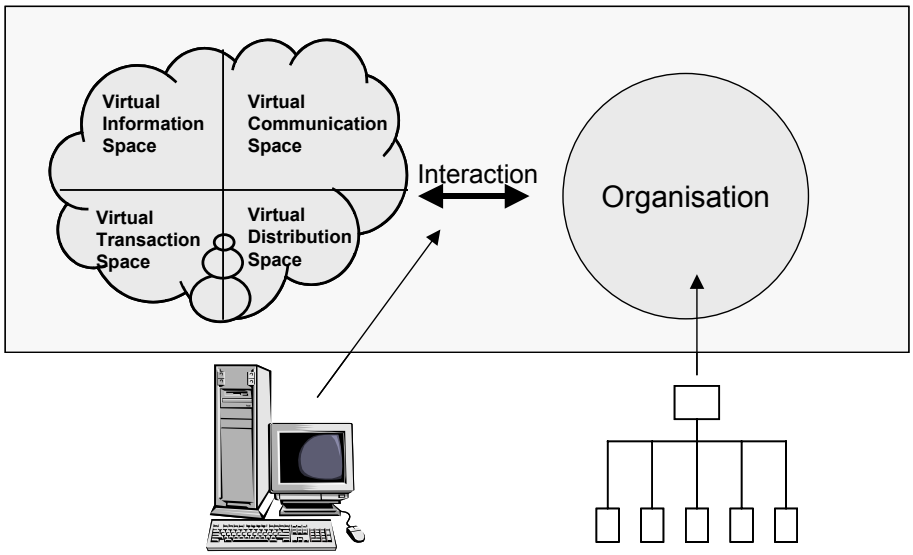
As implicitly indicated in chapter 2 the initial concern of this research was to explore a new and - as yet - unfamiliar phenomenon. This exploration had to be carried out in uncharted scientific territory, without having a clear shot at dependent and independent variables. Neither were there a large number of research units, linked to a vast number of research characteristics, available.

Section 2.3.1 stated that a research method (case study) had been applied in order to locate and describe any possibly relevant categories for the use of future research on how the Internet can affect organisations in general.

The application of these categories must enable further research to find proof that supports the overall conclusion of this dissertation.

To accommodate further research, first a top-level hierarchy of categories is put forward. The hierarchy is derived from the overall conclusion. After this proposition, the top-level categories are divided into subcategories. Each subcategory is then provided with a short, proposed explanation.

The top-level hierarchy categories are divided into two levels:
1 *Interaction* with an *organisational environment* such as *the Digital World* can force organisations to change their structure
2a The *organisational structure* determines whether or not an organisation is able to adapt to its environment
2b *Internet communication media* support interaction




***Interaction***

The term Interaction captures the wide variety of mutual influences that an organisation and its environment have on each other. These mutual influences come as perturbations that may cause changes in the structure of both organised system and environment. These changes may be adaptive or disruptive. Interaction can be described using the following sub-categories

- Loops: loops refer to the number of interactions between an organised system and its environment.
- Subject: subject refers to what the interactions are about. In other words: what is the informational aspect? Another characterisation of subject concerns the 'solidity' of the informational aspect, i.e. does it for instance concern information that cannot be argued about or is the information subject to change, as in discussions?
- Origin and destination: origin and destination refer to the (part of the) organisation and the (part of the) environment between which interaction takes place.

***Organisational environment***

Organisational environment refers to the context of the organisation. Organisational environment can be described using the following sub-categories

- Complexity: refers to the number of individual environmental domains from which input is received and to which output is generated.
- Dynamics: refers to the number (few, many) and the nature (progressive, regressive) of intervals in which input is received or output is generated
- Diversity: refers to the number of different products that are manufactured or the number of markets that are targeted.
- Causal relationship: refers to the dependence or independence of an organisation on its environment, i.e. who is in charge of determining input and output?
- External networks: refers to the constellation network of organisations that are in close range of the organisation, i.e. those which generate input and receive output.

***Organisational structure***
Organisational structure refers to the sum total of the ways in which its labour is divided into distinct tasks and then its co-ordination is achieved among these tasks. It depends on the organisational structure whether or not an organisation is able to adapt to a changing environment. This research puts forward that the less flexible an organisational structure is the less adaptable an organisation is to changes in the organisation's environment.

The an organisational structure can be deduced by describing the following six categories (see chapter 1.2.2. for a detailed description per category) per organisation:
1 decentralisation
2 functionalisation
3 delegation
4 participation
5 separation
6 standardisation

The flexibility of an organisational structure can be deduced by describing the level per category. Theory suggests that the higher the levels of decentralisation, functionalisation, delegation, participation and the lower the levels of standardisation and separation, the more flexible an organisation is.

***Digital World***
Besides the environmental aspect that can be ascribed to the Digital World, since it is an organisational environment, the Digital World can also be described using the next categories (see also chapter 1.2.1)
- Virtual Information Space
- Virtual Communication Space
- Virtual Transaction Space
- Virtual Distribution Space

- The Virtual Information Space provides individual users and groups of users with information. It contains product information, prices, legislation, opinions, news, hobbies, contact information, etc. Enabling Internet communication media for this space are, for instance, web sites, new groups and bulletin boards.

- The Virtual Communication Space offers the opportunity to users or groups of users to communicate with each other, either synchronously or asynchronously. Enabling Internet communication media for this space are, for instance, e-mail, instant messengers or chat.

- The Virtual Distribution Space enables users to move digital goods, such as software or music files, from one point to another. Enabling Internet communication media for this space are, for instance, file transport protocol and or peer-to-peer software transfer applications.

- The Virtual Transaction Space enables users to exchange value. Examples are buying goods, paying taxes and swapping voting rights. Enabling Internet communication media for this space are, for instance, credit card clearance and secure payment applications, cyber bucks, and electronic banking via web interface.

The four Virtual Spaces are subject to constant change because of three different types of contributions:
- technology
- utilisation;
- users.

***Internet communication media***
Refers to both the service that is provided and the technology that is applied by the organisation.
Services are divided into
- information services, which refers to the content itself but also to its retrievability: is it personalised or not?
- communication services, which refers to the content of communication, but also to the number of loops each session has and whether it is synchronous or a-synchronous.
- transaction services, which refers for instance to on-line or off-line applications, secure or non-secure payment, pre-paid, instant-paid, or post-paid systems.
- distribution services, which refers to how products are distributed, both via the Internet or triggered via the Internet and then prepared for shipment.

Technology can be divided into (see also chapter 1.1.3)
- Browser applications, including pug-ins
- Streaming video
- Internet TV
- Dynamic Servers
- File Transport Protocol
- E-mail
- Newsgroups
- Chat, including IRC, Java-based or messaging systems.

At first it seemed likely that Internet communication media, which accommodate communication services, were to change the communication structures of the organisation. In the event, it turned out that the virtual front office's communication services were provided by the organisational structure, rather than the communication structure itself. In other words, the organisational communication structure was not connected to the virtual front office, but to the organisational structure. Therefore, the original research unit organisational communication structure is not part of the proposed set of categories.

***Further research***
The theory and hypotheses developed within this research are tested on a single case study. Moreover, the theory is tested on a collection of already existing data. To improve the generalizability of the theoretical framework as put forward within this research further research is necessary.

Future research should focus on developing a measurable, operational set of categories and on exploring the causal relationship between the various categories and subcategories that have been presented above. Moreover, the overall conclusion suggest that the less flexible an organisational structure is, and the more an organisation connects the virtual front office

services tot this less flexible organisational structure, the less adaptable the virtual front office will become. Since such conclusion also suggest the opposite (the more flexible an organisation structure, the more adaptable a virtual front office), future research should also be conducted in organisation that have an organisational structure that indeed can be considered flexible. Therefore, to further develop and improve the theoretical framework as developed within this dissertation, the research questions mentioned below should be answered by conducting research in preferably not only:

- government services that support the executive…
- …and that struggle with improving their virtual front office services…
- … and that are aiming a customer oriented approach,

…but also in organisations that do not share those characteristics, at least not the first characteristic, since non-governments also may struggle with improving their virtual front office and aim at a customer oriented approach. Those organisations should not be excluded from the future research proposed here.

The proposed agenda for future research should define and focus on a research population that, in line with the structural approach, contains 1) type A organisations, 2) type B organisations, and 3) a mixture of type A and B organisations. Moreover, the population should contain units (i.e. organisations) that have the characteristics as listed above (government services, etc.), but also units that don't have the first characteristic (government services that support the executive).

Future research in the proposed population should answer the following research questions

- Does an organisation's strategic apex, in order to carry out the organisation's mission as effectively as possible, decide to create a channel to the Digital World by implementing a virtual front office as soon as it observes that the organisation's regular environment is turning to the Digital World?
- If and why organisations aim to maintain a structural coupling with the Digital World by adapting their virtual front office every time one or more of the four Virtual Spaces that the organisation is connected to starts to change.
- Whether all organisations that more and more connect the structural couplings provided by their virtual front office to the organisational structure by applying variables that tend to type A, in contrast to organisations that apply variables that tend to type B, share the same symptoms:
  - they have a virtual front office that becomes less adaptable,
  - they are hesitant to create a full structural coupling with that particular Virtual Space that covers the domain of its core business the most,
  - they have a front office that increasingly focuses on controlling communication flows once the virtual front office has provided a structural coupling with the Virtual Communication Space.
- What methods are there to increase the adaptability of structural couplings with the Digital World?
- How did viable organisations design their organisational and communication structures when they faced the Digital World?
- And, finally, an extended research to provide the fifth and sixth fundamental statements with more data; a study into whether communication is subject to change when Internet communication

media are used, including a study into the possible factors - such as technology, trigger and subject - that cause a communication continuum. And whether Internet communication media alter the structural relationships within a group.

# 5. Discussion

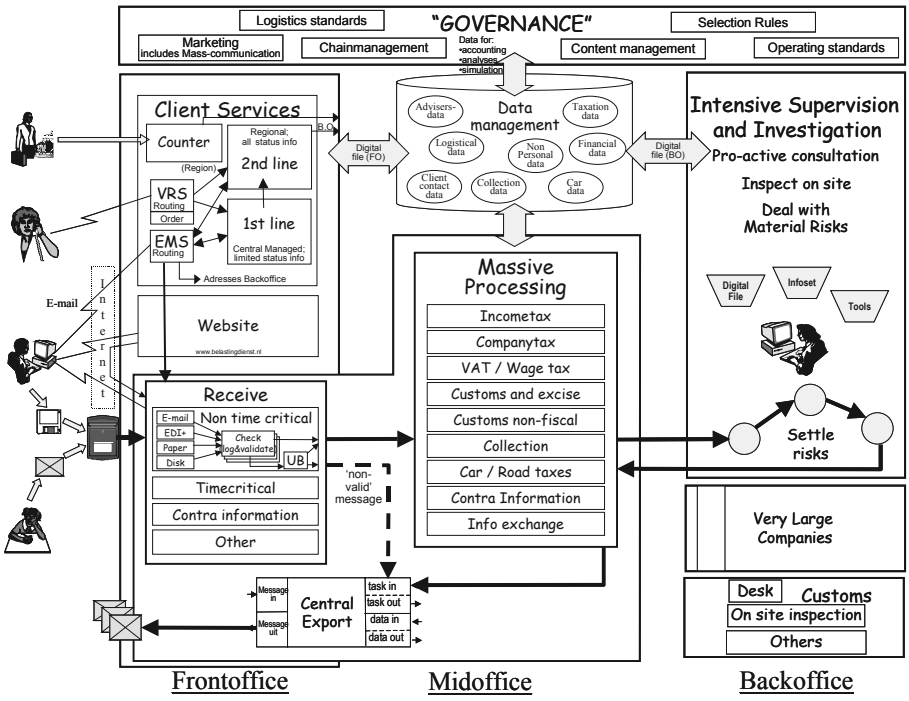
This chapter contains three discussions related to this dissertation. The first discussion deals with the way in which the Administration should enhance the way it faces the Digital World (5.1). The second discussion handles how the concepts of communication as used within this research relate to the field of mass communication (5.2). The last discussion handles the way organisations can apply the theoretical framework and the conclusions to find out how they should face the Digital World (5.3).

## 5.1. The Administration facing the Digital World

This section proposes how the Administration should enhance the way it faces the Digital World right now. The Administration (its board, to be precise) puts forward that in the next few years it will focus on changing from a document oriented government to an electronic government. In conclusion, the Administration will focus on the innovation of client services and supervising duties. During this period attention will be given to the further development and streamlining of the client services processes. At the same time attention will be given to the investigating and supervising duties…. To process massive data and document flows fast the Administration will also give attention to the arrangement of massive processing[57] in the next years.

The core business of the Administration will no longer be grouped on the basis of clients (target groups) but on the basis of processes. In other words processes, or steps within processes have become the most important discriminator in how the Administration intends to apply the horizontal division of tasks in order to design - what Mintzberg calls - the organisational superstructure. Within this new superstructure the Administration determines three major process groupings:
- client services
- intensive supervision and investigation
- massive processing.

