

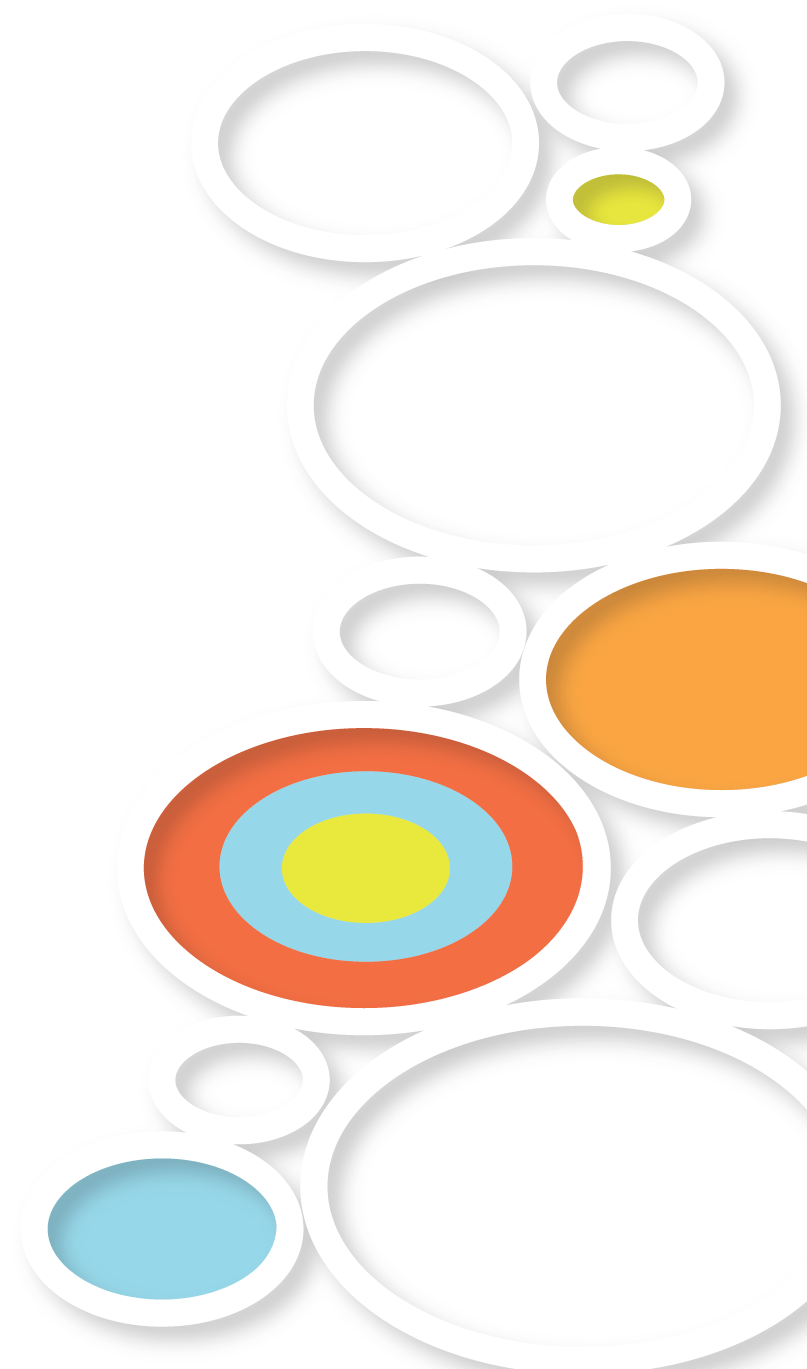
sas[®] forum NEDERLAND 2012

make connections • share ideas • be inspired

Operational Agility

Decision Making at the Speed of Right in Manufacturing

Patrick van Loon



Our World is Changing

Today's Reality

Margin is destroyed by:
wrong product, wrong place,
wrong time, poor quality,
brand image....

Today's Reality

Inside your company,
outside your company,
the real world, the virtual
world....

