UNIVERSITY OF TWENTE

Post Completion Auditing at Heineken Nederland Supply

Master Financial Management

Ir. H. Kroon
Drs. G.C. Vergeer
J.W. Winkels RC
J.L. Sträter MSc

Jasper Veurink BSc
s0181005

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Management Summary

In this thesis the following research question will be answered:

What are the requirements for the PCA process at HNS in order to enhance Organizational Learning and how should the PCA process be designed at HNS in order to fulfill these requirements?

In order to answer this question, firstly a literature study is performed concerning Post Completion Auditing (PCA) and Organizational Learning (OL). In the literature is found how certain elements within a PCA process can enhance OL. Examples of these elements are target setting during the pre-phase of an investment, the conductor of PCA, the presentation forum of the final results of PCA and how to register PCA reports within a database.

Secondly a case study and survey is executed at Heineken Nederland Supply. The case study is conducted by the researcher through performing 7 PCA's of investments at HNS. Goal of the case study is to obtain more knowledge about PCA and to gain insight on how PCA is executed within the organization of HNS. The case study reveals current practices and problems at HNS concerning PCA which are described in this thesis. Findings from both literature and the case study are used for the surveys with controllers and project managers at HNS to identify the design requirements of the new PCA process. This is the basis for the design of the new PCA process.

This set of requirements consists of the (1) objectives of PCA of HNS, (2) how to register PCA criteria during the pre-phase of an investment and (3) the elements which have to be included in the PCA process in order to enhance OL.

The main objective for HNS is to learn from successes and failures of investment projects in the past. Further, decision control regarding the quality of business cases is a goal for HNS to conduct PCA's within their organization. In order to be able to conduct PCA's, target setting during the pre-phase of an investment is important. Based on these targets the PCA reports are written and are therefore the basis for PCA. In this thesis will be discussed how to set these targets SMART in order to be useful for the assessment of the performance of a project in a PCA.

Finally, the four sub processes of OL information acquisition, information distribution, information interpretation and organizational memory are used to identify elements within a PCA process that can enhance OL. They are described in literature and in this thesis is tried to translate them to the situation at HNS in order to find the design requirements for the PCA process. After the set of requirements is finished, the PCA process is designed for HNS together with the implementation of the PCA process.

At last, an evaluation concerning this designed process is given by me as a designer and the stakeholders of the process together with the conclusions and recommendations.

Preface

To conclude my master Financial Management at the University of Twente a research has to be conducted. This is also the motive to conduct this study together with the request of Heineken Nederland Supply (HNS) to develop a Post Completion Auditing (PCA) process. After this master thesis is approved, I will conclude my master Financial Management.

This master thesis is a result of many months of hard work. I started my internship at Heineken Nederland Supply in September 2012. The internship at HNS consisted of conducting PCA's and writing this thesis. It was a great experience to do PCA on several investment of a big multinational. Every project was different and therefore every PCA had different learning experiences. In order to conduct the PCA's and to do this study I had to meet with many employees of different departments and of different levels within the organization. I had the possibility to do this because the PCA's were executed at different breweries (Den Bosch and Zoeterwoude) and at different departments like brewing, production, logistic and control.

I wish to thank my supervisors from the University of Twente, Ir. H. Kroon and Drs. G.C. Vergeer and my managers from HNS J.W. Winkels R.C. and J.L. Sträter MSc. The supervisors helped me a lot with the academic background and structure of this thesis and without the practical background from HNS it would be much more difficult to acquire the results I now have. I hope you will read this report in order to obtain useful insights regarding the development of a PCA process at HNS.

Kind Regards,

Jasper Veurink

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List of abbreviations

PCA	Post Completion Audit
OL	Organizational Learning
HNS	Heineken Nederland Supply
FA	Fund Application
OPI	Operational Performance Indicator
OAP	Overgang Acceptatie Protocol
VOAP	Voorlopig Overgang Acceptatie Protocol
BC	Business Case

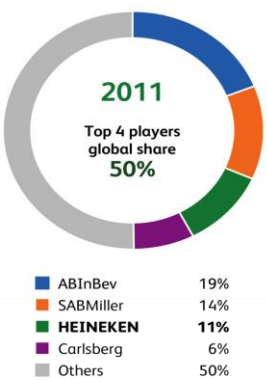
1. Introduction to: Heineken Nederland Supply, the research problem, the research questions and the structure of the thesis.

To conclude my master Financial Management at the University of Twente I currently work at Heineken Nederland Supply (HNS). Responsibility for me at HNS is to conduct Post Completion Audit's (PCA) of executed investments. Concerning this topic, I also perform a research on how HNS should design its PCA process in such a way that it enhances Organizational Learning (OL). The design of this PCA process is the topic for my thesis.

In this introduction chapter, the organization Heineken and Heineken Nederland Supply is briefly described firstly. Subsequently, the topic PCA is explained shortly together with the research problem and the research questions.

1.1 Background of Heineken and Heineken Nederland Supply

Heineken is one of the leading companies of the beer sector in the world. The product is available in 172 countries all over the world which makes it likely that many people are familiar with the brand. In order to brew the beers, or in Heineken language 'to serve the planet', Heineken has 165 breweries in 71 countries. The company generated € 17.123 million revenue in the year 2011. Their profit was € 1.584 million in the same year as well together with 164.6 million hectoliter produced beer. Figure 1 shows the market share



of Heineken in the world. As given, Heineken is the third global player in the brewing industry.

Heineken has three different breweries in the Netherlands. One in Zoeterwoude, which is the biggest brewery in Europe, one in Den Bosch and a small brewery in Wijlre. Besides these breweries, Heineken Nederland has a soft drink company Vrumona which produces different brands like Pepsi, Gatorade and Sourcy.

Figure 1, Global market share brewing industry

HNS is the department of Heineken Nederland that is responsible for the production of beer for both the domestic and the export market. Hence, this department is responsible for the breweries. HNS sells their beers to customers, mainly to operating companies of Heineken, who resell the product to their clients. Heineken USA and Heineken Netherlands are the two largest HNS customers.

1.2 Post Completion Auditing: Motivation for the research problem and the research questions

According to Huikka (2008), a PCA of capital investments can be described as a formal process that checks the outcomes of individual investment projects after the initial investment is completed and the project is operational. At HNS, a similar definition is used but is defined as a 'post audit'. PCA is used as an evaluation tool by companies in order to learn from positive and negative conclusions concerning the performance of investment projects. Capital budgeting is related to PCA because that process is used to assess investments before approval. Targets and criteria set during capital budgeting are input for a PCA to assess whether an investment was a success or not. Consequently, elements used within capital budgeting are relevant for PCA as well. According to Sandahl and Sjögren (2003) assessment methods for capital budgeting used by companies are Payback Time, Discounting Cash Flow methods like Net Present Value and Internal Rate of Return. Hence, these techniques are also used in PCA reports in order to assess the real outcome of an investment or project based on the actual figures. Additional to the financial analysis in a PCA report, qualitative information is used for PCA's, like organizational or planning related evaluations concerning the investment projects. Questions like: was the planning for an investment project appropriate and was the organization of the project efficient and effective are examples of this qualitative evaluation.