. . . . . .
57 Deduced from Bedrijfsplan 2001 - 2005




The figure shows that massive processes and intensive supervision and investigation are all connected to client services. Client services themselves are situated in the Administration's front office. Part of this front office is virtual, i.e. connected to the Internet. The picture shows that the information services will be connected to a process called *Web Site*. Communication process will be connected to a process called *Electronic Message Service*. And transaction services will be connected to a process called *Receive.*

Below an abstract is presented of the objectives of the client process as captured in a conceptual version of what is called the 'development agenda' (third version, 12th of June 2001):

- Client services
  - Enabling e-mail: in 2003 it will be possible to e-mail the Administration for all possible communication. The response time will be 48 hours in eighty per cent of all cases; in all other cases the response time will be 120 hours. Customs will respond within 30 minutes in those cases in which e-mail is complementary to fax.
  - Information services via the Internet: in 2003 seventy-five per cent of all taxpayers with access to the Internet will use www.belastingdienst.nl to find answers to non-personal questions. In eighty per cent of these cases the taxpayer will find the appropriate answer to his question by himself. In 2003 two types of personal information will be retrievable via the Internet: payment information and trace and tracking information.
  - Electronic transaction services: in 2003 it will be possible to use Internet forms for the majority of transactions. Several Customs-related transactions can be taken care of electronically: such as export (now and 2003), periodical declaration (2003), import (now and 2003), transit (2004).
  - Increased use of Internet: in 2005 fifty per cent of all taxpayers will use the Internet to communicate with the Administration, check trace and tracking information or perform transactions. Seventy per cent of all questions can be answered via 'self-service' tools.

In December 2000 the board decided, among other things, to make several changes to both organisation and management[58]. The board believes that the situation was such that it was both desirable and practicable to dissolve divisional management and replace it with a council situated between the management board and the several operational units of the Administration.

One of the Administration's aspirations is to create seventeen units that cover several regions within the Netherlands. The core business of all these large operational units will be client services and intensive supervision and investigation. The board believes that the operational units should be given a certain margin to work things out for themselves. Therefore, there will be some variation as to how the operational units will design their task completion. Some operational units will focus on call centres or e-mail centres. Others will focus on front desks in order to meet taxpayers in real life.

Although the above shows that variables that tend to type B are applied for the Administration as a whole[59], the variables that relate to the virtual front office itself seem to focus on a reduction of uncertainty and a decrease of independence:

- Separation: marketing, content management and selection standards are separated from - amongst others - the client processes and transferred to the ‘governance’ layer (see picture).
- Standardisation, all three services will be supported by specified (see objectives) and generalised (see picture) processes: communication services to *EMS Routing*, information services to *Web Site* and transaction services to *Receive*.

The exact degree of separation and standardisation remains unclear because the details have yet to be produced. However, as it comes to the virtual front office, there is an explicit intention to reduce uncertainty and to decrease independence. This points at the continuation of the present situation, namely that the structural couplings with the Digital World will still be supported by applying variables that tend to type A. This means that as soon as one of the Virtual Spaces the Administration intends to connect to changes, again, it won’t be able to adapt to them.

Therefore, the Administration should increase the degree to which it applies type B variables to its virtual front office, to prevent that it gradually becomes less adaptable. Both now and in the future. However, the Administration as a whole should not turn into an extreme type B organisation. It aspires to enforce legal security and equal justice in all its actions, and to achieve this it has to focus on constant processes. Therefore, the Administration needs to be an organisation that tends to type A. It is possible, however, to increase the type B variable selectively, for the sake of a flexible front office and without endangering the type A organisation as a whole. The Administration could achieve this as follows:

- High-level decentralisation; hosting the services by the existing organisational units insufficiently supports the adaptability of the virtual

58 Memorandum Belastingdienst Straks

59 An increasing decentralisation, delegation and participation: by dissolving management, designing seventeen independent regional units, with a certain margin to work to their design own task completion.

front office. Instead, a single organisational unit needs to be created that is completely dedicated to operating the virtual front office. The organisational unit is to cover the operation of information services, communication services, transaction services and distribution services, both functionally and technically.
- Low-level separation; the dedicated unit is not only to cover operational tasks, but also tasks related to design and implementation of the virtual front office services.
- High-level functionalisation; the teams within the organisational unit should operate in an organisation that lacks a clear single line of command, for instance a matrix organisation with lines of command grouped alongside the four virtual front office services and lines of command grouped alongside innovation, implementation and operations.
- High-level delegation and participation: the teams within the organisational unit need a short chain of command. The teams should have wide margins to give shape to their own task completion.
- Low-level standardisation: contributions to the Digital World are often unpredictable and complex. Adopting such contributions may well ask for improvising and for 'bending of rules'. Low-level standardisation has to assure that there is enough room for improvisation and flexibility.

## 5.2. Discussing the conceptualisations of communication

Chapter 1.1.2 stated that communication models can only be applied or tested in specific communicational situations, depending on how communication is conceptualised from the creator's point of view, i.e. conform the statements of the creator of a model about what communication does and means. Within this dissertation, conceptualisations were drawn and applied on organisations that use Internet communication media. Within this dissertation communication is referred to as an *enabler*. Communication enables humans to interact and adapt to a changing environment, and vice versa. As such, the conceptualisations can be classified as so-called *second-order cybernetic theories*, a school of thought which tried to overcome the critical comments from communication scholars on 'traditional' cybernetic theories – the latter do not recognise that communication can and sometimes should have the power to transform the structures or long-term goals of systems (Baran and Davis, 2000). Baran and Davis argue:

"We stand on the threshold of a revolution in our understanding of ourselves as biological organisms…. As a result, mass communication theory will have to accommodate these new understandings." (Mass Communication Theory, 2000, page 354)

Although it goes beyond the scope of this research, it needs further discussion whether or not the conceptualisations within this research - as a counter movement to the argument of Baran and Davis - can be applied within the field of mass communication. At the same time needs to be discussed whether or not mass communication accommodates Internet communication media.

The field of mass communication contains many theories. For example McQuail (1983) who determines four characterisations of mass

communication: the media institutions, the mass communication process, the mass concept, and mass culture:

- *Media institutions* are concerned with producing and distributing knowledge - information, ideas, and culture. Secondly, they provide channels for relating certain people to other people. Thirdly, the media operate almost exclusively in the public sphere. Fourthly, participation in the institution as an audience member is essentially voluntary.
- The *communication process* which takes place in the framework of an institution can only be described by exaggerating certain features of it and, especially, by contrasting it with face-to-face communication between persons. Thus the source is not a single person but a formal organisation, and the 'sender' is often a professional communicator. The message is not unique, variable and unpredictable, but often 'manufactured', standardised, always multiplied in some way. The relationship between sender and receiver is mostly one-way and rarely interactive; it is necessarily impersonal and often perhaps 'non-moral' and calculating, in the sense that the sender does not accept the responsibility for specific consequences for individuals. Mass communication often involves simultaneous contact between one sender and many receivers.
- The *mass concept* does not refer to being a part of a group, a crowd or a public, but to being part of something bigger than that: the mass. Being part of a mass, individual members cannot take notice of the 'boundaries' – in contrast to the members of a group, a public or a crowd.
- *Mass culture* is often used to describe the typical content produced and disseminated by the media. Mass culture has negative and positive connotations. The most neutral approach is that mass culture refers to what is modern, topical, interesting, and fashionable at a certain moment.

To find out whether or not the conceptualisations of communication as put forward in this research match the four characteristics mentioned above, the conceptualisations are broken down into ten key-elements:

1. humans, people, groups
2. deploying channels
3. while exchanging messages
4. with other people or groups
5. or within groups
6. that have informational aspects
7. and relational aspects
8. … in order to anticipate structural changes within the environment, which includes other humans or groups, so that preservation of the relation with the environment is possible
9. … or in order to provide information to the environment and thus in turn giving the environment the opportunity to adapt to the provider of information
10. … or in order to maintain or adapt the structural relationship within the group.

Next, it is attempted to match every single element with one or more of the characterisations of mass communication.

The characterisation of media institutions, to start with, matches with the following elements: (6) informational aspects, (7) relational aspects, (3) messages, and (2) deploying channels. The other two elements of media

institutions (public sphere, essentially voluntary) do not correspond to the conceptualisation. However, neither does the characterisation of media institutions fully match the elements of Internet communication media, as the latter is not exclusively deployed in the public sphere, for instance when messaging applications are used. Moreover, with Internet communication media an 'audience' is difficult to determine, nor is using Internet communication media essentially voluntary, since nowadays Internet technology includes e-learning applications.

The communication process (the second characterisation) is described as the opposite of face-to-face communication. One could conclude that communication processes as described can't really be applied to the Internet, since the latter is a mixture of interpersonal and mass communication media. In spite of this, the conceptualisation of communication as proposed within this research does to some extent fit the description of mass communication, which is essentially a one-way process. Namely, key element 8 (in order to anticipate structural changes within the environment….) and 9 (in order to provide information to the environment …). Both include one-way and two-way communication.

The mass concept referred to being part of the mass. The conceptualisations do correspond to this element of mass communication. In the conceptualisation one is never part of the mass – as in not seeing the boundary - but one opposes the mass, i.e. the environment. As such one can always distinguish the boundary between the individual and the mass.

Mass culture referred to what is modern, topical, interesting, and fashionable at a certain moment. This characteristic of mass communication matches best with key element 8 (…structural changes within the environment….) Structural changes include, among others, topicality, and they also cover changes in what Anghern referred to as the Virtual Transaction Space - as there are new standards of payment such as e-cash.

From the above the conclusion can be drawn that, to some extent, the conceptualisations of communication in this dissertation fit the description of mass communication as characterised by McQuail, but not completely (mass concept). Then again, considering the flaws in the mass concept and the communication process with regard to the Internet, mass communication does not fully correspond to the media environment that formed the basis of the conceptualisations in this dissertation either.

### 5.3. Organisations facing the Digital World

This paragraph ends with a few words on how our real world has an effect on the Digital World. But before that it is discussed how the theoretical framework and the conclusions can be applied by organisations that face the Digital World. This discussion is based on the following fundamental idea, which has been developed in this dissertation:

> In an effort to carry out the organisation's mission as effectively as possible the strategic apex will decide to create a channel to the Digital World as soon as it observes that the organisation's regular environment is turning to the Digital World. It does this by implementing a virtual front office. Once the organisation and one of the Virtual Spaces have started to adapt to each

other via that channel, they create a structural coupling. In order to maintain that structural coupling the organisation aims to adapt its virtual front office every time one or more of the four Virtual Spaces that the organisation is connected to starts to change. Otherwise the organisation will lose its structural coupling with it. When that happens, the organisation can no longer adopt the contributions that are introduced into the Digital World, i.e. it will lose access to the opportunities the Digital World provides.

However, a virtual front office becomes less and less adaptable the more the structural coupling(s) is connected to the organisational structure by applying variables that tend to type A.

Moreover, an organisation which implements its virtual front office services into its organisation by applying variables that tend to type A, is hesitant to create a full structural coupling with that particular Virtual Space of the Digital World that covers the domain of its core business the most.

Next to that, an organisational structure changes when a virtual front office provides communication services. Moreover, a virtual front office that is connected to the organisational structure by applying variables that tend to type A will start to focus on controlling communication flows once the virtual front office provides a structural coupling with the Virtual Communication Space.

***Maintaining a structural coupling with the Digital World***

As Mintzberg (1983) put it, organisations choose their environment. As such, they choose the Digital World as an environment too. Organisations choose environments because they possess something that the organisation wants to obtain, for instance supplies, money, customer needs, or knowledge. In return, organisations offer something to their environment. The Digital World, like the real world, is not a homogeneous environment. It can be divided into several Virtual Spaces that cater for, for example, Information, Communication, Transaction and Distribution. Per Virtual Space three contributions can be distinguished:

- technology, i.e. the Internet network and Internet communication media;
- utilisation;
- users.

The contributions constantly generate changes that impose demands on the adaptability of organisations. A virtual front office has to keep pace with the changes, i.e. new or altered contributions, in one or more of the four Virtual Spaces of the Digital world it is connected to. Otherwise the organisation will lose its structural coupling with it. As such, the organisation no longer can adopt the contributions that are introduced into the Digital World, i.e. it will lose access to the opportunities the Digital World provides. Once a virtual front office no longer can keep pace it is considered to have become less adaptable. However, the adaptability of the structural coupling is not only distinguished by whether or not a virtual front office shows difficulties in adopting new contributions to those Virtual Spaces with which it has already established a structural coupling with. But also whether or not it:

- increasingly focuses on controlling the interactions with the Digital World that flow from: A) contributions that have already been adopted from the Digital World, or B) contributions introduced into the Digital World by the organisation itself.

- can adopt new contributions to the Digital World at all.

Hill, Fehlbaum, and Ulrich (1998), distinguish two ideal or extreme organisational types, which are situated on the opposite ends of the same line. Type A has a high potential for routines and a low potential for problem solving. Type B has a low potential for routines and a high potential for problem solving. Type A aims at high rate *first-order productivity*. First-order productivity focuses on constant processes. Type B aims at high rate *second-order productivity*. Second-order productivity focuses on processes of permanent or mutating change. At the same time, type A aims at what is referred to as *high safety levels*. And type B at what is referred to as *high levels of independence*. Safety levels refer to the level of shielding organisational participants from uncertainty and unexpected environmental reactions. Levels of independence refer to the extent to which organisational participants can decide on how to perform their labour without being exposed to over-taxation that leads to uncertainty or fear. Hill, Fehlbaum, and Ulrich (1998), refer to the following variable instruments to support first-order vs. second order productivity, and security vs. independence - i.e. *organisational structure; the sum of the ways in which an organisations labour is divided into distinct tasks and the way in which co-ordination between these tasks is achieved* - as follows:

| **Type A Variable level** | **Instrument** | **Type B Variable level** |
|---|---|---|
| Low | Decentralisation | High |
| Low | Functionalisation | High |
| Low | Delegation | High |
| Low | Participation | High |
| High | Standardisation | Low |
| High | Separation | Low |

Organisations that belong to type A or B are ideal, or extreme constellations. In reality, as Hill, Fehlbaum, and Ulrich (1998) state, organisations are a mixture of type A and B. Some organisations apply more variables that tend to type A, others prefer type B.