Today's Reality
Quality is what customers
think it is. We no longer
control our brand in this
rapidly changing digital
world.

**Demand and Supply
Uncertainty**

**Customer
Loyalty is
changing**

**Data, data
and more
data**

The New World

**Margin
Pressure**

Today's Reality
Find the most profitable
growth, take the best actions,
maximize cross-business
impact

**Need for
Product
Innovation**

Today's Reality
Customer retention, upsell, cross sell,
satisfaction, service revenue, social
media, fraud, brand velocity.....



The 'Fog of War'

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Traditional Approaches are not able to manage VUCA

■ Brick-and-Mortar

- Robust, but very inflexible
- Old processes cast in stone
- Long processing cycles
- Example – ERP



■ Picket-Fence

- Stop-gaps for specific issues
- Information may ‘slip through the cracks’
- Instable and not scalable
- Example – Excel ‘add-ons’



The approach to VUCA: 'Sense and Respond'

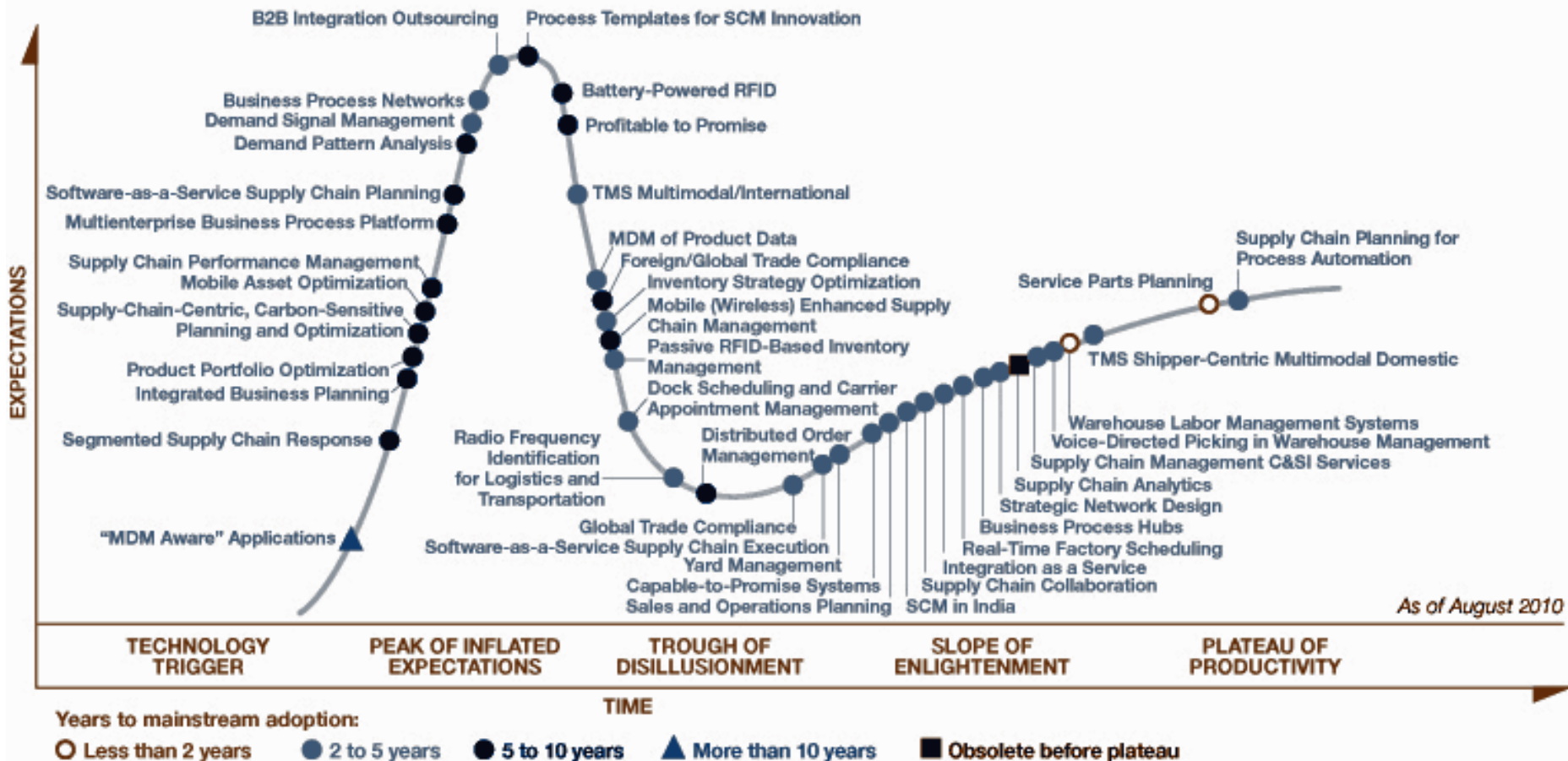
- Know Sooner
 - Past performance is no longer a good indicator for the future
 - External conditions are changing so rapidly that 5-year plans and annual budget cycles are already obsolete when created
 - Not only focus on plan versus actual, but on the consequences
- Act Faster
 - Competition is fierce
 - Information is shared quicker than the speed of light through social media
 - Understand Alternatives