One of the main objectives for companies regarding PCA is to enhance Organizational Learning (OL) (Neale and Holmes, 1990; Huikku, 2010). The process concerning PCA can help to reach OL according to Huikku (2010). OL can be enhanced through several elements of the PCA process like the creation and the content of the PCA report itself, the communication of the conclusions and where to store PCA reports in order to maintain the learning's for future projects. Huikku (2010) found that PCA process design, and specifically aspects related to a PCA report and its communication, can play a major role in facilitating or hindering the extent to which PCA enhances OL. Examples of elements within the PCA process that affect OL are: which investments to select for PCA's, who has to execute PCA's, when PCA's should be executed, how the information should be distributed within the organization etc.

Control HNS mentioned that it is currently unknown for the organization if the PCA's executed at HNS lead to OL while this is their objective for conducting PCA's. Therefore, they want to know how HNS should design their PCA process in order to achieve that goal. A problem to note here is that OL cannot be made quantitative within an organization. It is for example hard to measure if the OL has

increased in the last years. But it is according to the literature possible to say how certain elements of PCA, especially concerning its process, are likely to enhance OL.

At HNS, 10 PCA's are conducted yearly of several investments. The department control of HNS is responsible to select and conduct these PCA's. Control HNS selects large and small investments to be audited of which seven will be executed by me. No fixed process is used in order to conduct PCA's.

The goal of this thesis is to design a PCA process that supports OL. In order to do so, this thesis will firstly investigate what the requirements are to achieve OL through a PCA process, according to the literature. Subsequently, these requirements will be adjusted or supplemented based on the results of a study at HNS. Hence, the aim is to deliver a set of requirements for a PCA process that enhances OL, for HNS specifically. Finally, a PCA process will be designed based on these requirements. Therefore, the research question for this thesis is:

What are the requirements for the PCA process at HNS in order to enhance Organizational Learning and how should the PCA process be designed at HNS in order to fulfill these requirements?

The following sub questions are created in order to support the research question above. Every question will be explained shortly.

1. What is Auditing and how is it related to Post Completion Auditing?
Because PCA is important in this thesis it is useful to study first more about auditing in general and its relation with PCA. Subsequently, PCA will be explained according to the literature in order to find answers on this question.

2. What are the objectives for companies to conduct PCA's?
The final objective of this thesis is to design a PCA process for HNS. Hence, it is valuable to know more about the goals to conduct PCA's within organizations. The new PCA process should support these objectives in order to be effective. Therefore, they will be considered during the design of this new process.

3. How is target setting during Capital Budgeting related to Post Completion Auditing? And how should these targets be created in order to be useful for the PCA process?
Capital Budgeting is the process before the investment in which a company decides to approve an investment or not. The targets or criteria set during Capital Budgeting are the starting points for PCA and can therefore be important for the final quality of PCA. Hence, it will be investigated to what extent, and how, this part of Capital Budgeting is related to PCA. Further, because the formulation of these targets influences the final quality of PCA, and subsequently the related learning's of PCA, it is likely that they influence the level of OL as well. Therefore, the question how these targets can be useful for the PCA process will be studied as well.

4. What is Organizational Learning and how can this be achieved through a PCA process according to the literature?
PCA results can result into learning's like certain estimations or assumptions estimated during the creation of the business case. It is only unknown for me how these learning's can be incorporated

within an organization. Therefore, it is investigated what OL exactly is, what its relation with PCA is, and how OL can be achieved through a PCA process.

The four questions above will be explained according to the literature study in section three of this thesis. Aim is to create a set of requirements according to the literature for the design of a PCA process which results in OL. The last three questions will be studied at HNS. Findings from the literature will be compared here with the findings at HNS. Goal of the last three questions is to find if there are additional requirements to achieve OL at HNS compared with the findings of the literature.

5. What are the objectives for Heineken Nederland Supply to conduct Post Completion Audits and how can they be considered in the new Post Completion Auditing process?
The final PCA process is created for HNS and therefore it is studied what their objectives are to conduct PCA. Possibly there are other objectives than OL only to conduct PCA which have to be considered in the new PCA process.

6. What are the requirements to ensure that targets set in the investment proposals of HNS are useful for PCA's?
Target setting during capital budgeting, at HNS referred as the investment proposal, can influence the final quality of the PCA reports and its related learning´s. Here it is investigated how they should be set at HNS in order to be useful for PCA, and hence, to enhance the quality of PCA. A higher quality of PCA is likely to improve OL which is the reason to study this question in this thesis.

7. Which elements of the sub processes information acquisition, information distribution/interpretation and organizational memory can be incorporated within the new PCA process in order to enhance Organizational Learning?
The sub processes of organizational learning: information acquisition, information distribution / interpretation and organizational memory have to be considered in the new process in order to enhance OL. The findings to incorporate elements that enhance these sub processes within a PCA process will be used as design requirements for the PCA process.

After these questions are answered, a set of requirements is made for the design of a PCA process for HNS. Subsequently, this thesis will design the PCA process which will be implemented within HNS. This thesis will conclude with an evaluation of the PCA process and further conclusions and recommendations concerning the achievement of OL through a PCA process.

1.3 Structure of the thesis

The next chapter will focus on the research design, methodology and data for this thesis. After that, chapter three will focus on the first four research questions. Subsequently, chapter four will discuss the last three research questions. Chapter five is the design chapter of this thesis, the design of a PCA process will be discussed and delivered here. Finally, conclusions and recommendations are given in chapter six.

2. Design, method, data and quality of the research

In section 2.1 and 2.2 of this chapter, the research design of this thesis and the used research methods to gain the data for this the research are explained. Consequently, in section 2.3 is explained how the data will be analyzed in order to draw conclusions regarding the research. The last section, 2.4, will focus on the quality requirements of the research.

2.1 Design study

The main objective of this thesis is to design a PCA process for HNS. As mentioned by van Aken et al. (2007): 'designing is the process of determining the required function of an object to be designed, combined with making a model of it'. In this thesis, the design process in figure 2 is used which is explained in the book Problem Solving in Organizations of van Aken et al. (2007). This design process is selected for this thesis because I think it is a clear and transparent process which is easy to understand for the employees of HNS as well. The essence of this designing process consists of two steps:

1. Synthesis: a first rough concept of the new process with drawings and texts of the design to be realized.
2. An evaluation of the expected performance of the developed synthesis against specifications 'on paper'.

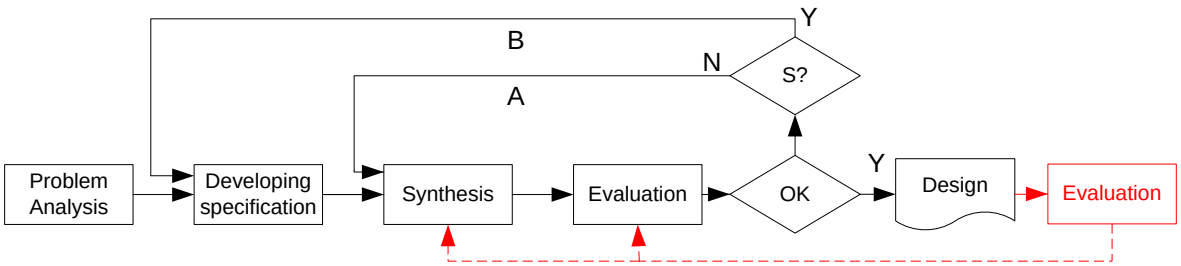


Figure 2, Design process of van Aken et al. (2007). Note, red box and arrows are added in this thesis.