Organisational structures have different degrees of flexibility and this conditions the course of their interactions. Organisations that apply type B variables will show a higher degree of flexibility than organisations that apply type A variables, as type B is designed to anticipate permanent evolutionary or mutating change. Organisations that apply variables that tend to type A are not designed for that purpose. They focus on constant organisational processes. As such, a type A organisational structure is rigid.

As already mentioned, a virtual front office has to keep pace with the changes in one or more of the four Virtual Spaces of the Digital world it is connected to. Because once a virtual front office no longer can keep pace it is considered to have become less adaptable. In that case it may well lose the structural coupling with one or more of the four Virtual Spaces. When this happens, the organisation no longer adopts the contributions that are introduced into the Digital World; i.e. it will lose access to the opportunities that the Digital World provides.

So, if an organisation chooses to connect to one or more Virtual Spaces of the Digital World, then the organisation should apply variables that tend to type B in order to support the structural coupling(s) provided by the virtual front office, instead of variables that tend to type A. Especially when connecting the core business.

To determine whether or not the variable level per instrument is sufficiently tending to B (mind that type A and type B are ideal types on a sliding scale), an organisation has to answer a simple question: "*Can our virtual front office keep pace with the relevant, sudden and extreme changes that occur in the Virtual Spaces it connects to?*" If not, the theory developed in this dissertation suggests that the type B variable level per instrument as presented in the table above should be increased.

This can be achieved by creating a separate organisational unit that completely focuses on hosting the virtual front office. This unit should be granted as much independence as possible from the rest of the organisation, i.e. without endangering the productivity of the organisation as a whole.

To make sure that an organisation can keep up with the changes in the Digital World, especially relevant, sudden and extreme changes, a process should be designed and a team should be set up to monitor the Virtual Spaces that the organisation is connected to.

***Government usage of Internet communication media***

An organisation that intends to create and maintain a structural coupling with the Virtual Communication Space should be aware of what Turkle (1997) referred to as exaggerated likes or dislikes that occur when users meet via computer mediated communication. Whether or not this happens may depends on the degree of convergence between users, the extent to which a communication continuum, as proposed by Rogers and Kincaid (1981), is established. The degree to which convergence occurs is possibly accommodated by:

- The trigger that initiated communication; a single or a repetitive need.
- The technical accommodation; a-synchronous as in e-mail or synchronous as in chat technology.
- The subject of communication; is it a solid subject or is the subject still due to change with respect to its content.

In this research it is proposed that convergence or the continuum are more likely to last in the case of repetitive need, synchronous communication technology and subjects that are still due to change with respect to its content.

Supporting convergence and creating a communication continuum may be very tempting for private enterprises. It may attract (potential) customers by creating an atmosphere of trust and intimacy. Increased trust and intimacy probably increases the willingness of users to engage in a transaction. But trust and intimacy can also cause objectivity to fade away and end in exaggerated likes or dislikes thus fostering bias. As such, a thesis can be put forward that the application of computer-mediated communication to interpersonal interaction possibly fosters bias.

To understand why bias especially endangers a typical form of organisations, namely governments, the concept of authority is to be taken into consideration. Governments need some sort of authority in order to function appropriately. Authority can be defined as the chance of following someone's specific orders or the chance of following all of his orders. From

such a point of view authority is built on voluntary action towards someone that is in charge and gives orders. It is necessary for the conservation of any authoritative relationship that there is the smallest amount of willingness to obey or to take some sort of interest in obeying someone. For the sake of effective and efficient governing those who are subject to authority must be convinced that those who exercise authority are legitimate to do so. (Weber, 1922).

Regardless of using the Internet or not, there are three possible standpoints for governments (Rosenthal et. al., 1987) from which they can embark on interaction with citizens and enterprises based on their authoritative relation towards them, and in which now and then their legitimacy is put to the test. The first is to see citizens and enterprises as *participants* (Barnes, 1979, and Milbrath and Goel, 1977) the second is to see them as *subjects* (Thomassen, 1979) or the third - a far less oppressive expression - *customers* of government.

When interacting in the participant domain, governments want citizens and enterprises to have a say in how a community is governed; i.e. a country, state, municipality, etc. Such interactions for instance take place when politicians take counsel with their own party members. Other examples of participant-based interactions are campaigning during elections; lobbying for industrial interest or for the interest of non-governmental organisations such as Greenpeace and Warchild; or even via recruitment of public servants (Krislov, 1974, and Hoogerwerf, 1986). As for electronic governments, the participant domain manifests itself within for instance electronic platforms such as Citizens Space (http://www.ukonline.gov.uk/online/citizenspace/), or the IPM (2001) initiative of the European Commission.

In the customer domain, governments communicate with citizens and enterprises because they are subject to legislation, regulation, permissions, etc., but also because they give information, for instance when they have witnessed a crime or when they take part in national surveys. Or because they provide government with money, i.e. taxes and fines. Moreover, citizens are customers of safety, health care and social security. And enterprises are customers of financial aid, for example innovation subsidies or economic protection. An example of how electronic governments can contribute to this domain is the application of 24/7 information access via the Internet.

In both domains bias can be a hazard to the legitimacy of a government's authority over citizens and enterprises. For instance, in the domain of participants, once citizens feel ignored by the established political parties because it turns out that those parties only act for the benefit of the happy few, they will give their (protest) vote to another party at the next election or worse: they may turn away completely from politics and stop voting altogether. As for the customer domain, if the Inland Revenue service levies far more tax on me than on my competitor, then why should my co-operation be compliant and keep paying taxes at all?

Several governments are taking measures that prevent bias towards citizens. The Dutch Government, for instance, passed a law - Algemene wet bestuursrecht - that says that every public service has to complete its task without bias. Moreover, the public services themselves see to it that not a single person who could take a personal interest is involved in any decision-making process (Kluwer, 1998).

However, there is this hypothetical backfire that lies lurking: the application of computer-mediated communication to interpersonal interaction may fosters bias. This backfire probably isn't very hazardous for governments as long as computer-mediated communication between them and citizens sticks to simple, low-level information that isn't likely to be argued about. Such as, for instance, frequently asked questions and comments on a web site. But what if the subject of computer-mediated communication becomes controversial and delicate. What if repetitive needs for communication surface? For example, in case of complaints. What if decisions related to an individual situation have to be taken? Especially in those more complicated cases - in which a communication continuum is established - it is necessary for governments to act on an absolute no-bias base for the sake of their own legitimacy.

As for the participant domain, it can't be that no attention is paid to a citizen's argument simply because he is new to an electronic platform and therefore still a little clumsy in his communication style – in comparison with the platform's standard communication style. It also can't be that citizens who take part in a discussion group face false expectations because the discussion leader pretends to be the president's envoy while in fact he is 'just' an average public servant without any real authority.

The same goes for the customer domain. It can't be, for instance, that a complaint of a particular citizen is taken care of much faster than other complaints merely because a public servant favours his style of writing. Or because a civil servant likes the fact that this particular citizen has an e-mail account at the same local provider. Or worse, it can't be that for similar reasons a complaint or a request for financial support isn't taken care of at all.

The thesis of a possible bias effect of computer-mediated communication hasn't been put forward to discourage public services from getting connected to the Virtual Communication Space of the Digital World. However, if governments don't take preventive measures against any possible bias side effects, for instance by defining clear discussion procedures, by implementing automated e-mail answering services or by seeing to it that public servants regularly rotate their customer base, then 'electronically bias' among staff may result in governments losing their legitimacy.

***In the end - a changing Digital World***

Not that the Digital World is welcoming institutions enforced by governmental organisations from the real world with open arms. As Barlow put it in his 1996 manifesto 'A Declaration of the Independence of Cyberspace' after the Telecom Reform Act had passed in the United States Senate:

*"Governments of the Industrial World, you weary giants of flesh and steel, I come from Cyberspace, the new home of Mind. On behalf of the future, I ask you of the past to leave us alone. You are not welcome among us. You have no sovereignty where we gather….. You claim there are problems among us that you need to solve. You use this claim as an excuse to invade our precincts. Many of these problems don't exist. Where there are real conflicts, where there are wrongs, we will identify them and address them by*

*our means. We are forming our own Social Contract . This governance will arise according to the conditions of our world, not yours. Our world is different."*

This dissertation put forward that an environment - i.e. the Digital World - in its turn has to adapt to the organisations of the real word too, in spite of Barlow's manifesto. The larger the number of organisations, individuals and interests that engage in the Digital World, the more and more triggers the Digital World will receive and these perturbations may force structural changes such as new social standards captured within institutions.

One example has already been mentioned – implicitly - earlier on, namely the case of Napster. In the middle of 2000 the Recording Industry Association of America and the National Music Publishers Association filed a motion for a preliminary injunction that tried to put an end to what seems common ground the Digital World: the violation of copyright, which is the exclusive right to manufacture, distribute, dispose of, and otherwise control copies of literary, musical, dramatic, pictorial or any other 'copyrightable' work. The law grants this right to composers, authors or publishers for a specific period (National Music Publishers' Association, 2001). In the end the record industry succeeded and Napster had to put a filter on its application.

Another 'Digital World standard' getting in the way of the social standards of the real world is freedom of speech. Freedom of speech may lead to the publication of, for instance, child pornography, 'sniffer' movies or hate speech, which is considered harmful or even criminal in several parts of the real world. A range of organisations such as the ICRA, the IWF, or Childnet International, was formed. These organisations aim to protect children from potentially harmful material, while protecting free speech at the same time, all on the basis of self-regulation. The catch is, on one hand, that users voluntarily implement a so-called filter in a web browser which uses a labelling list covering topics such as chat, the language used on the site, the nudity and sexual content of a site, the violence depicted on the site, or others such as gambling, drugs and alcohol (ICRA, 2001). On the other hand web site authors are invited to indicate whether a specific item or feature is present or absent on their site. As such, this catch is in line with 'solving our own conflicts', as Barlow would probably put it. However, the members of these organisations are all part of the real world, not the Digital World. As such, the Digital World receives a steady number of perturbations from the real world.

Technical changes are required too. For instance, the Administration demands from the Digital World that it can identify who is communicating and authenticate what is communicated. And that it can do that via secure lines, without any Peeping Tom. To make this possible, the Digital World has to come up with affordable (the Administration will not adopt techniques that are expensive to users) and user-friendly techniques. As long as these requirements remain unfulfilled, opening a channel to the Digital World amounts to giving my neighbour the chance to collect my tax refunds. Do you know him? Rest assured, he will take that chance.

In the end, it seems to me, not only that my natural habitat has been changed by the Digital World, but that my natural habitat has been and is changing the Digital World as well.

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# Appendix A - Half structured interviews

This section captures the frameworks of questions that was used during the half-structured interviews. The first framework concentrated on increasing the validity of the notes that were made via both participant observation and free attitude interviews. The first framework was as follows:

1. As a starting point, what are your own experiences with the Internet and since when do you use the Internet? For instance, do you use e-mail; do you surf on the web, etc? Also, what do you use the Internet for, spare time activities, working time, etc? What do you like most, what sites are your favourites?

2. Second, could you tell me why the Administration decided to engage in a so-called Net-presence? For example, was it to keep up with the rest or was it because of other reasons? What were these other reasons?

3. Next, I would like to talk about the way the Administration is using the opportunities the Internet offers. At this moment, information is offered and there are some possibilities to communicate with the Administration via e-mail. Are there any plans for the future to increase the possibility to communicate and second, do you know if there are any plans to enable transaction services via the Internet, instead of what is now is called the tax declaration software? If so, can you predict when this is going to happen en which units within the Administration will be involved in it and why?

4. The next few minutes I would like to talk about the possible impact of the Internet on our world. To start with ourselves, what do you think will be the impact of the Internet on the Administration? For instance, will it force the Administration to fully participate in the 7 times 24 hours economy? How do colleagues react to such a statement?

5. I would like to spend little time on the legal issues concerned with electronic communication. First of all, was there any hesitation when the Administration decided to open a few e-mail channels? I.e. within the framework of the legal aspects of electronic communication?

6. I would like to end this interview with spending a little time on the way the Administration is implementing the Internet into its organisation. First of al, can you tell me what the Digibel program is all about and why it is decided to in source Internet activities via DIEC?

For the time sampling the following framework was designed:

1 As a starting point, can you tell - estimate - if the number of e-mail messages this department has taken care of has gone up?
2 Who is taking care of the e-mail messages?
3 With regard to those e-mail messages, were there any so-called double or triple loops (or more) involved?
4 Can you tell me how you generate an answer to a question? Do you apply a FAQ answer database?
5 With regard to the other departments that take care of e-mail messages; has there been any contact and what was it about?

# Appendix B - Free attitude interviews

The section below captures the questions that were asked during the free attitude interviews.