The ability to sense and respond to changes that affect the organization needs to become an integral part of all decision making processes in your company

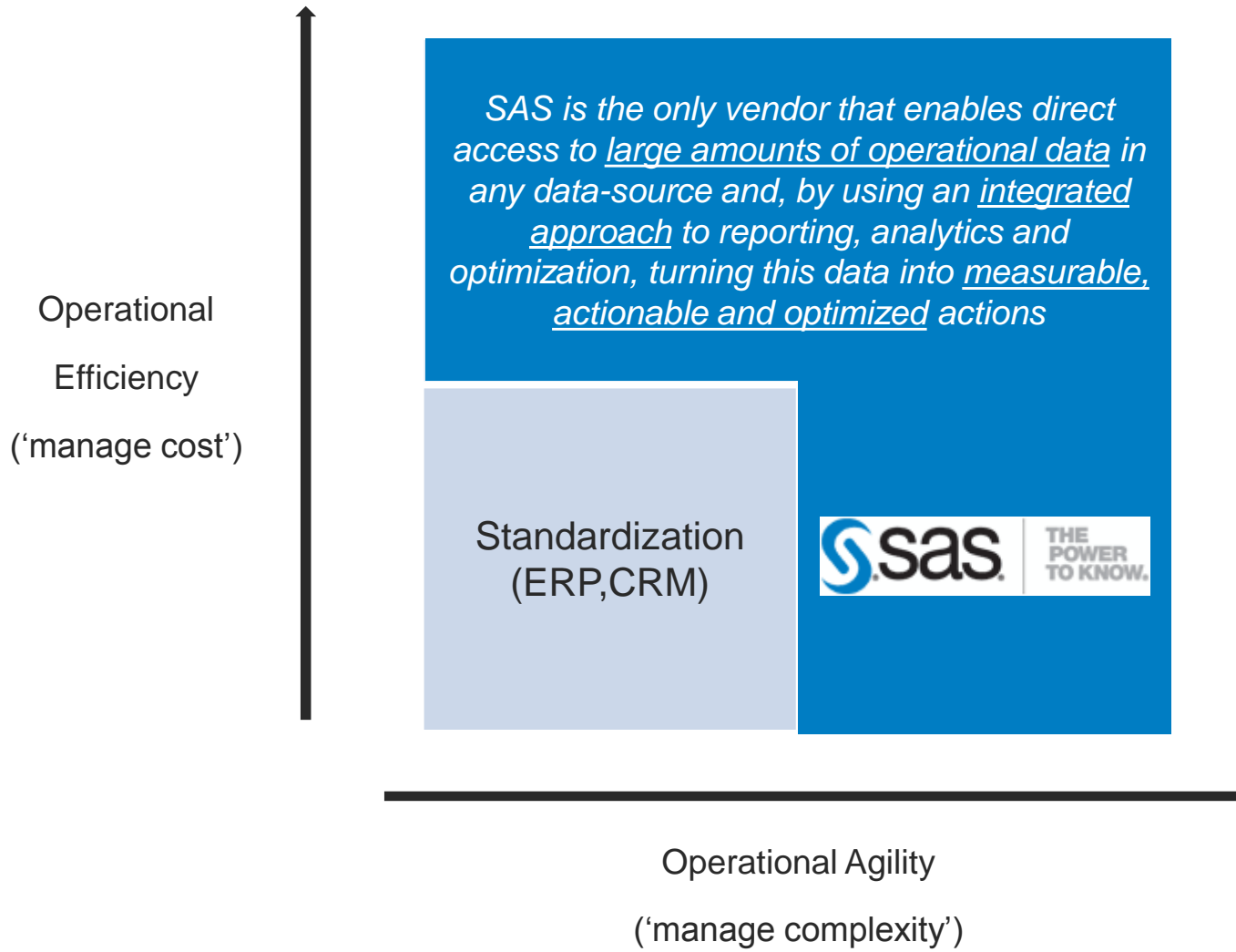


SCM Hype Cycle

Gartner Hype Cycle for Supply Chain Management, 2010



The 2 sides to Operational Excellence



Operational Agility through SAS

Sense Demand Patterns Quicker

What-if scenario analyses

Include External Factors

Predictive Modeling

Extend Forecasting Horizons

Quick error resolution

Find Outliers Quicker

Demand and Supply Shaping

Quickly sense quality issues

Multi-echelon Optimization

Prioritize production issues

Fact-based Decision Making



Demand Driven Planning and Optimization

Business Challenges

- High volatility in product demand due to uncertain market conditions
- High volume of new product launches
- Supply uncertainty due to globally stretched supply chains
- Bullwhip effects in large supply chains drives up inventory whilst service levels are not met

Sense

- Sense demand signals quicker by using a Visual Analytics approach
- Rate demand signals based on their proven relevance
- Extend planning- and forecasting horizon
- Include more (external) factors that allow for a better forecast accuracy
- Find outliers quickly and remove from data-set

Respond

- Improved insight in the underlying drivers of demand and supply gives better control to shape demand and supply by directed actions (price, promotions, sourcing strategies etc.)
- Incorporate what-if scenario analyses into the decision making process using High-Performance Analytics
- Patented multi-echelon Inventory Optimization better aligns inventory with forecasted demand and required service levels



Predictive Asset Maintenance and QLA

Business Challenges

- Downtime due to unplanned maintenance
- Demand for high levels of uptime from customers for critical processes