The different steps in this design process for the research are explained below. Firstly, the iterations in the process need some clarification. Iteration A is taken if the evaluation of the synthesis does not give a satisfactory (S) result. Hence, a new or adapted synthesis needs to be created and a re-evaluation will take place. If this process fails, another iteration step is required (B) which requires an adaption of the developing specifications.

The problem statement, which is the starting point of the design process, was already given in the first chapter: *HNS does not have a fixed process in order to conduct PCA's. Consequently, it is currently unknown for the organization if they conduct PCA's in an efficient and correct way and if it leads to Organizational Learning.*

The second step of the design process, developing specifications, will be created based on the conclusions and findings of the research questions of this thesis. As mentioned, these specifications will consist of requirements derived from answers on the research questions. The questions, and the method to find answers on these questions are given in figure 3.

Research Questions	*Research Method*
1. What is Auditing and how is it related to Post Completion Auditing?	Literature about auditing: Merchant van der Stede (2007) and the Institute for Internal Auditors (2008). Literature about PCA: Huikku (2008)
2. What are the objectives for companies to conduct PCA's	Research in literature about the objectives of PCA. Literature used: Neale and Holmes (1990), Huikku (2008), Smith (1994), Gulliver (1987), Van Zedtwitz (2002).
3. How is target setting during Capital Budgeting related to Post Completion Auditing? And how should these targets be created in order to be useful for the PCA process?	Literature about Capital Budgeting, target setting and techniques used for Capital Budgeting: Baker and Powel (2005), Sandahl and Sjogren (2003), Berry and Jarvis (2005).
4. What is Organizational Learning and how can this be achieved through a PCA process according to the literature?	Literature about OL: Flores et al. (2012), López et al. (2005), Jiménéz and Cegarro-Navarro (2007), Huber (1991), Neale and Holmes (1990, Azzone and Maccarrone (2001), Huikku (2008), Welch et al. (2005), Mills and Kenedy (1993).
5. What are the objectives for Heineken Nederland Supply to conduct Post Completion Audits and how can they be considered in the new Post Completion Auditing process?	- Interviews with Control/Project Management/New Product Introduction Managers of HNS. Discussing their objectives and the objectives mentioned in the literature. - Case study of PCA's: they show what the objectives were for HNS to conduct these PCA's.
6. What are the requirements to ensure that targets set in the investment proposals of HNS are useful for PCA's?	- Case study of PCA's: Gives insight whether targets set for investments at HNS are useful for PCA and how they have to be set to be useful. - Interviews with Control/Project Management/New Product Introduction Managers of HNS concerning target setting for investments. Input for these interviews were the results of the literature and of the case study.
7. Which elements of the sub processes information acquisition, information distribution/interpretation and organizational memory can be incorporated within the new PCA process in order to enhance Organizational Learning?	- Interviews with Control/Project Management/New Product Introduction Managers/TPM and IT manager. The proposals derived from the literature were discussed with these stakeholders in order to assess which elements of the subprocesses can be incorporated within HNS. - The case study of PCA's: Because I conducted several PCA's I'll be able to assess if the suggested solutions of the literature and by the interviewees are feasible or not.

Figure 3, the research questions and the research method

After the research questions are answered, a framework with requirements is created which is the input for the next step. This is, as shown in the design process of figure 2, the synthesis, which is the

proposal for a new PCA process. The design of the PCA process will be performed in this thesis and evaluated by the stakeholders. This is also the next step after the synthesis as shown in figure 2.

The synthesis will be evaluated by my supervisors of HNS, the head of controlling HNS and the functional head of the project managers. They are seen as the stakeholders because HNS control, which includes my supervisors as well, are responsible for conducting PCA (and hence for the process) within the organization. Project management is also selected to evaluate the proposed PCA process because they are the executors of the investment projects that are audited.

The evaluation of the proposed PCA process is based on the question if it achieved the set of specifications. If it is evaluated negatively (S? in figure 2) one of the iteration steps will be taken in order to improve the proposal. If the concept of the PCA process is approved, which is indicated as OK in figure 2, the PCA process design can be made final.

According to van Aken et al. (2007), the final design is the last step of the design process but that is probably not the case in reality. The environment is constantly changing within and outside HNS which influences this PCA process as well. Besides this, when the PCA process is finally used in practice, elements or specifications could have been overseen during the development of the PCA process. Therefore, the red evaluation box with iteration steps (red arrows) is added in the process. This evaluation step will be a review of the PCA process concerning its functioning after one year.

In the next section of this chapter, the research methods to gather the data for my research questions are discussed.

2.2 Research Methods: literature study, case study, survey, documentation and participative observation

According to van Aken et al. (2007), two different research methods are distinguished by literature: qualitative and quantitative research methods. Creswell (2008) mentioned that a combination of both quantitative and qualitative research is also possible. 'Qualitative research methods are particularly important if one intends to study people, groups, organizations and societies. Some authors define qualitative methods in a more specific manner. For example, it is claimed that a study is qualitative when the research data consist of texts of which the textual nature is retained in analysis' (Van Aken et al., 2007). Graham Gibbs (2002) defined qualitative research methods in a number of different ways:

- by analyzing experiences of individuals or groups,
- by analyzing interactions and communications,
- by analyzing documents or similar traces of experiences or interactions.

The nature of this thesis is qualitative instead of quantitative. To develop specifications for the design of the new PCA process, input is necessary from employees within HNS. This can provide other views or opinions additional to the literature on how to enhance OL within a PCA process.

In order to find answers on the first four questions, a literature study will be conducted. For the last three questions, case study and survey will be used. Besides that, documentation and participative observation is used. The use and explanation of these qualitative research methods are outlined in the next section.

2.2.1 Literature study

Literature is used to obtain more knowledge about PCA, Capital Budgeting and OL in order to answer the first four questions. 'In fact both the scholarly and the management literature provide a wealth of solution concepts, and general ideas on how to plan an organize business activities of all kinds' (van Aken et al., 2007).

2.2.2 Case study

In order to know how PCA's are conducted at HNS, a case study will be conducted. With the case study, more detailed information and accurate data can be obtained to uncover insights on what PCA's are in practice within HNS. It is a useful method which enables to expand and generalize theories from prior literature by combining with new empirical insight (Vissak, 2010). The case study is based on seven PCA's within HNS conducted by myself. This will give useful insight on how PCA's are conducted and what the current problems and challenges are within HNS. Both are useful input for the final PCA process.

Three of the PCA's are mentioned shortly below in order to give an example of these projects.