1. What features does this script have?
2. What features does Sylverstream have?
3. What is the bandwidth from the server to the NLnet/UUnet backbone?
4. What applications are in the CGI-BIN directory?
5. How many e-mail accounts are there under the domain belatingdienst.nl?
6. Who is the administrator of the domain www.belastingdienst.nl?
7. Can I have a username and password to the statistics?
8. Does this server feature front page extensions?
9. What was the organisational approach before the division structure had been established?
10. Which are the five primary divisions of the Administration?
11. What are the conditions for outsourcing activities?
12. What are the conditions for hosting activities within staff organisations?
13. What trends in society do affect the Administration?
14. What demands do taxpayers have when they engage the Administration?
15. What differences between taxpayers have been considered?
16. Why was it decided to in-source the Internet activities?
17. Who decided to in-source the Internet activities?
18. When was decided to in-source the Internet activities?
19. Who was ordered to guide the in-sourcing of the activities?
20. How long should the in-sourcing of activities take?
21. What are the tools to create HTML pages?
22. What are the tools to upload HTML pages?
23. Is there any documentation on the PDCSNS-script?

24. Whom do we have to contact when an error occurs within the script?
25. When is the fixing of the script scheduled?
26. Can't we replace this script with a standard tool?
27. What are the critical activities to host www.belastingdienst.nl?
28. At what moments do we get a content check from our commanding client?
29. At what moments did PDC get a content check from their commanding client?
30. Who is responsible for making sure whether content is due to tax legislation or not?
31. Who was responsible for making sure whether content was due to tax legislation or not during there period the EIO was hosted at PDC?
32. What role does the tax-oriented editor have within the EIO?
33. Are there still tax oriented editors within the EIO?
34. What backgrounds do the EIO editors have?
35. Does this server support extensions?
36. Why did the Administration obtain this server?
37. What browsers and what versions are to be supported?
38. Why are these browsers and versions to be supported?
39. What are the browser specifications?
40. Why do we have to provide "tailor-made" services towards taxpayers?
41. Is there a problem with the fact that in the case of "personalised services" we can analyse all web site related activities of taxpayers?
42. Does this possibility scare the taxpayers who visit our site?
43. Why do we have to document as many of the activities we perform as possible in such detail?
44. Does our commanding client manage by results or by activities?
45. Are there any political conflicts known between divisions that we should anticipate?
46. What is Digibel's main task?
47. Why do the EIO activities have to separated to a functional level?

48. Why are we teamed up with former EIO members?

49. Is is not possible to perform the manual activities such as checking the hyperlink integrity automatically by using common software?

50. What if it isn't possible for some reason?

51. What web management will we obtain that synchronises our development with the publishing environment?

52. What are the processes to be distinguished within BDP?

53. What does the process 'Acceptance' refer to?

54. What does the process 'Document maintenance' refer to?

55. What does the process 'Information retrieval' refer to?

56. What does the process 'Editing and publishing' refer to?

57. How many editing processes are handled by BDP?

58. Do the editing processes look alike or not?

59. Is it possible to separately store content from carrier?

60. Are there any Internet related editing tasks to be distinguished from other editing tasks?

61. Who was advising commanding clients when the EIO was hosted at PDC?

62. Who has to advise commanding clients now that the EIO is hosted at DIEC?

63. Who has to advise commanding clients now that the EIO is hosted at B/CKC?

64. What is the task specification of the team leader?

65. What is the task specification of the project managers?

66. What is the task specification of the editors?

67. What is the task specification of  the team web masters?

68. What is the task specification of the the team leader?

69. What is the task specification of the web designer?

70. What is the task specification of the network operator?

71. What is the task specification of the program writers?

72. What is the task specification of the aspect managers?

73. What is the task specification of the cost account managers?

74. Since when do EIO members have to register their working time?

75. What tasks does ‘maintenance of the Customs web site' consist of?

76. What tasks does ‘maintenance of the Private Taxpayers web site' consist of?

77. What tasks does ‘maintenance of the Business Taxpayers web site' consist of?

78. What tasks does ‘handling web site generated e-mail’ consist of?

79. What tasks does ‘coding’ consist of?

80. Why has program writing been transferred from the EIO?

81. Why has web site development been transferred from the EIO?

82. How did the EIO at PDC gather tax-related news?

83. How were task grouped within the EIO when the EIO was hosted at PDC?

84. How are task grouped within the EIO now it is hosted at DIEC?

85. How are task grouped within the EIO now it is hosted at B/CKC?

86. Who is considered to be in charge of the product department unity-of-command?

87. Who is considered to be the functional department unity-of-command?

88. Were there EIO members at PDC that were constantly assigned to one client?

89. What is delegated within the framework of content?

90. What is delegated within the framework of handling e-mail?

91. What is delegated within the framework of editing?

92. What is delegated within the framework of program writing?

93. Who is in charge of developing information retrieval concepts?

94. Who is in charge of developing new web applications?

95. Who is in charge of developing text standards?

96. Why isn’t it possible to change the web site interface?

97. Why can’t we replace the search engine?

98. What is the standardised answer to this e-mail question?
99. Under what condition do I have to forward a message to the commanding client?
100. When is this site due to be published?
101. What is the publishing deadline of this site?
102. Who has the brochure order codes?
103. What are the brochure order codes per brochure?
104. Who takes care of handling the orders?
105. What is the interval of forwarding the brochure ordering batch files?
106. Who is in charge of developing our digital house style?
107. Who has to update the File Transport Protocol step-by-step manual?
108. Can we alter this PERL script?
109. Can we replace this Java scripting?
110. How do you convert Word documents to HTML documents?
111. Do we have to put these agreements on paper?
112. Did anyone read this project scheme?
113. Are these documents signed?
114. Why has he been pulled away from the project?
115. Does this site have a transfer document?
116. Why is this site not accepted by the EIO?
117. Is there no source code?
118. Who is in charge of releasing web site statistics?
119. Can we publish these statistics straight away?
120. Who has access to the web site statistics?
121. Why are the web site statistics to be screened first?
122. Who takes care of screening the web site statistics?
123. When was PDC founded?
124. What budget is to be spent on development at DIEC?
125. What budget is to be spent on development at B/CKC?

126. Why were EIO members at PDC shifted from one client to another?

127. Why are EIO members at DIEC shifted from one client to another?

128. Are EIO members at B/CKC shifted from one client to another?

129. What were EIO applicants screened for when the EIO was hosted at PDC?

130. What were EIO applicants screened for when the EIO was hosted at DIEC?

131. What were EIO applicants screened for when the EIO was hosted at B/CKC?

132. How did you (general project manager DIEC) encourage an innovative culture?

133. How did you (account manager PDC) encourage an innovative culture?

134. What were the EIO inputs when the EIO was hosted at PDC?

135. What are the EIO inputs now that the EIO is hosted at DIEC?

136. What are the EIO inputs now that the EIO is hosted at B/CKC?

137. What were the EIO outputs when the EIO was hosted at PDC?

138. What are the EIO outputs now that the EIO is hosted at DIEC?

139. What are the EIO outputs now that the EIO is hosted at B/CKC?

140. Under what conditions are we enhancing our routines?

141. What are the specifications of text files and graphics?

142. Why do we also publish RTF format?

143. What are the categories related to the web site generated e-mails?

144. Which department takes care of what e-mail message category?

145. How often did you have to handle double loop sessions?

146. How often did you have to handle triple loop sessions?

147. When was the Administration web site first published?

148. Under what domain was the Administration web site first published?

149. What efforts were made within the framework of providing digital information before getting on the Internet?

150. What are the numbers of incoming e-mails at the EIO between 1997 to 2000?

151. What are the numbers of incoming e-mails related to the Private Taxpayers call-back service from 1997 to 2000?

152. What are the numbers of incoming e-mails related to the Business Taxpayers call-back service from 1997 to 2000?

153. What are the numbers of incoming e-mails related to the Custom's e-mail service from 1998 to 2000?

154. What are the numbers of incoming e-mails related to the B/SEB's e-mail service from 1996 to 2000?

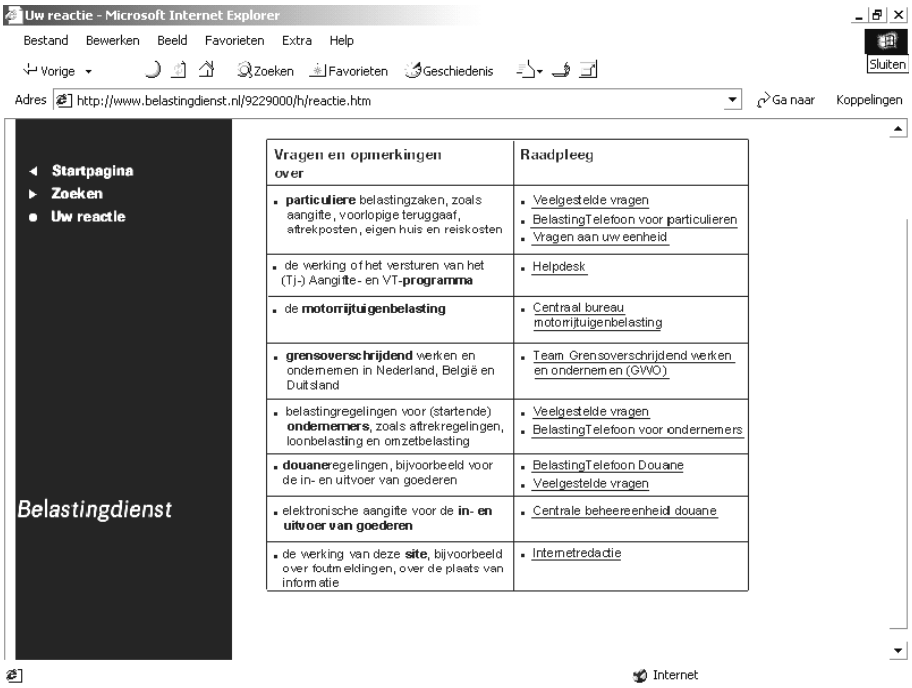
155. What are the numbers of incoming e-mails related to the job openings at B/AC from 1996 to 2000?

156. What are the numbers of incoming e-mails related to the job openings at Administration from 1998 to 2000?

# Appendix C - Additional data on www.belastingdienst.nl

Communication service items 2002

http://www.belastingdienst.nl/9229000/h/reactie.htm



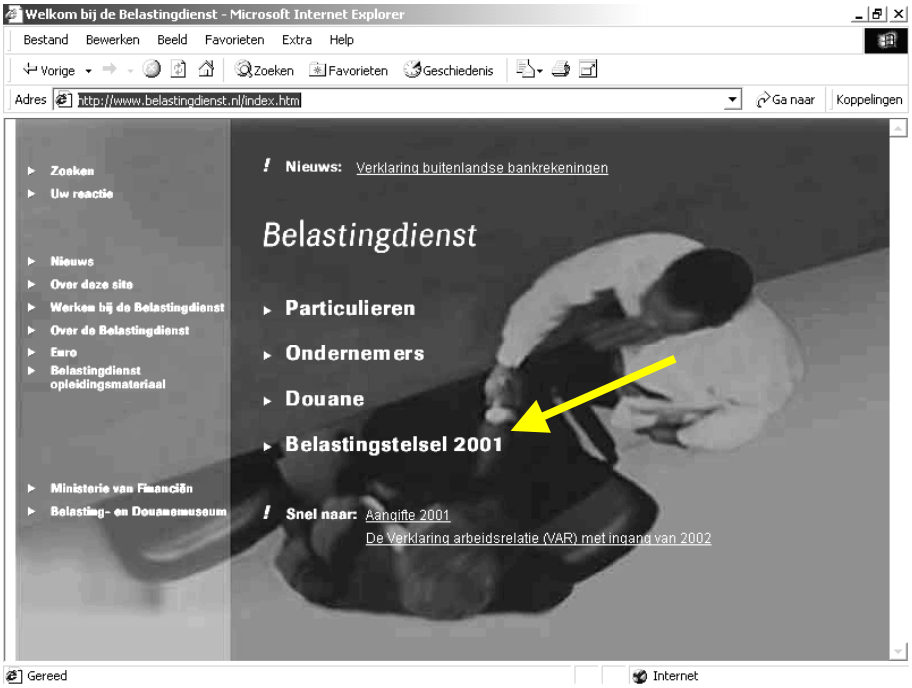

| Vragen en opmerkingen over | Raadpleeg |
|---|---|
| ▪ **particuliere** belastingzaken, zoals aangifte, voorlopige teruggaaf, aftrekposten, eigen huis en reiskosten | ▪ Veelgestelde vragen<br>▪ BelastingTelefoon voor particulieren<br>▪ Vragen aan uw eenheid |
| ▪ de werking of het versturen van het (Tj-) Aangifte- en VT-**programma** | ▪ Helpdesk |
| ▪ de **motorrijtuigenbelasting** | ▪ Centraal bureau motorrijtuigenbelasting |
| ▪ **grensoverschrijdend** werken en ondernemen in Nederland, België en Duitsland | ▪ Team Grensoverschrijdend werken en ondernemen (GWO) |
| ▪ belastingregelingen voor (startende) **ondernemers**, zoals aftrekregelingen, loonbelasting en omzetbelasting | ▪ Veelgestelde vragen<br>▪ BelastingTelefoon voor ondernemers |
| ▪ **douane**regelingen, bijvoorbeeld voor de in- en uitvoer van goederen | ▪ BelastingTelefoon Douane<br>▪ Veelgestelde vragen |
| ▪ elektronische aangifte voor de **in- en uitvoer van goederen** | ▪ Centrale beheereenheid douane |
| ▪ de werking van deze **site**, bijvoorbeeld over foutmeldingen, over de plaats van informatie | ▪ Internetredactie |