- Pressure on maintenance budgets
- 'Expert knowledge' is limited available

Sense

- Use large amounts of sensor-data to find those indicators that predict an upcoming failure early.
- Prioritize maintenance activities based on calculated operational impact.
- See yield-excursions early through an integrated data-mining and reporting platform.
- Get insights into the underlying variables for production- and process quality.

Respond

- Using Predictive Models, assets will only be maintained when needed
- Embed best-practices in troubleshooting through pre-defined analytical steps to reduce time to resolution
- Time to develop data-driven model is much reduced, leading to earlier insight and warnings
- Model impact of reducing output to extend lifetime of asset and/or time-to-failure



After-Market Service

Business Challenges

- Customers are more demanding with regards to service
- Effect of 'service reputation' is more profound
- Possible revenue stream from service is exceeding product revenue
- Raising cost in service departments and service inventory

Sense

- Through advanced analytical techniques better forecast service call demand
- Understand effect of service levels on total revenue
- Find misalignments in service organizations through data-mining, call pattern and resolution analysis.
- Follow customer sentiment on social media
- Find underlying root-causes early
- Understand raising warranty claims and find irregular behavior

Respond

- Differentiate service levels to optimize service revenue
- Optimize service parts network (sites and inventory) to dynamic service levels
- Manage and control your service center to ensure optimal customer experience
- Show financial impact of operational decisions at the moment of decision making
- Target suspect claims
- Create a pro-active service culture



Why a new forecasting system?