1. Introduction of a new product of Heineken called 'Globall' (see fig. 4). HNS invested in a new line in order to be able to produce this product. Several elements are relevant for the success of this new line and product which are input for the PCA. Examples are: estimated production volume, efficiency of the line, number of required operators on the line etc.
2. Replacement of a pasteurizer on a production line. This is a machine which is required on every production line within HNS. Main elements here are: comparison of the budgeted investment amount with the actual invested amount, efficiency KPI's from the business case like energy/steam/water uses of the machine.
3. Introduction of the Heineken Aluminum 'Star' Bottle which is shown in figure 4. This is a small investment, only a few machines had to be adjusted on an already existing line, but it had a great impact on different aspects. An example is that it was not expected that the operational costs for these lines would increase enormously. Consequently, the reasons for these deviations compared with the business case will be studied in the PCA.

Figure 4, The aluminum 'Star' bottle and the 'Globall' of Heineken

2.2.3 Survey research

Interview is a primary data gathering instrument. The questions will be prepared before the meetings and are semi-structured. Semi-structured interview offers sufficient flexibility to approach different interviewees differently while still covering the same areas of data collection. The set of requirements for the design of a PCA process, based on the findings from the literature in chapter three, are explained by me during each interview in order to give the interviewee more insight on the theoretical background. During the interviews the current practices and problems at HNS concerning PCA are discussed, and compared with the findings from the theory, in order to find answers on the last three research questions. Examples of the discussed subjects concerning PCA are:

- Objectives of the stakeholders to conduct PCA's at HNS.
- Target setting during investment proposals at HNS; how are these targets currently created and can they be used afterwards for PCA?
- The sub processes of organizational Learning; information acquisition, distribution/interpretation and organizational memory. Which elements can be incorporated within the PCA process in order to enhance Organizational Learning?

As mentioned earlier, the key stakeholders for the PCA process of HNS are members of the department control and project management. Hence, employees of both departments will be interviewed.

In order to obtain additional input for the creation of the PCA process, two employees at Vrumona will also be interviewed to share their experience with PCA. The main objective for conducting PCA of that organization is also OL and they can therefore provide useful information how they try to achieve that goal. Vrumona is a soft drink producer of Heineken in Bunnik, the Netherlands.

Further, interviews are done with the knowledge manager of HNS, TPM manager and an IT manager (how to document the learning's effectively) to obtain current practices of HNS to achieve OL. All the interviewees are stated below:

- 2 Brewery Controllers (in Zoeterwoude and in Den Bosch)
- 1 Logistic Controller
- 1 Controller at Vrumona
- Supply Chain Director Vrumona
- Head of Controlling of Heineken Nederland Supply
- 3 Supply Chain Controllers
- 2 Project managers in Den Bosch and Zoeterwoude
- 1 'New Product Introduction' manager
- 1 Knowledge Manager of Heineken
- Information Technology Manager
- 1 Total Productive Manager

In order to conduct the interviews, the questions will be prepared beforehand and next step appointments will be made with the chosen interviewees if necessary.

2.2.4 Documentation and Participative Observation

The last research methods are documentation and participative observation. Documentation is a useful source for this research. 'Think for example of annual reports, minutes of meetings, mission statements, policy documents, incident reports, procedures, memos, correspondence and all kinds of databases' (van Aken et al., 2007). In this case, previous PCA reports, investment procedures, fund applications etc. will be used.

The research method participative observation is in this research combined with the case study. I'll have to conduct several PCA's which enables me to experience life from an insider's perspective. To conduct PCA's I will have to speak to many employees within the company who'll give their opinion and information about conducting PCA's. Consequently, these insights can be considered during the development of the set of specifications for the final design of the PCA process.

2.3 Analysis of the Data

The results of the case study will reveal how PCA's are conducted at HNS and what the content of these reports is. Moreover, it will also show how the learning's are communicated within the company and what HNS finally does with these findings. The study of this current situation is important in order to see where the differences are compared with the literature and to discover the current problems and successes within HNS. Both will be used as input for the surveys in order to find the right set of requirements for the PCA process.

All the surveys will be documented to maintain the results. Hence, the findings can always be studied during the writing of this thesis and for eventual future research. The answers and information given will be separated for every research question in order to structure all interviews. This will give the advantage that the specific parts or subjects of the interviews can be found more easily. To give answer on the research questions, all the structured interviews will be used in order to consider all the results received from the interviewees.

Several documents, as mentioned in previous section, will be analyzed. These documents will be registered if they were used for the analysis of the questions or for the design of the PCA process.

2.4. Quality criteria for the research

Essential for this thesis is the quality of the research itself. 'If a product does not meet its associated quality criteria, it loses much of its value' (van Aken et al., 2007). Consequently, the aim of the research is to yield true conclusions on which the requirements for the new PCA design is based. Van Aken et al. (2007) recognized controllability, reliability, validity and recognition of results as important factors for the quality of this research. The mind map in figure 5 summarizes the main points concerning the quality of this research related to these four factors. These are discussed below in sequence.

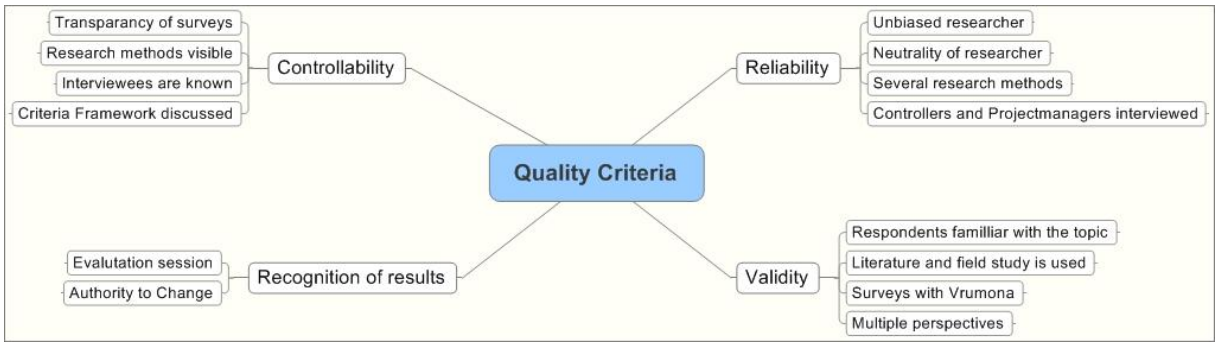


Figure 5, link of the four quality criteria of van Aken et al. (2007) with this thesis

2.4.1 Controllability

In this research, the surveys and research methods are transparent and hence could be repeated by another researcher. 'As a rule of thumb a study should be described in such a way that somebody else is able to repeat it' (van Aken et al., 2007). Therefore, the survey data is available for the organization itself and the research methods are discussed and approved by supervisors of both HNS and the University of Twente. Further, the interviewees chosen by the researcher are known so it is controllable where and how the information is gathered.

The set of requirements which is developed for the design of the PCA process will be approved by employees of control and project management. This approval step will enhance the transparency, and also, the controllability of this research.

2.4.2 Reliability

The second factor discussed by van Aken et al. (2007) is reliability. According to van Aken et al. (2007), four potential sources of bias can be recognized in the methodological literature. These are the researcher, the instrument, the interviewees and the situation.