Enlargement

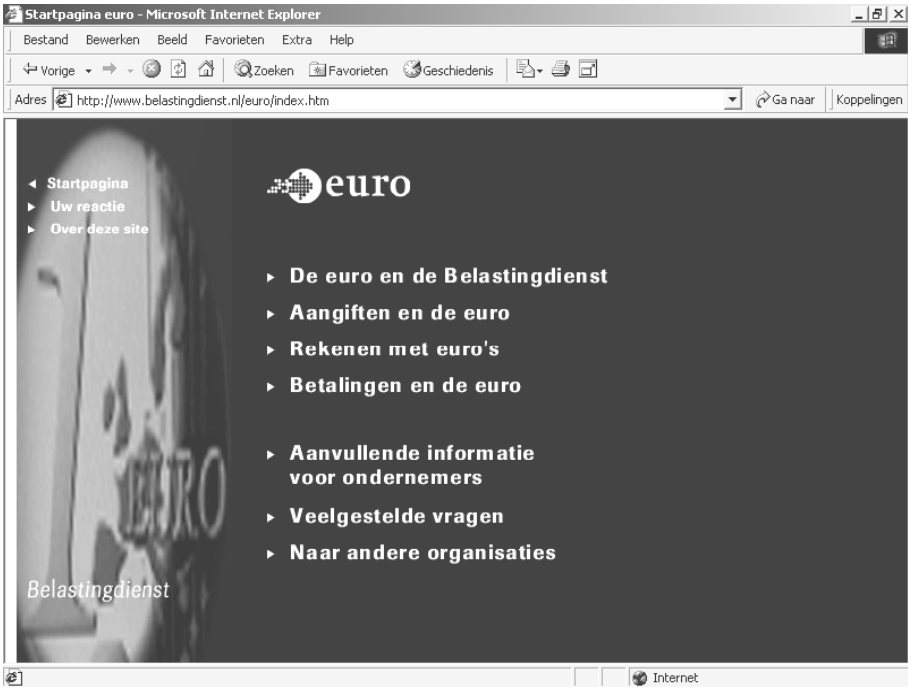
| Vragen en opmerkingen over | Raadpleeg |
|---|---|
| ▪ **particuliere** belastingzaken, zoals aangifte, voorlopige teruggaaf, aftrekposten, eigen huis en reiskosten | ▪ Veelgestelde vragen<br>▪ BelastingTelefoon voor particulieren<br>▪ Vragen aan uw eenheid |
| ▪ de werking of het versturen van het (Tj-) Aangifte- en VT-**programma** | ▪ Helpdesk |
| ▪ de **motorrijtuigenbelasting** | ▪ Centraal bureau motorrijtuigenbelasting |
| ▪ **grensoverschrijdend** werken en ondernemen in Nederland, België en Duitsland | ▪ Team Grensoverschrijdend werken en ondernemen (GWO) |
| ▪ belastingregelingen voor (startende) **ondernemers**, zoals aftrekregelingen, loonbelasting en omzetbelasting | ▪ Veelgestelde vragen<br>▪ BelastingTelefoon voor ondernemers |
| ▪ **douane**regelingen, bijvoorbeeld voor de in- en uitvoer van goederen | ▪ BelastingTelefoon Douane<br>▪ Veelgestelde vragen |
| ▪ elektronische aangifte voor de **in- en uitvoer van goederen** | ▪ Centrale beheereenheid douane |
| ▪ de werking van deze **site**, bijvoorbeeld over foutmeldingen, over de plaats van informatie | ▪ Internetredactie |

Information service items.

http://www.belastingdienst.nl/index.htm

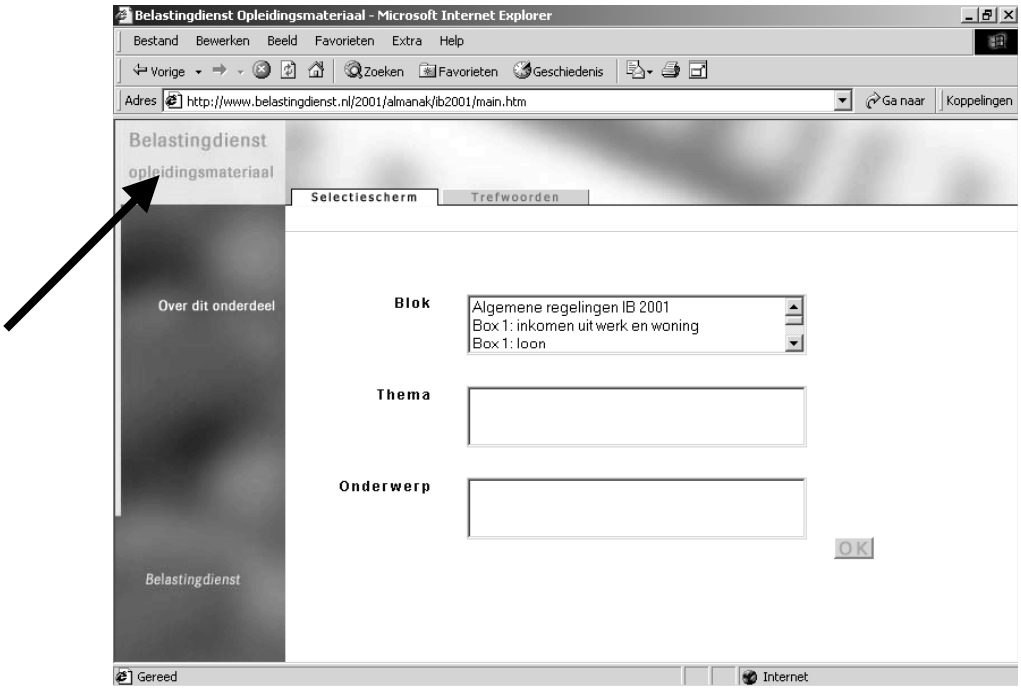



http://www.belastingdienst.nl/euro/index.htm



http://www.belastingdienst.nl/2001/almanak/ib2001/main.htm

Educational material



# Appendix D - Samenvatting in het Nederlands

In het midden en aan het einde van de jaren negentig speelde de gedachte dat het internet de wereld ingrijpend zou veranderen. Het internet zou bij wijze van spreke organisaties van de ‘Oude Economie’ wegvagen. Vooral de wat starre organisaties, zoals bijvoorbeeld bureaucratieën  Bureaucratieën, dan wel organisaties die de bureaucratie naderen, zijn talrijk. Met name binnen de overheid. Daarmee werd het relevant om een verkenning te starten naar wat er gebeurt als dit soort organisaties bijvoorbeeld een internetsite in gebruik neemt of via e-mail gaat communiceren. Dit onderzoek reikt hiervoor een theoretisch kader aan dat in een casestudy is getoetst. Het ging bij de casestudy om een overheidsorganisatie in Nederland die in een vroeg stadium al ‘op het internet’ ging: de Belastingdienst.

Hieronder volgt een samenvatting van de dissertatie. Achtereenvolgens zullen aan bod komen het onderzoeksdoel, het theoretisch raamwerk, de gehanteerde methode, de resultaten en tot slot de conclusie en een aanbeveling.

***Het onderzoeksdoel***
Nu er een relevantie is vastgesteld voor het starten van een verkenning naar wat er gebeurt met starre organisaties die ‘op het internet gaan’, moet het onderzoeksdoel worden geconcretiseerd. Bij die concretisering spelen de volgende gedachten een rol. Met het internet is een soort van virtueel werkelijke wereld gecreëerd. Als een organisatie in verbinding staat met het internet is sprake van een vorm van interactie tussen die organisatie en die wereld. Interactie kan worden omschreven als een veelvoud aan invloeden die een georganiseerd systeem uitwisselt met zijn omgeving. Waarbij de wederzijdse invloeden bepaalde veranderingen teweeg kunnen brengen. Zowel in de structuur van het georganiseerde systeem als in de structuur van de omgeving. Deze gedachten vormen het startpunt van waaruit hieronder het onderzoeksdoel[60] verder wordt uitgewerkt.

Het begrip ‘organisatie’ kan op meerdere manieren worden gedefinieerd. Een enigszins abstracte maar binnen het kader van dit onderzoek bruikbare benadering is als volgt:  ‘organisatie’ duidt het *soort* relaties aan dat tussen de verschillende *soorten* componenten van een systeem moet bestaan om het te kunnen herkennen als een eenheid van een specifieke verzameling, bijvoorbeeld een auto of een overheid. Bij deze definitie[61] duidt het begrip 'structuur' de *daadwerkelijk* relaties tussen de *daadwerkelijke* componenten die *daadwerkelijk* een eenheid samenstellen aan en zodoende de eenheid concreet maken. Structuren kunnen worden aangepast zonder dat de organisatie verandert. Bijvoorbeeld door onderdelen te vervangen. Ook al wordt een dieselmotor door een benzinemotor vervangen, het blijft een auto.

De structuur van de organisatie beïnvloedt echter welke richting de

. . . . . .

60 Het verkennen van de mogelijke invloeden die een internet gerelateerd, virtueel front office kan hebben op de organisatiestructuur en de interne communicatiestructuur, zie ook het einde van deze paragraaf.

61 Maturana en Varela, 1998.

interacties opgaan. Een auto kan - in de regel - niet vliegen. Bovendien beperkt de organisatiestructuur de veranderingen van het systeem die de interacties teweeg kunnen brengen. Iemand kan nog zo hard de afgrond in rijden, aan de auto zullen geen vleugels groeien. Een systeem kan door deze beperking als het ware twee soorten veranderingen ondergaan. Het systeem past zich door structurele aanpassing aan zijn omgeving aan, of het systeem wordt vernietigd[62]. Als het systeem en de omgeving een wederzijds veranderingsproces via aanpassing in hun structuur zijn aangegaan, ontstaat er een zogenaamde *structuurkoppeling*.

Bij de interactie tussen mensen, die ook voor georganiseerde systemen kunnen doorgaan, speelt communicatie een belangrijke rol. Communicatie kan worden gedefinieerd als het via kanalen zenden, ontvangen en interpreteren van boodschappen tussen mensen. Boodschappen hebben een inhoudelijke en een relationele dimensie. Door te communiceren, kunnen mensen ‘structuurkoppelingen’, of beter gezegd, relaties, met elkaar aangaan en behouden. Als mensen meerdere relaties zijn aangegaan, vormen ze een georganiseerde groep. Bijvoorbeeld een schaakvereniging of een bedrijf. Die groep op zijn beurt communiceert weer met de omgeving. Mensen gebruiken vaak spraak of schrift om met elkaar te communiceren. Maar wat gebeurt er als ze het internet gaan gebruiken om zo via computers met elkaar in contact te komen? Het laatste betekent immers een nieuw kanaal en nieuwe relationele en inhoudelijke (denk aan de zogenaamde ‘emoticons’) dimensies van boodschappen. En bovendien een nieuwe ‘omgeving’, het internet. Welke invloed heeft dat op de structuren van georganiseerde groepen mensen?

Een relevante vraag. Veel organisaties zoals overheden en bedrijven hebben immers na de introductie van de World Wide Web technologie in 1991 het internet sterk omarmt. Ze ontwierpen hun eerste websites en lieten die ‘aan de Digitale Wereld zien’. Die websites waren vaak een-op-een vertalingen van hun folders naar html-pagina’s. Naarmate de tijd verstreek, werden de presentaties uitgebreider en technisch interactiever. Geleidelijk veranderden de websites in volwaardige virtuele bedrijfsloketten - de virtuele ‘front offices’. Deze virtuele front offices maakten het voor internetgebruikers mogelijk om organisaties via bijvoorbeeld e-mail te benaderen, of via chat-programma’s. Maar niet alleen dat, ook het bestellen of zelfs het leveren van producten werd mogelijk - denk bij het laatste bijvoorbeeld aan het downloaden van software. Binnen en via deze virtuele front offices worden ter ondersteuning van die producten vier verschillende soorten diensten aangeboden. Deze diensten staan allen op de een of andere manier in verbinding met het back office:

- informatiediensten
- communicatiediensten
- transactiediensten
- distributiediensten.

De virtuele front offices verbinden de organisaties met de Digitale Wereld. De Digitale Wereld is een virtuele wereld waarvan het internet de voornaamste technische basis vormt. Zowel wat betreft het netwerk als de toepassingen die op het internet ‘draaien’. De Digitale Wereld kan worden verdeeld in vier ontastbare ruimtes; de Virtuele Informatie Ruimte, de

. . . . . .

62 Door de ‘organisatiestructuur’ - aan een auto groeien geen vleugels - zweeft een auto niet over het ravijn maar slaat hij te pletter op de bodem.

Virtuele Communicatie Ruimte, de Virtuele Transactie Ruimte en de Virtuele Distributie Ruimte. Er kunnen drie domeinen worden onderscheiden die *bijdragen* leveren aan de Digitale Wereld, namelijk het technologische, het toepassings-, en het gebruikersdomein. Deze drie domeinen zijn aan permanente verandering onderhevig. Zodoende is ook de Digitale Wereld aan permanente verandering onderhevig:

- het technologische domein - met nieuwe technologieën zoals bijvoorbeeld de opkomst van het uitwisselen van data via steeds beter beveiligde netwerken;
- het toepassingsdomein, met nieuwe vormen van toepassingen van het internet bijvoorbeeld de opkomst van het 'daten';
- het gebruikersdomein, met veranderingen zoals bijvoorbeeld een toenemend aantal gebruikers.