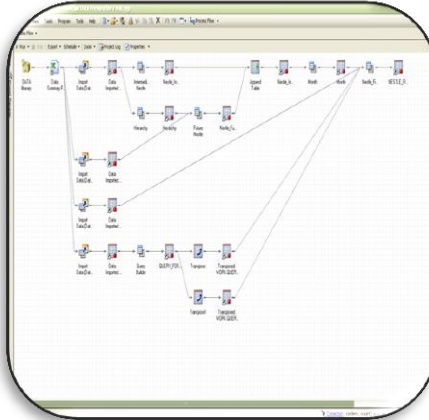
- Requirement to improve forecasting accuracy
 - Short term operational execution
 - Medium to long term financial planning
- Downstream effects on
 - inventory and working capital
 - service levels and
 - overall supply chain process



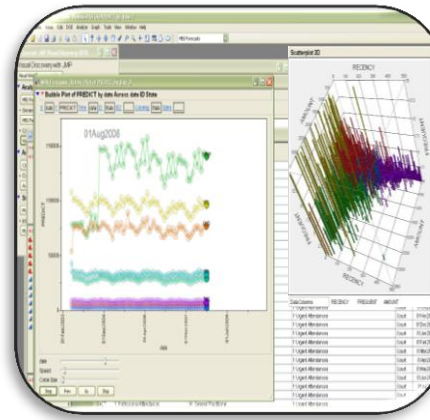
SAS Components

Sense

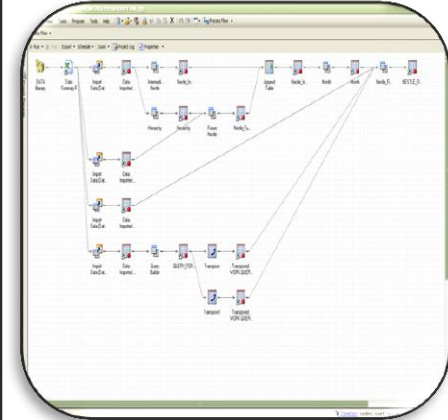
Data Preparation



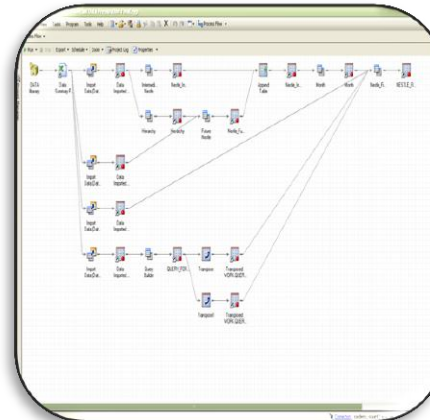
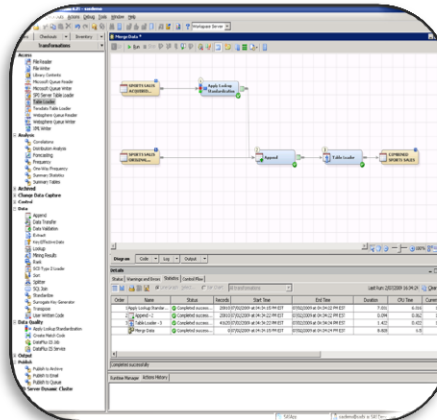
Analysis/Reporting



Forecasting



Respond



Results



■ Capabilities

- Automated mass forecasting
- Hierarchical structure and reconciliation
- Modelling flexibility
- What-if/scenario analysis & overrides
- Multiple fit statistics and graphics
- Embedded forecasting reports

■ Results

- Forecast accuracy improves by 4 percent
- Service levels increase by six percent
- Lifts on promotions increase
- Safety inventory reduced (1% accuracy improvements means 1% inventory reduction)



Insight to drive the right actions



Notifications

- Equipment >1 Notification
 - 1 x 5 Notifications
 - 6 x 4 Notifications
 - 12 x 3 Notifications
 - 84 x 2 Notifications