'Research results are (more) reliable when they are independent of the person who has conducted the study' (van Aken et al., 2007). In this case, I'll try to keep as independent and neutral as possible. Because of the small duration of the master thesis and the fact that it is accepted within the company to conduct this thesis, it is easier to keep independent during the research. This can be achieved through interviewing the relevant people within the company so different visions and opinions can be considered during the design of the PCA process.

In order to gather the data for this research, several research methods are used. Van Aken et al. (2007) mentioned that the reliability will increase when more research methods are used. If all methods yield the same conclusions, the reliability will be higher. Therefore, the study at HNS is performed by a case study of PCA's and surveys. If both research methods reveal the same results, the conclusions are likely to be more reliable. This is also the case concerning the requirements for a PCA process to enhance OL. If the findings from the literature are also supported by the interviewees, it is more likely that the created requirements for the PCA process are reliable.

2.4.3 Validity

In this part, the relevant parts of validity concerning this research are discussed. Validity is explained by van Aken et al. (2007) as follow: 'a research result is valid when it is justified by the way it is generated'. In other words, are the created conclusions derived from the different research methods

valid? In the mind map of figure 5, four points are mentioned related to validity which are explained shortly below.

The first one is that the interviewees are familiar with the topic and hence with the concepts PCA, Capital Budgeting and Organizational Learning. Because these concepts are not new for them, critical reflection and evaluation of the results will be given which enhances the validity of the research. A second point is that the concepts will be studied both in literature and in reality through case studies and surveys. If the explanation of the concepts aligns between these research methods the validity will increase as well. Besides that, surveys are conducted outside the organization of HNS too. Two employees at Vrumona will be interviewed in order to do research on their experience with PCA. If their experiences align with the answers of the employees within HNS, it will enhance the validity of this research because the results are consistent.

2.4.4 Recognition of Results

Recognisability is explained according to the literature as follow: 'Recognisability refers to the degree to which the principal client, the problem owner and other organization members, recognize research results in business problem solving projects' (van Aken et al., 2007). The set of requirements for the PCA process is discussed with the department project management and the department of control. Finally, the design will be evaluated in a session with all principals. Hence, they all have to agree before the final design will be delivered. If all principles agree on both developing specifications and the design, it is more likely that they'll also support the new process within the organization. Hence, the change of successful implementation will become higher.

3. Literature Review: Capital Budgeting, Post Completion Auditing and Organizational Learning

In this part of the research the relevant literature is outlined in order to give answer on the first four research questions.

1. What is Auditing and how is it related to Post Completion Auditing?
2. What are the objectives for companies to conduct PCA's?
3. How is target setting during Capital Budgeting related to Post Completion Auditing? And how should these targets be created in order to be useful for the PCA process?
4. What is Organizational Learning and how can this be achieved through a PCA process according to the literature?

In this literature review chapter, auditing in general will be explained firstly together with its relationship with PCA. Secondly, it is studied what the objectives are to conduct PCA's. If for example an objective is to use PCA's for future decision making, than, the process should consider how to ensure that reports can and will be used in future. Thirdly, the connection between capital budgeting and PCA will be explained. The targets set during the capital budgeting process are the starting point of a PCA and should therefore be considered during the development of the PCA process. After that, the relationship between PCA's and OL is discussed according to the literature.

The conclusions of the following three sections will be used, together with the findings of the surveys and the case study in chapter 4, for the final set of specifications for the design of the PCA process.

3.1 Explanation of Auditing and its connection with Post Completion Auditing

As explained in the introduction of this chapter, the following question will be discussed first:
1. *What is Auditing and how is it related to Post Completion Auditing?*

In order to find an answer on this question the definitions of both auditing and PCA will be given below. The similarity and difference between these two will be discussed in the conclusion in order to see their relation.

The definition of PCA was already given in chapter one: 'a PCA of capital investments can be described as a formal process that checks the outcomes of individual investment projects after the initial investment is completed and the project is operational' (Huikku, 2008). Hence, a PCA checks if the targets or criteria of an investment, on which the approval is based, are met. The conclusions refer to the achievement of the set targets and will provide insight to companies about the successes or failures of the project.

The terminology of an 'audit' is very broad. It is often referred to financial audits like the correctness of the financial statements of a company or for example a tax audit whereby the government assesses if the tax laws are applied correctly. Other examples are internal audits, operational audits and performance audits.

According to Merchant and van der Stede (2007) an audit can be defined as follow: 'a systematic process of (1) objectively obtaining and evaluating evidence regarding objects of importance, (2)

judging the degree of correspondence between those objects and certain criteria, and (3) communicating the results to interested users.

The institute for internal auditors (IIA) in the Netherlands gives the following definition for an internal audit: 'Internal auditing is an independent and objective assurance and consulting activity designed to add value and improve an organization's operations' (IIA, 2008).

Conclusion

The names of 'auditing' and 'post completion auditing' suggest that they are related to each other. However, the goals of both concepts reveal that PCA is different from auditing and should be seen as an investment review.

A target for auditing in general is to provide assurance to companies about, for example, their processes or information. For example, companies need to provide assurance about the information they deliver about their financial statements. This has to be performed by independent persons in order to guarantee objectivity.

The target for PCA is to assess whether the targets of an investment are achieved or not. The deviation of these targets, concerning the budgeted and their actual performance are input for future investment projects. Organizations want to learn from executed projects and want to know what went well or bad. PCA can therefore be seen more as a review of an investment rather than an audit because it focusses more on reviewing of the performance than providing assurance about an investment. But, because the literature and HNS refer to PCA this definition will be used in this thesis as well.

3.2 Objectives of Post Completion Auditing

The following sub question will be answered in this section:
2. What are the objectives for companies to conduct PCA's?

There are multiple objectives mentioned in the literature to conduct PCA's. Neale and Holmes (1990) found several reasons of managers to conduct PCA's based on surveys with managers of different companies in the U.K. These objectives can be classified into three groups: (1) creation of more realistic and objective investment appraisals; (2) Improvement of the capital budgeting process concerning the evaluation of future capital investments; (3) Alterations to or abandonment of the project, or similar projects which are already on stream.

(1) Creation of more realistic and objective investment appraisals

An objective of PCA mentioned by Neale and Holmes (1990) is to encourage employees to initiate investment proposals more realistic and objective because the final results of the investment will be monitored in future. Managers mentioned in the research of Huikku (2008) that PCA's within organizations can reduce intentional over optimism in investment proposals. If employees are aware that the achievements will be audited enhances realism in plans according some managers. Examples are estimated sales of a new product, operational costs, performance indicators etc.

Hence, PCA can prevent too optimistic investment proposals intended to increase the chance of

approval of managers or the board of directors. Huikku (2007) and Smith (1994) also mentioned that PCA will heighten the integrity in the investment process.