Een virtueel front office voorziet een organisatie van een kanaal naar de voortdurend veranderende Digitale Wereld. In combinatie met het eerder beschreven verschijnsel van interactie en het verschijnsel 'structuuraanpassing' dringt zich vervolgens een aantal interessante vraagstukken op. Zou het zo kunnen zijn dat via dit kanaal wederzijdse invloeden worden uitgewisseld tussen organisatie en de Digitale Wereld? Kunnen die invloeden bepaalde veranderingen teweegbrengen in de structuur van een organisatie? Als dat zo is, wat voor soort veranderingen zijn dat dan? Zijn deze van aanpassende of van vernietigende aard? Rondom deze vraagstukken beweegt zich het eerste gedeelte van het onderzoeksdoel, namelijk: "Het verkennen van de mogelijke invloeden die een internet gerelateerd, virtueel front office kan hebben op de organisatiestructuur".

Communicatie speelt echter niet alleen een rol bij de interactie tussen organisatie en omgeving. De verschillende leden van een organisatie interacteren namelijk ook met elkaar. De organisatiestructuur wordt daarbij als het ware ondersteund door een zogenaamde interne communicatiestructuur. Dit impliceert dat veranderingen in de organisatiestructuur doorwerken in de interne communicatiestructuur. Overigens, dit werkt natuurlijk ook andersom. Veranderingen in de interne communicatiestructuur kunnen ook doorwerken in de organisatiestructuur. Het was daarom van belang om niet alleen te verkennen wat de mogelijke invloeden zijn die een internet gerelateerd, virtuele front office kan hebben op de organisatiestructuur. Het was ook van belang om te kijken naar wat de invloed van een internet gerelateerd, virtueel front office is op de interne communicatiestructuur. Het tweede gedeelte van het onderzoeksdoel is daarom als volgt gedefinieerd: "Het verkennen van de mogelijke invloeden die een internet gerelateerd, virtueel front office kan hebben op de interne communicatiestructuur."

Als de twee gedeelten bij elkaar worden gevoegd, levert dit het volgende onderzoeksdoel op: *"Het verkennen van de mogelijke invloeden die een internet gerelateerd, virtueel front office kan hebben op de organisatiestructuur en de interne communicatiestructuur."*

***Theoretisch raamwerk***

Nu het onderzoeksdoel is geconcretiseerd, is het aan de orde om het theoretisch raamwerk nader uit te werken. Op basis van dit theoretisch raamwerk zullen verderop - zie hiervoor de paragraaf *methode* - de onderzoeksvragen worden geformuleerd. De uitwerking begint bij dat deel van een organisatie dat verantwoordelijk is voor het aanpassen van de

organisatie aan veranderingen in de omgeving en eindigt met een grafische weergave van het theoretisch raamwerk.

De strategische top van een organisatie - d.w.z. de mensen die verantwoordelijk zijn voor het totale functioneren van de organisatie, dus het top-management en de medewerkers die het top-management ondersteunen - hoort te verzekeren dat de organisatie zo goed mogelijk haar missie kan (blijven) volbrengen. Het is aan de strategische top om daarbij veranderende omstandigheden in de organisatieomgeving te signaleren en de organisatie daaraan aan te passen. Dit houdt ondermeer in dat als een groot deel van de omgeving zich tot de Digitale Wereld wendt, de organisatie zich ook tot de Digitale Wereld wendt. Anders verliest het uiteindelijk de toegang tot haar omgeving en daarmee de mogelijkheid om iets aan die omgeving aan te bieden dan wel iets van die omgeving af te nemen[63].

Door een virtueel front office in te richten, legt een organisatie een kanaal naar de Digitale Wereld aan. Er is echter pas sprake van een structuurkoppeling als dit kanaal herhaaldelijke interacties tussen organisatie en omgeving doorgeeft, in dit geval tussen organisatie en de Digitale Wereld, die tot wederzijdse structuuraanpassing leiden. Zodra eenmaal sprake is van een structuurkoppeling, zal het virtuele front office zich moeten blijven aanpassen aan de veranderende omstandigheden in (een of meer van de vier virtuele ruimtes van) de Digitale Wereld. Als dit aanpassingproces wordt stopgezet omdat het virtuele front office zijn aanpassingsvermogen is kwijtgeraakt, dan zal de structuurkoppeling uiteindelijk verloren gaan. Als dat gebeurt, is de organisatie niet langer in staat om de bijdragen te adopteren van de drie domeinen (dus vanuit het technologische, het toepassings-, en het gebruikersdomein) aan de Digitale Wereld. Met andere woorden, naarmate het aanpassingsvermogen van een virtueel front office kleiner wordt, verliest een organisatie meer en meer de mogelijkheid om de kansen waar te nemen die de Digitale Wereld biedt. De organisatie is dan als het ware de toegang tot haar omgeving kwijtgeraakt.

Het aanpassingsvermogen van een virtuele front office kan worden vastgesteld door met name naar het volgende te kijken:

A heeft het virtuele front office wel of geen moeite met het adopteren van:
   - *nieuwe* bijdragen vanuit het technologische, het toepassings-, en/of het gebruikersdomein aan die Virtuele Ruimte(s) waarmee de organisatie *reeds* een structuurkoppeling onderhoudt?
   - *geleverde* bijdragen vanuit het technologische, het toepassings-, en/of het gebruikersdomein aan die Virtuele Ruimte(s) waarmee de organisatie *nog geen* structuurkoppeling onderhoudt?

B is de organisatie wel of niet in toenemende mate bezig met het via het virtuele front office kanaliseren (d.w.z. naar eigen hand zetten) van interacties met de Digitale Wereld?

. . . . . .

63 Bijvoorbeeld, als een gedeelte van de belastingbetalers (bijvoorbeeld zowel de ‘innovators’ als de ‘early adopters’, die samen 16 procent van een populatie vormen - Rogers, 1983) voor een belangrijk deel gebruik maakt van de Virtuele Informatie Ruimte om informatie tot zich te nemen, dan kan een Belastingdienst deze groep het beste bereiken door (ook) via deze ruimte informatie aan die groep belastingbetalers aan te bieden. Bijvoorbeeld als het gaat om grote veranderingen in het belastingstelsel.

Hoe meer moeite het virtuele front office heeft met het adopteren van bijdragen, en hoe harder de organisatie probeert om via het virtuele front office de interactie met de Digitale Wereld te kanaliseren, des te lager ligt aanpassingsvermogen van het virtuele front office.

Zoals aan het begin is gesteld, beïnvloedt de structuur van een georganiseerd systeem welke richting de interacties met de omgeving opgaan. De structuur bepaalt als het ware de flexibiliteit waarmee (delen van) de organisatie op bepaalde invloeden vanuit de omgeving kunnen reageren. Zo bekeken, beïnvloedt de organisatiestructuur[64] het aanpassingsvermogen van het organisatiedeel dat interacteert met de Digitale Wereld, namelijk het virtuele front office.

De organisatiestructuur wordt ondersteund door de interne communicatiestructuur. De interne communicatiestructuur omvat het netwerk van boodschappen dat parallel loopt aan het formele relatienetwerk van een organisatie. Op zich ondersteunt de interne communicatiestructuur alleen de organisatiestructuur en niet het virtuele front office. Dit impliceert dat de interne communicatiestructuur op zich geen directe invloed heeft op het aanpassingsvermogen van het virtuele front office.

Om uit de vinden in welke mate de organisatiestructuur het aanpassingsvermogen beïnvloedt, moet worden gekeken naar het type organisatie waarmee we te maken hebben. Het is mogelijk om onderscheid te maken tussen twee tegenovergestelde extremen op een glijdende schaal, type A versus type B[65]. Hoe meer een organisatie in de richting van het Type A zit, hoe groter de mogelijkheden om routines in de werkprocessen aan te brengen. Maar des te lager zal het probleemoplossend vermogen zijn. Voor een organisatie dat meer in de richting van het Type B zit, geldt het tegenovergestelde. Type B kent weinig mogelijkheden om routines in haar werkprocessen aan te brengen, daarentegen is het probleemoplossend vermogen hoog. Type A is gericht op een zo hoog mogelijke *eerste orde productiviteit*. Eerste orde productiviteit mikt op constante processen. Type B is gericht op *tweede orde productiviteit*. Tweede orde productiviteit mikt op processen die voortdurend of muterend veranderen. Type A richt zich op een hoge mate van zekerheid. En type B richt zich op een hoge mate van onafhankelijkheid. De mate van zekerheid heeft betrekking op het afschermen van de leden van een organisatie van onzekerheid en van onverwachte reacties in de omgeving. De mate van onafhankelijkheid geeft aan in hoeverre de individuele leden van een organisatie zelfstandig hun taakuitvoering bepalen zonder dat ze daar op worden overgewaardeerd en vervolgens te zwaar op worden afgerekend.

Organisaties hanteren variabelen die in samenhang de organisatiestructuur vormen. Organisaties die (veel) naar het type B tenderende variabelen hanteren, tonen een hogere mate van flexibiliteit dan organisaties die (veel) naar het type A tenderende variabelen hanteren. Type B organisaties zijn er immers voor gemaakt om te anticiperen op permanente of muterende verandering. Organisaties van het type A zijn daar niet voor gemaakt. Zij richten zich op constante processen. Dit impliceert dat type A organisaties

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64 Organisatiestructuur wordt binnen dit onderzoek gedefinieerd als het totaal aan instrumenten waarmee het werk wordt verdeeld in verschillende taken en waarmee de uitvoering van die taken wordt gecoördineerd.

65 Hill, Fehlbaum en Ulrich, 1994.

een rigide organisatiestructuur hebben. De volgende tabel toont aan wanneer er sprake is van een type A of een type B variabele.

| Type A Variabele niveau | Instrument | Type B Variabele niveau |
|---|---|---|
| Laag | Decentralisatie | Hoog |
| Laag | Functionalisering | Hoog |
| Laag | Delegatie | Hoog |
| Laag | Participatie | Hoog |
| Hoog | Standaardisatie | Laag |
| Hoog | Separatie | Laag |

Het bovenstaande geeft reeds impliciet aan hoe de organisatiestructuur het aanpassingsvermogen van het virtuele front office kan beïnvloeden. Namelijk hoe meer de structuurkoppeling(en) die door het virtuele front office is gerealiseerd, wordt ondersteund door type A variabelen - m.a.w. rigide variabelen - des te lager het aanpassingsvermogen van het virtuele front office zal zijn.

De mate waarin een organisatie naar type A tenderende variabelen toepast, beïnvloedt echter niet alleen het aanpassingsvermogen van het virtuele front office. Het bepaalt ook in hoeverre een organisatie bereid is om een kanaal in te richten naar die specifieke Virtuele Ruimte(s) waarvan de kernactiviteiten het sterkst overeenkomen met de eigen kernactiviteiten. In dit kader moet het begrip *productiviteit van een organisatie* nader worden toegelicht.

De productiviteit van een organisatie kan worden omschreven als de relatie tussen;

A enerzijds de prestaties die een organisatie levert aan haar omgeving *en*
B anderzijds het leveren van deze prestaties door:
   I zowel het betrekken van middelen uit de omgeving
   II als het presteren van de verschillende onderdelen van de organisatie.

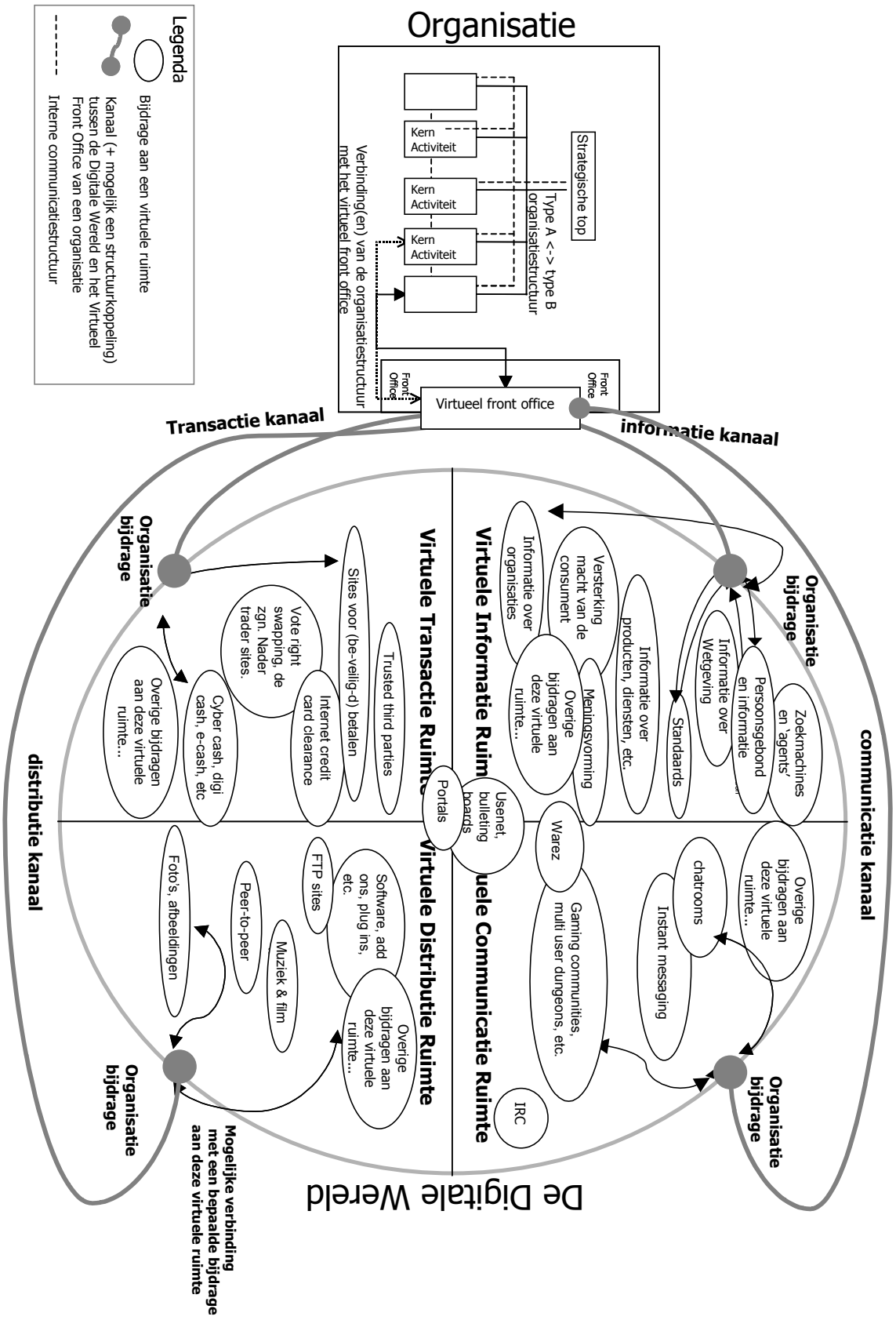
Met andere woorden, als de omgeving verandert, dan veranderen de voorwaarden om aan de omgeving te leveren. Bovendien veranderen dan ook de voorwaarden om middelen vanuit de omgeving te betrekken. Als die voorwaarden veranderen, dan moeten de voorwaarden waaronder de verschillende onderdelen van de organisatie presteren ook veranderen. Anders vermindert zijn productiviteit.