103 machines

Example

Machine 1008390045

Material

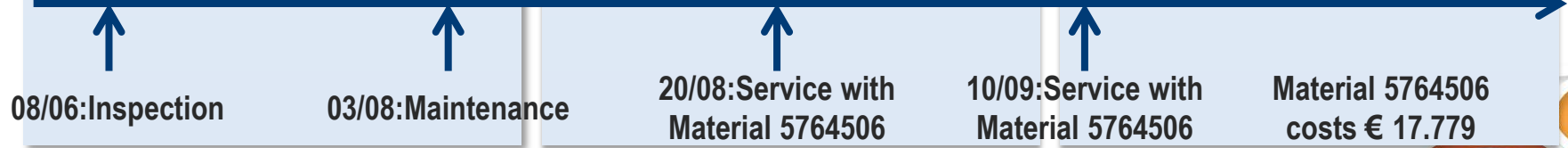
- .. and repeated booking of the same spare
 - 1 x 2 spares
 - 4 x 2 and 2 x 3 spares
 - 6 x 2 and 3 x 3 spares
 - 22 x 2 spares

39 machines

Maintenance

- .. and recent scheduled maintenance
 - none
 - none
 - 2 x 1 Maintenance
 - 7 x 1 and 2 x 2 Maint.

13 machines



Predictive Maintenance



“Our innovations combine state-of-the-art imaging, laboratory diagnostics, and IT solutions for an earlier prevention and more specific diagnosis, thus enhancing patient care.”

Challenge

Siemens wants to offer an extensive selection of services to help their customers achieve best-in-class performance while optimizing costs

- Upgrades and migration
- Service and support
- Education and training

SAS Solution

SAS® Predictive Maintenance

Business Impact

Siemens now offers additional service contracts to its customers based on guaranteed UPTIME Services;

- Real-time monitoring and preventive maintenance of medical hardware and software provides system reliability, thus enabling increased system availability, optimized performance and workflow efficiency.