(2) Improvement of the capital budgeting process concerning the evaluation of future capital investments

PCA's will help managers to improve the evaluation of future capital investments (Neale and Holmes, 1990). Mistakes made by employees in the past can be very useful for current or future investment appraisals. For example, estimated numbers or assumptions made for the creation of business cases in the past could be estimated incorrectly due to several reasons. These learning's are beneficial to future projects, the feedback provided by a PCA will give input for future project definition, selection and execution (Gulliver, 1987). Note that these learning's can also be based on successes in the past.

(3) Alterations to or abandonment of the project or similar projects which are already on stream

The third objective of PCA's according to Neale and Holmes (1990) is that PCA's can help to improve the performance of investment projects which are already on stream but underperform as actual planned. Another option is to abandon similar projects. The reasons for problems occurred at similar investments can be applicable to current investment projects as well. PCA's can therefore help managers to 'steer' current projects in order to improve their performance.

According to Gulliver (1987) a PCA can be used to check if a project performance is as initially intended. Besides that, a PCA can be used as an official round up of an investment project (Van Zedtwitz, 2002).

Conclusion

The objectives concerning PCA are related to decision-making control and OL of which the latter is considered as the main goal in literature. The companies investigated in the study of Huikku (2008) stated that OL is the key objective to conduct PCA's within their organization. 'Relevance of PCA's role in OL is also clearly supported by the numerous comments of the managers advocating PCA's concrete impacts' (Huikku, 2008). PCA allows organizations to learn from successful projects and failures from the past in order to enhance future decision making. Because the main objective for conducting PCA is OL according to the literature, it will be included in the set of specifications for the new PCA process of HNS.

As mentioned earlier, the learning's as a result of PCA are based on the assessment whether the targets or criteria of an investment are achieved or not. It is therefore logically that the level of quality concerning the settlement of these criteria influences the quality of PCA. A higher quality of PCA is likely to lead to better results concerning the learning's of investment projects. Therefore, the relation between capital budgeting and post completion auditing, and its goal OL, is investigated in the next section.

3.3 Capital Budgeting and its relation with post completion auditing

During the pré-phase of an investment, an investment proposal is written. It consists of several components. Examples are an analysis of the profitability of that investment, the organization of the

project to execute the investment and the explanation of the related goals. In the literature, this process is described as the capital budgeting process. The targets set in this process are input for a PCA. The goal of this chapter is to identify which targets are used for capital budgeting and how they should be created in order to be useful for a PCA. Hence, the following question will be discussed as explained earlier in the introduction of this thesis.

3. How is target setting during Capital Budgeting related to Post Completion Auditing? And how should these targets be created in order to be useful for the PCA process?

Introduction to capital budgeting

Firstly, the process of Capital Budgeting is explained in this section. According to Baker and English (2011) Capital Budgeting is a managerial process for the decision making process about capital expenditures and long-term investments. It is a process of planning and analyzing (how to reach long-term goals) and the selection and management of capital investments. Managers use an organizations capital (long-term funds) to invest in capital goods (e.g. replacement of assets, expanding product lines), which allows organizations to generate future cash flows.

Capital Budgeting concerns investment decisions, which means the allocation of an organizations fund (deploying organizational resources influencing the organizational performance and future direction) to reach their objectives.

According to Baker and Powel (2005), capital budgeting is a process with interrelated steps. It is a combination of steps (six stages) to generate proposals on long-term investments, namely:

1. Identification of project proposals: Developing and providing first screening outcomes of the project proposals.
2. Estimation of project cash flows: Identification and estimation of the cash flows for the project proposals.
3. Evaluation of the projects: Determining the projects financial feasibility and viability through the evaluation of the cash flows.
4. Selection of projects: Selecting the projects that measure up to the criteria of selection.
5. Implementation and monitoring of the selected projects
6. Performing a PCA: Comparing the actual project cash flows with the estimated project cash flows (capital budgeting proposal) periodically.

The first four steps require companies to estimate the feasibility of an investment project and to decide on which criteria the decision to invest is based. The techniques used to estimate the financial feasibility of a project are explained below.

The last two steps explain the relationship between PCA and capital budgeting. The estimated cash flows in the first stages of capital budgeting are here compared with the actual cash flows of a project. The latter is performed during PCA. Note that the emphasis of Baker and Powel (2005) is cash flows, but there are more objectives which can be audited of an investment. Examples are the planning, certain efficiency targets, the process etc.

Techniques used for capital budgeting

There are different techniques used to assess the financial feasibility of an investment proposal during the capital budgeting process. The two main ones, according to a research of Sandahl and Sjogren (2003), are Net Present Value and Payback Time and will be discussed shortly below.

- Net Present Value (NPV) → the value obtained by discounting all cash outflows and inflows of an investment opportunity by a chosen rate of return (Berry and Jarvis 2005).
- Pay Back Time (PBT) → the period, usually expressed in years, which it takes the cash inflows from an investment equals the cash outflows (Berry and Jarvis, 2005).

Note that both techniques are based on cash (in- and outflow), and thus, do not consider for example depreciation or accrual accounting concepts.

Targets derived from the capital budgeting process.

The financial feasibility can be estimated through, for example, a NPV or PBT calculation. These techniques are based on several estimated elements like:

- Cash flows of the investment
- Expected savings → E.g. a reduction of FTE's, increase of efficiency, lower energy costs during production, etc.
- Assumptions like a certain volume output, tax charge, specifications of a new machine concerning its performance.

If the elements on which the analysis of the financial feasibility of a project are not reached it is likely that the intended financial feasibility will not be met either. Hence, deviations of these elements concerning their estimated and actual performance can help companies to assess and to understand what the final performance is of the investment project. It will reveal whether the estimated financial feasibility was valid and if management has made a right decision to invest or not. Therefore, these elements can be seen as the targets or criteria for the success of an investment project. This also explains why they are the starting points for an auditor to conduct a PCA. The reasons, in hindsight, why the actual performance deviate from the estimated performance can result in learning's for future projects.

Note that the usefulness of these criteria is depended on how they are set. Some questions concerning their usefulness are: can the targets be identified in business case, can they be measured within the company and hence, is the required data available. Therefore, their usefulness will increase if these targets are set Specific, Meaningful, Attainable, Relevant and Timely (SMART) during Capital Budgeting.

Conclusion

During capital budgeting, the financial feasibility of an investment is made based on several estimated elements. During a PCA, these estimated elements are compared with their actual performance and are seen as criteria for the success of the investment project. The reason for this is that they explain on which an investment was estimated as financial feasible. This relationship is visualized in figure 6 and explains the connection between capital budgeting and PCA.

If the criteria set during capital budgeting are unclear or cannot be measured, it is hard to assess the success of an investment and hence the quality of a PCA will decline. The learning's will become less valid which negatively influences OL. Therefore, two points are essential for the new PCA process of HNS: criteria have to be available for every investment (as shown in the figure below) and they have to be developed SMART in order to be useful for the PCA.