Als het merendeel van de organisatie in verbinding staat met een omgeving die voortdurend verandert, dan is dat merendeel van de organisatie gedwongen om zich voortdurend aan die veranderende omgeving aan te passen. Een organisatie kan zich immers niet veroorloven dat het deze omvangrijke verbinding met haar omgeving kwijtraakt. Want als dat wel gebeurt, kan de organisatie niet langer aan de omgeving leveren en kan zij niet langer middelen uit de omgeving betrekken. In dat geval verliest zij haar productiviteit. Een organisatie zonder productiviteit heeft geen bestaansrecht.

Kernactiviteiten beslaan het merendeel van de organisatie. Type A variabelen zijn niet gemaakt voor het anticiperen op de permanente en muterende veranderingen in de organisatieomgeving, in dit geval in de Digitale Wereld. Voortredenerend betekent dit dat organisaties die (veel) type A variabelen hanteren hoogstwaarschijnlijk grote aarzelingen zullen hebben bij het aangaan van een volwaardige structuurkoppeling - een

structuurkoppeling vereist immers voortdurende (wederzijdse) aanpassing - met dat gedeelte van de Digitale Wereld waarvan de kernactiviteiten het sterkst overeenkomen met de eigen kernactiviteiten.

Hieronder volgt een grafisch overzicht van het theoretisch raamwerk.



***Methode***

Empirisch onderzoek in een bepaalde organisatie[66] moet antwoord geven op de volgende onderzoeksvragen, welke zijn geformuleerd op basis van het hierboven omschreven theoretisch raamwerk:

1 *Neemt de strategische top van de organisatie de beslissing om een kanaal aan te leggen naar de Digitale Wereld omdat deze er voor wil zorgen dat de organisatie haar missie zo goed mogelijk kan uitvoeren? Als dat het geval is, neemt de strategische top die beslissing zodra het signaleert dat haar reguliere organisatieomgeving zich tot de Digitale Wereld wendt?*

2 *Is de organisatie in staat om een structuurkoppeling te creëren met de Digitale Wereld door het implementeren van een virtueel front office?*

3 *Is de organisatie er op gericht om haar virtuele front office aan te passen aan veranderingen in de Digitale Wereld met de bedoeling om de structuurkoppeling met de Digitale Wereld te behouden? Als dat het geval is, gaat de organisatie dan over tot het aanpassen van haar virtuele front office zodra deze signaleert dat er veranderingen optreden in een of meer van de vier virtuele ruimtes waar het een structuurkoppeling mee heeft?*

4 *Verbindt de organisatie de structuurkoppeling - zoals die wordt ondersteund door haar virtuele front office - met haar organisatiestructuur door meer en meer naar Type A tenderende variabelen toe te passen? Als dat het geval is, neemt het aanpassingsvermogen van het virtuele front office dan af?*

5 *Verbindt de organisatie de structuurkoppeling - zoals die wordt ondersteund door haar virtuele front office - met haar organisatiestructuur door meer en meer naar Type A tenderende variabelen toe te passen? Als dat het geval is, heeft de organisatie dan aarzelingen bij het aangaan van een structuurkoppeling met die Virtuele Ruimte(s) van de Digitale Wereld waarvan de kernactiviteiten het sterkst overeenkomen met de eigen kernactiviteiten?*

6 *Veranderen de organisatiestructuur en de interne communicatiestructuur als er in het virtuele front office communicatiediensten worden aangeboden?*

7 *Verbindt de organisatie de structuurkoppeling - zoals die wordt ondersteund door haar virtuele front office - met haar organisatiestructuur door meer en meer naar Type A tenderende variabelen toe te passen? Als dat het geval is, ondersteunt het virtuele front office een structuurkoppeling met de Virtuele Communicatie Ruimte? Als dat het geval is, is het virtuele front office er dan in toenemende mate op gericht om de communicatiestromen tussen de organisatie en de Virtuele Communicatie Ruimte te kanaliseren?*

Het empirische onderzoek kan worden gekarakteriseerd als:

A exploratief in de eerste fase van het onderzoek, in 1997, omdat het toen nog een relatief nieuwe zoektocht was, organisaties kregen met een

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66 In deze casestudy de Nederlandse Belastingdienst

nieuw fenomeen te maken. Het internet begon immers pas na het midden van de jaren negentig aan zijn opmars[67].

B hypothese ontwikkelend in de tweede fase van het onderzoek. Na een eerste analyse bleek dat het virtueel front office slechts een zeer beperkte invloed had op de organisatiestructuur en de onderliggende communicatiestructuur. De oorspronkelijke verwachting, dat 'Internet communicatie' op zich - als een soort van onafhankelijke variabele - automatisch zou leiden to revolutionaire veraderingen in de communicatie processen van een organisatie en daarmee in de organisatiestructuur, werd niet waargemaakt. Deze conclusie vormde de aanleiding om een dimensie aan het onderzoek toe te voegen. Namelijk het vinden van een potentieel oorzakelijk verband. Met andere woorden, nadat de dataverzameling liet zien dat er nauwelijks sprake was van invloed van het virtueel front office op de organisatie- en communicatiestructuur richte het tweede deel van het onderzoek zich op het bestuderen van de verzamelde data met de bedoeling om een potentieel oorzakelijk verband te vinden tussen een rigide organisatiestructuur (type A) en een afgenomen aanpassingsvermogen van een virtueel front office met de bedoeling om uiteindelijk nieuwe hypothesen te ontwikkelen voor toekomstig onderzoek.

C Kwalitatief, het onderzoek betrof een case study van een organisatie met relatief weinig organisatie eenheden.

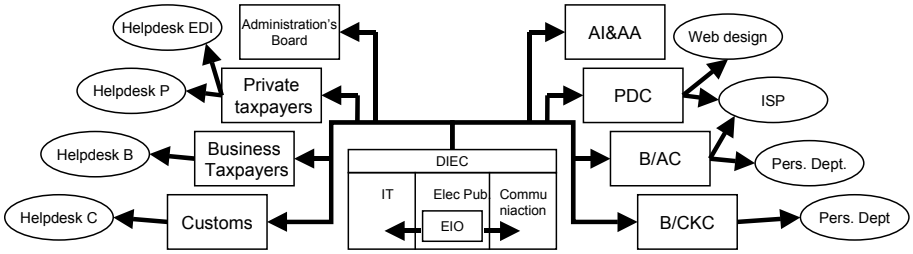
De onderzoekslocatie van waaruit de case study werd uitgevoerd was de zogenaamde internetredactie van de Belastingdienst tussen 1997 en aanvang 2000. De internetredactie was verantwoordelijk voor het beheren van www.belastingdienst.nl en het afhandelen van e-mailberichten.

Ondanks dat het onderzoek een case study betrof, was gezien de omvang van de Belastingdienst het trekken van een steekproef nodig. Dit gebeurde als volgt:

- *Sneeuwbalsteekproef*: er moest worden gekeken naar de invloed van het virtuele front office op de organisatiestructuur - en de bijbehorende interne communicatiestructuur - waaraan de structuurkoppeling werd verbonden. Daardoor hoefden alleen die organisatieonderdelen in beeld worden gebracht die formeel, dan wel zowel formeel als direct te maken hebben met de implementatietaken dan wel met de beheertaken aangaande www.belastingdienst.nl en …@belastingdienst.nl ('direct' wil zeggen de afdelingen die daadwerkelijk implementatie- of beheertaken uitvoeren). Het was niet aan de orde om organisatieonderdelen in beeld te krijgen die geen formele relatie hebben met de hierboven omschreven taken. Om dat te bereiken, was een selectieve, non-random methode nodig. De sneeuwbalsteekproef voldoet aan deze eisen. De volgende afbeelding laat de afgelegde route van 'de sneeuwbal' zien, waardoor zichtbaar wordt welke afdelingen formeel (10) dan wel zowel formeel als direct (10) betrokken waren bij www.belastingdienst.nl en …@belastingdienst.nl.

. . . . . .

67 In de Verenigde Staten brak voor het internetgebruik in 1995 de 'early adopters' fase aan. In april 1997 begon daar de 'early majority' fase. Halverwege 2000 begon de 'late majority' fase. In Nederland duurde het tot 1999 voordat de 'early adopters' fase kon worden afgeloten. Kijken we naar de cijfers wereldwijd, dan was 1998 nog de 'innovator' fase en is er in 2002 nog steeds sprake van de 'early majority' fase.




EDI - electronic data interchange
P - particulieren
B - ondernemers
C - douane
AI&AA - Artificial Intelligence & Administrative Automation
PDC - Parlementair Documentatie Centrum
B/AC - Het Automatiseringscentrum van de Belastingdienst, heet tegenwoordig B/CICT.
B/CKC - Uitgeverij, opleidingsinstituut en organisatieadviescentrum van de Belastingdienst
DIEC - De Belastingdienst projectorganisatie Documentaire Informatievoorziening en Elektronische Communicatie
EIO - internetredactie
Pers. Dept. de afdelingen die onder andere de vacaturestromen beheren.

| **Formeel** | **Zowel formeel als direct** |
|---|---|
| Raad van bestuur (Administration's Board) | |
| | AI en AA |
| Divisie Particulieren (Private Taxpayers Division) | Helpdesk P |
| | Helpdesk EDI |
| Divisie Ondernemingen (Business Taxpayers Division) | Helpdesk B |
| Divisie Douane (Customs Division) | Helpdesk C |
| PDC | Internet Service Provider (ISP) |
| | Web Design |
| IT – DIEC | |
| Electronic Publishing – DIEC | EIO |
| Aspect Communicatie DIEC (Communications - DIEC) | |
| B/AC | Pers. Dept B/AC |
| B/CKC | Pers. Dept B/CKC |

- *Steekproef van perioden*: door de sneeuwbalsteekproef werd duidelijk welke afdelingen naast de internetredactie eveneens betrokken waren bij www.belastingdienst.nl en …@belastingdienst.nl. Vervolgens moest worden gekeken naar welke veranderingen er - gerelateerd aan het virtueel front office - in verloop van tijd optraden bij die afdelingen die zowel formeel als direct betrokken waren bij www.belastingdienst.nl en …@belastingdienst.nl. Het was echter niet mogelijk om overal te tegelijkertijd te zijn en om bovendien 24 uur per dag te monitoren. Dat was alleen mogelijk bij de internetredactie middels participerende observatie. Om veranderingen bij die andere afdelingen in beeld te krijgen, was een nieuwe, selectieve steekproef nodig, namelijk een *steekproef van perioden*. Waarbij de perioden bestonden uit drie aangesloten maanden - dus met een driemaandelijkse interval. Deze selectieve steekproef werd gedurende twee jaar (1998 en 1999) uitgevoerd.

Voor de dataverzameling werden de volgende methoden gehanteerd:
- Participerende observatie: de participerende observatiemethode werd gehanteerd tussen het begin van 1997 tot halverwege 1998. De observatierol kan worden gekarakteriseerd als 'observerend participant'.

De onderzoekslocatie stond het toe dat vijf dagen per week anderhalf jaar lang een viertal rollen kon worden gespeeld. De observerende participant speelde de rol van een van de:
  - projectleiders binnen de internetredactie
  - technische adviseurs
  - internetredacteuren die de activiteiten en technologieën met betrekking tot web site en e-mail schriftelijk moest vastleggen.
  - internetredacteuren die belast was met de e-mailafhandeling.
- Open interviews: gedurende de case study zijn er twee soorten van interviews afgenomen. Namelijk vrije-attitude interviews en half-gestructureerde interviews. De interviews werden afgenomen tussen 1997 en halverwege 1999. Bij alle internetredacteuren en verschillende medewerkers en leidinggevenden van de afdelingen die deel uitmaakten van de selectieve steekproef van perioden werden 'free-attitude' interviews afgenomen. De half- gestructureerde interviews werden gehouden met vier sleutelfiguren in de top-down relatie vanaf de strategische top naar de internetredactie.
  - de Directeur-Generaal der Rijksbelastingdienst;
  - het hoofd communicatie van de Belastingdienst;
  - de account manager bij het Parlementair Documentatie Centrum;
  - de Algemeen Project Manager van de projectorganisatie DIEC.
- Document Verzameling: vanaf 1997 tot 2000 zijn er documenten verzameld die zijn onder te brengen in de volgende categorieën:
  - witboeken; beleidsdocumenten;
  - groenboeken; discussiedocumenten;
  - rapporten; evaluaties;
  - het elektronisch archief van www.belastingdienst.nl.