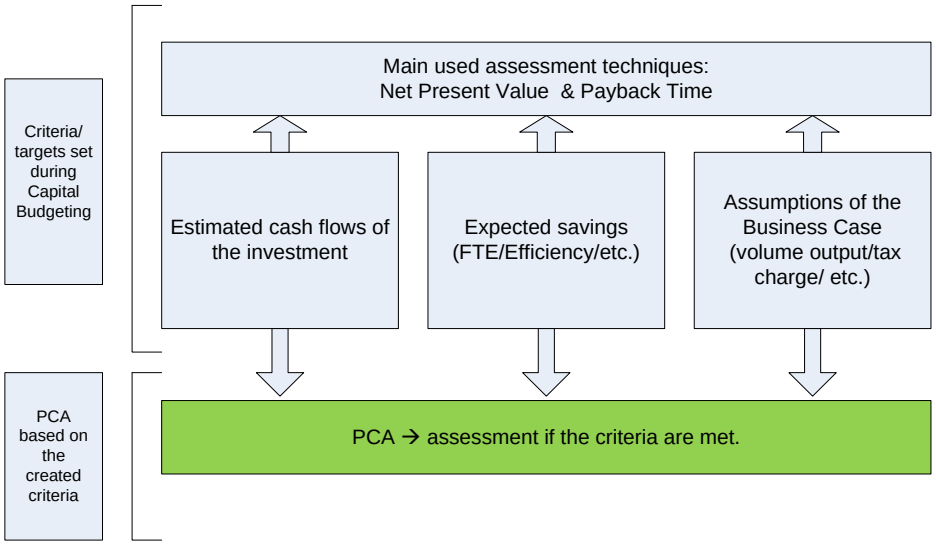


Figure 6, Explanation of relationship between PCA and Capital Budgeting

3.4 Organizational Learning and its relation to Post Completion Audits

In this part of the literature study fourth sub question is discussed:

4. What is Organizational Learning and how can this be achieved through a PCA process according to the literature?

Firstly, Organizational Learning (OL) will be explained according to the literature. Subsequently, it will be studied how OL can be achieved through the PCA process in order to gather design requirements for the new PCA process at HNS.

Organizational Learning: explanation of the concept.

Flores et al. (2012) explain that the concept of OL is about the capability of organizations to innovate, to continuously change and organizational renewing. According to research on OL, the concept increases an organization overall effectiveness, and thus resulting in improvements on an organizations performance. López et al. (2005) argue that the capability of organizations to learn faster can be seen as a competitive advantage, especially in volatile environments.

According to Jiménez-Jiménez and Cegarra-Navarro (2007) OL is a mechanism which organizations use to bundle the knowledge of individuals (mostly employees) into social knowledge. It is a process of understanding knowledge, and a process of continuously updating knowledge. Knowledge that is not updated and/or used does not retain its value. Huber (1991) states that knowledge retains its

value if organizations behold that the acquired knowledge can be useful to their organization, the so called development process of newly acquired knowledge or insights.

OL occurs when employees respond to environmental changes of organizations, and detect and correct possible organizational errors immediately. The knowledge obtained in this process should be corresponded to the organization, so other employees within the organization can use the obtained knowledge as well.

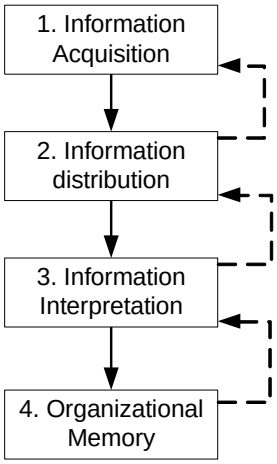


Figure 7, Organizational Learning process

Flores et al. (2012) divide six sub-processes of OL, which we and other literature (Huikku, 2008 and Huber 1991) divide into four different sub processes which are shown in figure 7.

These sub processes generally follow the sequential order as given in figure 7, but, exceptions may occur because the processes are interrelated to each other. In this section is illustrated how an appropriated PCA design can facilitate these sub processes of OL. Each sub process of OL will be explained below together with elements within the PCA process that can enhance the related sub process.

Information acquisition

This is the first step of OL, and is also called information scanning. According to Flores et al. (2012) information acquisition is the organizational process of obtaining information from the internal and external environment. The acquisition of knowledge is the result of effort and experimentation from employees mostly concerning changing factors within and outside the organization. Obtained information can be feedback on processes in the past, and determine how to handle these processes more efficiently in the future.

Neale and Holmes (1990) and Azzone and Maccarrone (2001) state that the essential aspects of a PCA process concerning information acquisition are: selection of projects for PCA; the timing of PCA; the location of responsibility for the PCA system; and the persons conducting PCA. Huikku (2008) builds further on these aspects which will be discussed below in sequence.

<u>Selection criteria of a PCA</u>

Aim of the selection criteria is to choose the investment projects that have the highest potential to deliver OL's. Huikku (2008) found that the most important criterion for the selection of PCA projects is the invested amount. The managers in his study mentioned that the higher the invested amount, the higher the OL of these PCA's are. Besides that, risky and complex investments were considered as 'useful' for PCA's. Main reason is that managers assume that these projects have a higher learning potential for the organization.

Companies can also choose to select the projects randomly. Main advantage here is that behavior of the employees can be influenced since they do not know with certainty if their project will be reviewed in future. It is than more likely that employees will do more realistic investment proposals (Azzone and Maccarrone, 2001). Hence, controllability of employees is in that case the goal of PCA rather than OL.

Timing of PCA's

The timing of PCA's by companies is mostly after 'official' settlement of an investment according to the literature. Further, companies aim to conduct PCA's short after the investment. Main advantage is that it is more likely that employees who were involved with the project still work for the company (ideally in the same function). This enhances the change of availability of information and the reliability of that information.

Location of responsibility and the executors of PCA

Location of responsibility is advised to perform at a high level within the company to ensure enough support for PCA's within the organization. It is more likely that employee's feel that PCA's are important if one of the directors is responsible instead of someone 'lower' in the organization. Hence, they are more willing to support the auditor to obtain the right information in order to conclude the learning's concerning an investment project.

The conductors of PCA must not have any interest in the final results and hence should be objective in order to provide conclusions and learning's from a neutral point of view. Huikku (2008) find that own personnel and people from outside the company work together to conclude the PCA's in order to ensure objectivity. Lambrix and Singhvi (1984) mentioned that a PCA should be conducted by someone who has no interest in the outcome of the PCA, this will also enhance objectivity.

Information distribution and interpretation

According to Flores et al. (2012) the second step of OL is about how the obtained information within organizations is shared between individuals or groups. Information that an individual or group does not share with the rest of the organization, stays individual-/group-level learning, instead of OL. This individual-/group-level learning is organizational knowledge, but is only relevant for the people who obtained the knowledge until it is shared with the rest of an organization. Therefore it is important that organizations do research on how to share knowledge between all the members of the organization to realize possible improvements.

According to Flores et al. (2012) the third step includes the method how to interpret the usefulness of information and how these interpretations form generally understandable knowledge for organizations and their employees. Flores et al. (2012) define interpretation as the process where; 'organizational members interpret organizational realities through a mutual negotiation of cognitive maps' and integration as; 'the establishment of shared observations, discussions and understandings among individuals or groups that lead to a common language and coordinated action'.

Individuals or groups should incorporate the obtained information in their knowledge to arise a shared understanding which can be used for future decision-making processes. The interpretations can be used to trigger new rules and procedures (organizational memory).

Huikku (2008) mentioned three important issues regarding information distribution and integration and their relation with the design of a PCA process. These are: the content of a PCA report; its presentation forum; and dissemination.

Content of the report

Huikku (2008) mentioned that most companies use the same assessment elements for PCA as used in the investment appraisal. Therefore, a prerequisite for PCA is that organizations store documents

concerning investment appraisals, and consequently, are available for PCA conductors. 'Using the same ex-ante and ex-post capital budgeting calculation methods enables the required comparisons' (Huikku, 2008). Accordingly, additional comments in a PCA concerning the achievement of the objectives developed during the investment appraisal. The latter provides insight about the reasons of success or failure of an investment which is useful for OL.

Another finding is that most reports within companies use a standard format and one general language. The latter is especially the case within multinationals; these companies mainly use English as their main language. One standard format will facilitate knowledge transfer through effective retrieval of PCA reports. Welch et al. (2005) also state that the use of one language enhances knowledge transfer within an organization.

Presentation forum

The presentation forum refers to how companies present their PCA's within the company. Most companies have at least one formal forum for PCA's. Azzone and Maccarone (2001) mention that it is common for companies to organize meetings to discuss the results with both PCA conductors and employees who were involved in the investment process. Consequently, action plans or corrective actions can be discussed as well. A common forum enables interaction about the learning's and can facilitate a shared belief about the findings of a PCA. Therefore, Huikku (2008) mentioned that it seems reasonable to suggest that companies would have a forum in which interactive discussions and presentation of PCA results occur, and additionally they would present the results to the approvers of an investment.

Dissemination of PCA reports

Effective dissemination of PCA reports ensures OL according to Mills and Kennedy (1993). It ensures feedback for future investments concerning success and failures of the past. Regarding the dissemination of PCA report, managers mentioned in the study of Huikku (2008) that at least all people involved should be informed about the results of the PCA. Besides that, it is common that results of a PCA are communicated back to their final approvers.

Organizational memory

According to Flores et al. (2012) organizations have to store obtained knowledge in organizational systems to use the knowledge in the future. This same argument is used by Walsh and Ungson (1991) who mention that stored information from a company's history have to be used for present decisions. Threats for losing learning's from the past through turnover of personnel or organizational forgetting can be reduced through organizational memory.

Because of these reasons, Huikku (2008) proposed that, in order to ensure OL, a company should have:

- A database for PCA reports including a register of its content;
- this should be widely known by relevant persons;
- these persons can find and retrieve the appropriate PCA reports.

Conclusion

The conclusion of this section is summarized in figure 8 below. It comprises the four sub processes (sub process 2 and 3 are given together) of OL; elements of a PCA process which enhances these sub processes of OL; detailed suggestions according to the literature to operationalize these elements within the PCA process. These findings, together with the conclusions of the previous sections, will be used as input for the interviews with the stakeholders of the PCA process within HNS in order to come up with a set of requirements. It will be investigated if the interviewees agree with these findings of the literature and if they have additions to these findings. Subsequently, the question to the interviewees is how to incorporate these elements within the organization and to what extent they are already available within HNS.

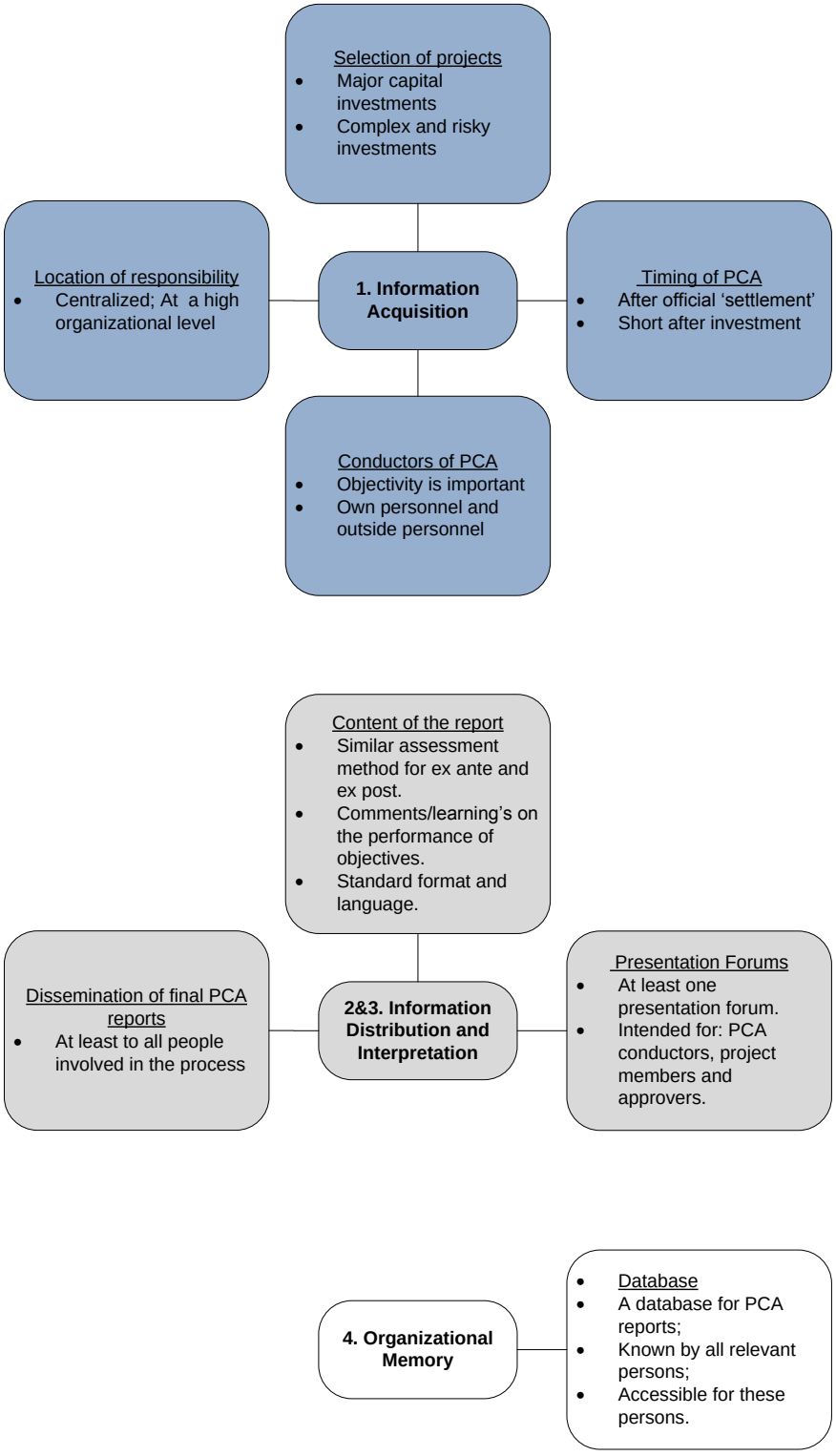


Figure 8, The four sub processes of Organizational Learning and their link with the PCA process

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