***Resultaten***

Aan de hand van de dataverzameling werd het theoretisch raamwerk (zie hierboven) getoetst. In het kort komt het er op neer dat voor wat betreft de Belastingdienst geen van de onderzoeksvragen ontkennend kan worden beantwoord. Dit betekent dat:

- De strategische top van de Belastingdienst besloot om een kanaal naar de Digitale Wereld aan te leggen zodat de organisatie aan haar missie kon (blijven) werken. De strategische top kwam tot dit besluit zodra het signaleerde dat haar reguliere organisatieomgeving zich tot de Digitale Wereld begon te wenden, namelijk in 1995. In hetzelfde jaar implementeerde de Belastingdienst de eerste versie van zijn virtuele front office.

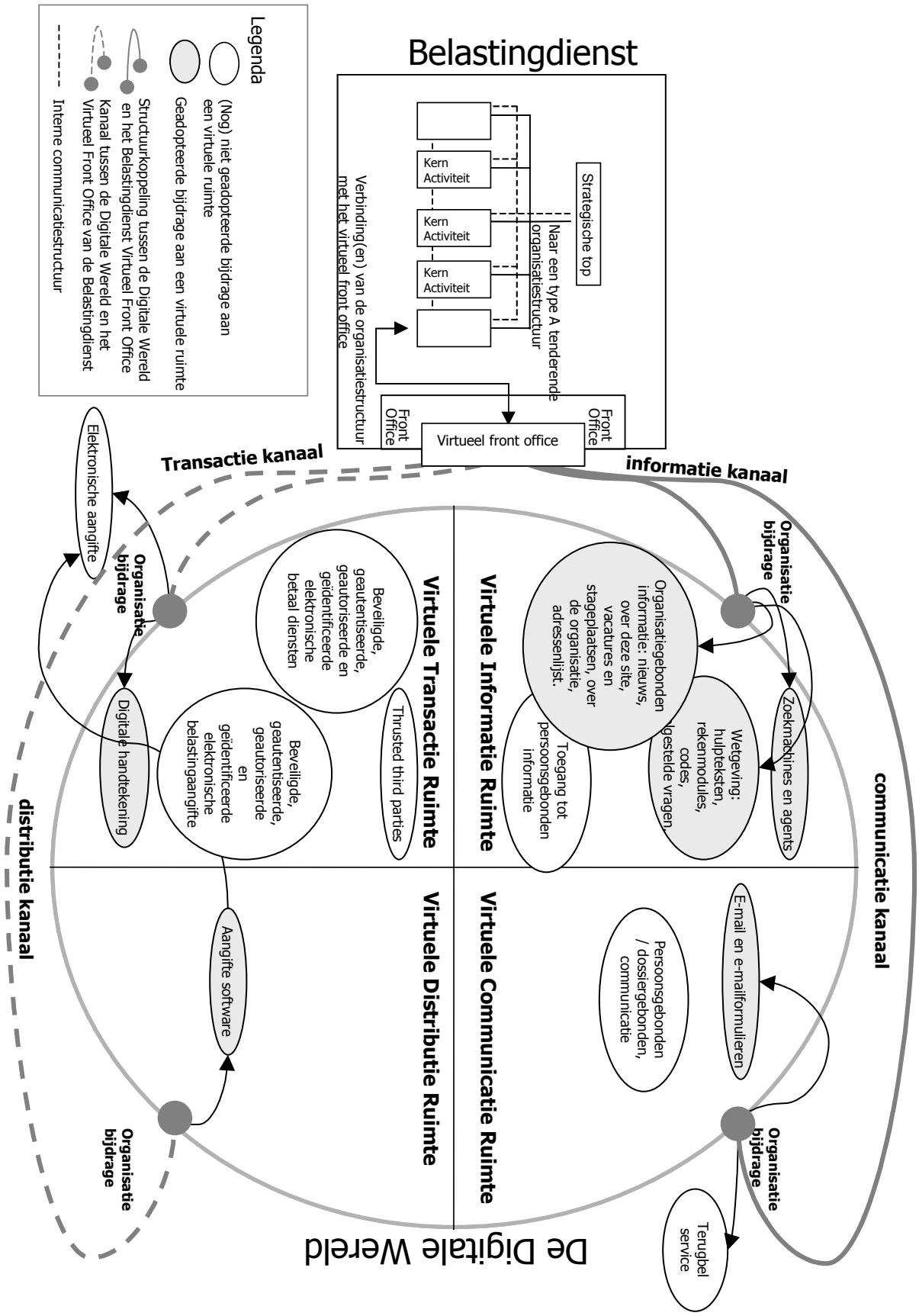
- Toen de Belastingdienst enerzijds en de Virtuele Informatie Ruimte en de Virtuele Communicatie Ruimte anderzijds zich aan elkaar begonnen aan te passen, ontstond er een structuurkoppeling. De Belastingdienst deed haar best om het virtuele front office aan te passen zodra er veranderingen optraden in deze virtuele ruimtes.

- De Belastingdienst verbond de structuurkoppelingen - zoals die werden ondersteund door zijn virtuele front office - met zijn organisatiestructuur door meer en meer naar Type A tenderende variabelen toe te passen. Tegelijkertijd nam het aanpassingsvermogen van het virtuele front office van de Belastingdienst af. Daar komt bij dat er van duidelijke aarzeling sprake was om een structuurkoppeling aan te gaan met die virtuele

ruimte waarvan de kernactiviteiten het sterkst overeenkomen met de eigen kernactiviteiten, namelijk de Virtuele Transactie Ruimte.

- Er werden aanpassingen in de organisatiestructuur (door uitbreiding van het takenpakket van afdelingen) en de interne communicatiestructuur (door het initiëren van afstemmingsoverleggen tussen afdelingen) doorgevoerd vanaf het moment dat er communicatiediensten werden aangeboden. Daar komt bij dat op het moment dat via het virtuele front office van de Belastingdienst een structuurkoppeling met de Virtuele Communicatie Ruimte was gecreëerd, het virtuele front office er in toenemende mate op gericht was om de communicatiestromen tussen de organisatie en de Virtuele Communicatie Ruimte te kanaliseren.

Hieronder volgt wordt een grafisch overzicht van de resultaten weergegeven.




Facing the Digital World - *Connecting a permanently changing Internet to rigid organisational structures*

Conclusie
Nu het theoretisch raamwerk aan de resultaten is getoetst, is het zaak om in deze paragraaf via de conclusie terug te keren naar het doel van dit onderzoek: Het verkennen van de mogelijke invloeden die een internet gerelateerd, virtueel front office kan hebben op de organisatiestructuur en de interne communicatiestructuur.

Dit verkennend onderzoek liet zien dat een belangrijke drijvende kracht achter structuurveranderingen in organisaties die ‘op het internet gaan’ moet worden gezocht in het fenomeen van interactie tussen een organisatie en zijn omgeving. En niet zozeer in het adopteren van internet communicatie media middels het implementeren van een virtueel front office. Het is de organisatiestructuur die bepaalt in hoeverre een organisatie tijdens het interacteren met de Digitale Wereld in staat is om zich aan te passen aan veranderingen in die Digitale Wereld.

Dit onderzoek liet ook zien dat tijdens de interactie tussen een rigide organisatie en de Digitale Wereld niet alleen de organisatie maar ook de Digitale Wereld wordt beïnvloed. Namelijk door een virtueel front office dat zich in toenemende mate richt op het kanaliseren van de interacties met de Digitale Wereld. Het is de mate waarin een virtueel front office is gekoppeld aan de bestaande organisatiestructuur die bepaalt in hoeverre de wederzijdse invloeden leiden tot daadwerkelijke structuurveranderingen, zowel in de organisatie als in de Digitale Wereld.

De theorie die in dit onderzoek is ontwikkeld en getest, suggereert onder meer dat een virtueel front office in de pas moet blijven lopen met de ontwikkelingen in een of meer van de virtuele ruimtes waar het een structuurkoppeling mee heeft. Want als een virtueel front office daartoe niet meer goed in staat is, is het aanpassingsvermogen verminderd. De kans bestaat dan dat uiteindelijk de structuurkoppeling met de Digitale Wereld verloren gaat. Als dat het geval is, adopteert de organisatie niet langer de bijdragen die vanuit de drie domeinen - technologisch, toepassings- en gebruikersdomein - aan de Digitale Wereld worden geleverd. Met andere woorden, de organisatie heeft niet langer toegang tot de kansen die de Digitale Wereld biedt.

Dus als een organisatie een structuurkoppeling wil met een of meer van de virtuele ruimtes van de Digitale Wereld, dan zal de organisatie naar type B tenderende variabelen moeten toepassen in plaats van naar type A.

Om er achter te komen of de variabelen een voldoende hoog type B gehalte kennen, moet de organisatie een simpele vraag beantwoorden: kan ons virtueel front office in de pas blijven lopen met relevante, plotselinge en/of extreme veranderingen die zich voordoen in die virtuele ruimte(s) waarmee het in verbinding staat of wil staan? Als het antwoord op die vraag nee is - en de organisatie het wenselijk vindt dat het virtuele front office wel in de pas blijft lopen - dan suggereert de ontwikkelde theorie dat het type B gehalte moet worden opgevoerd.

***Aanbeveling***
De samenvatting van deze dissertatie wordt afgesloten met een van de aanbevelingen die op basis van dit verkennend onderzoek kan worden gedaan. Namelijk hoe de Belastingdienst er voor kan zorgen dat het aanpassingsvermogen van zijn virtueel front office weer toeneemt.

Om te voorkomen dat het aanpassingsvermogen nog verder vermindert dan nu het geval is, moet ook bij de Belastingdienst het type B gehalte met betrekking tot het virtuele front office worden opgevoerd. Maar het is met nadruk niet wenselijk dat de Belastingdienst als geheel in een (extreem) type B organisatie verandert. Het argument hiervoor is dat de Belastingdienst een zogenaamde rechtshandhaver is. Hij streeft daarbij naar rechtsgelijkheid en rechtszekerheid. Voor dit streven zijn constante processen nodig waarbij onzekerheden voor burger en bedrijf tot een minimum worden gereduceerd. Daarom is het voor de Belastingdienst zaak om een organisatie te zijn die naar het type A tendeert. Hierop voortredenerend zou dit principe niet alleen voor de Belastingdienst moeten gelden, maar voor alle rechtshandhavers. Met andere woorden, organisaties die rechtszekerheid en rechtsgelijkheid aan hun omgeving leveren, en dus aan onzekerheidsreductie doen en gefixeerd zijn op zekere en dus constante processen, moeten afzien van de ambitie om in een (extreem) type B organisatie te veranderen.

Het bovenstaande lijkt paradoxaal. Toch is het mogelijk om het type B gehalte per gehanteerde variabele inzake het virtuele front office te verhogen, zonder daarbij de type A organisatie te verstoren. Namelijk door de variabelen als volgt te hanteren:

- Hoge mate van *decentralisatie* inzake het virtuele front office*;* op dit moment is het beheer van de verschillende virtueel front office diensten opgesplitst (m.a.w. er is sterk gecentraliseerd) en bij verschillende onderdelen van de bestaande - naar een type A tenderende - organisatie gelegd. Om een hoge mate van decentralisatie te bewerkstelligen, zal echter het beheer bij een nog in te richten organisatieonderdeel moeten worden gelegd dat hier specifiek voor in het leven moet worden geroepen.
- Lage mate van *separatie* inzake het virtueel front office; dit kan voor een belangrijk deel worden bereikt door van de taken die bij het virtueel front office horen niet alleen de beheertaken van de virtueel front office diensten bij het nog in te richten organisatieonderdeel te leggen, maar ook de ontwikkel- en implementatietaken.
- Hoge mate van *functionalisatie* inzake het virtuele front office; de teams die deel uit gaan maken van dit nog in te richten organisatieonderdeel moeten worden ingebed in een organisatievorm waarbij zo min mogelijk sprake is van een sterke uniforme top-down bevelstructuur. Dat kan door bijvoorbeeld voor een matrix organisatievorm te kiezen. De matrix organisatie zou kunnen worden ingericht met enerzijds de aspectsectoren ontwikkeling, implementatie en beheer en met anderzijds de lijnsectoren informatie-, communicatie-, transactie- en distributiediensten .
- Hoge mate van *delegatie* en *participatie* inzake het virtuele front office; het nog in te richten organisatieonderdeel moet zo ‘plat’ mogelijk zijn. Dus met een korte hiërarchische lijn tussen de leiding van de organisatie en de medewerkers. Bovendien moeten de medewerkers binnen de organisatie in grote mate zelf kunnen bepalen hoe zij hun werk uitvoeren.
- Lage mate van *standaardisatie* inzake het virtuele front office; de ontwikkelingen in de Digitale Wereld zijn niet goed voorspelbaar en niet zelden complex. Het adopteren van dit type ontwikkelingen vereist een zekere mate van improvisatie en het flexibel toepassen van de regels. Een lage standaardisatie van met name de ontwikkelings- en implementatieprocessen maar wellicht ook van de beheerprocessen moet voorkomen dat voor improvisatie en flexibiliteit geen ruimte is.