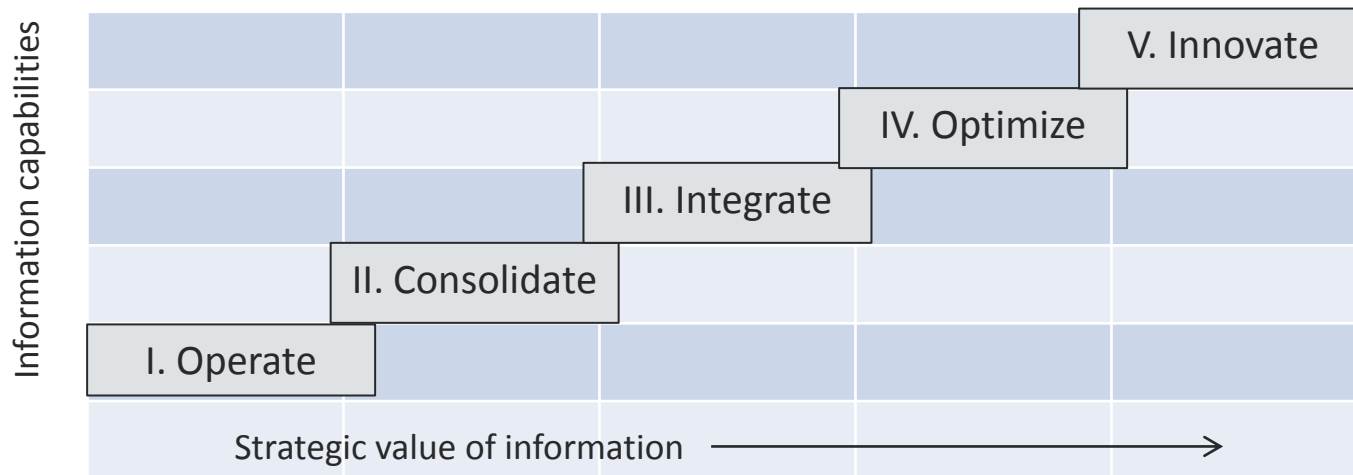


SAS in the Commercial Industries

	Utilities	Manufacturing		Wholesale & Distribution	Retail
		Process	Discrete		
Plan	<ul style="list-style-type: none"> Risk & Trading Management 	<ul style="list-style-type: none"> Strategy Management Activity-Based Management 	<ul style="list-style-type: none"> Strategy Management Activity-Based Management 	<ul style="list-style-type: none"> Network Design (Operations Research) 	<ul style="list-style-type: none"> Revenue Optimization
Source		<ul style="list-style-type: none"> Commodity Classification Spend Analysis 	<ul style="list-style-type: none"> Commodity Classification Spend Analysis 	<ul style="list-style-type: none"> Commodity Classification 	
Make	<ul style="list-style-type: none"> PAM 	<ul style="list-style-type: none"> PAM Mixture optimization (OR) 	<ul style="list-style-type: none"> PAM QLA 		
Deliver	<ul style="list-style-type: none"> Demand Forecasting Inventory Optimization Call Center Optimization 	<ul style="list-style-type: none"> Demand Forecasting Inventory Optimization Customer Intelligence 	<ul style="list-style-type: none"> Demand Forecasting Inventory Optimization Customer Intelligence 	<ul style="list-style-type: none"> Demand Forecasting Inventory Optimization 	<ul style="list-style-type: none"> Merchandise Planning Demand Forecasting Inventory Optimization Size Optimization Space Management
Technology	SAS Business Analytics Framework SAS Data Management				



Evolution of Information Capabilities



Organizations tend to follow a certain pattern regarding the use of information. Understanding this model helps the organization where it is in terms of capability and provides guidance on moving to subsequent levels. In many organizations, there will be groups that operate on different levels, although the overall rating of an organization defaults to the lowest common denominator.

It is important for the AICC to understand where its organization is placed with regard to information maturity to help the AICC find ways to best evolve to support the business.

LEANalytics

Analytical Intelligence Competency Center (AICC): *Functional Responsibilities*



- The functional areas represented here are used to stimulate discussion about what the AICC's responsibilities should be
- The AICC itself does not necessarily need to cover all areas (but the areas should be covered somewhere in the organization)
- It may make sense to leave some AI capabilities in the business units; however roles and responsibilities need to be clearly defined, and processes developed to ensure smooth collaboration and cooperation practices
- Once functional areas have been assigned, staffing can be determined

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5

HP – Business Analytics

THE ORGANIZATIONAL DIVIDE

Mar

More p
More S
More f

More i
More c
Happi

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IMPLEMENTING THE SOLUTION: COMPLEXITY ROI CALCULATORS

Identify and estimate
complexity cost impact
variety

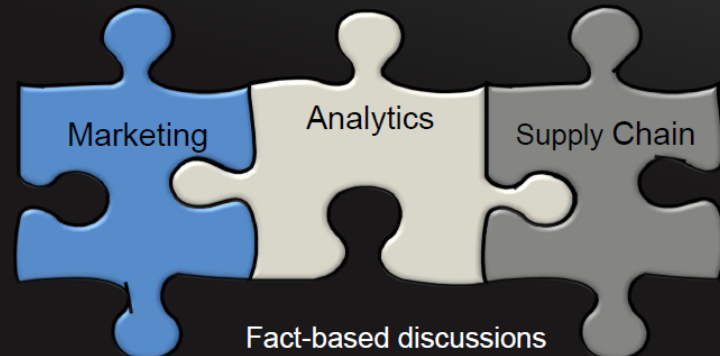
Codify relationships
complexity return on
investment (ROI) calculator

Screen new product
proposals using complexity
ROI calculator

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SUMMARY OF BUSINESS IMPACT

- Over \$500M in savings and \$180M in ongoing annual savings
- Significant order fulfillment improvements
- Thousands of SKUs eliminated



Fact-based discussions
Data-driven decisions

Our customers are the real winners!

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Advanced Analytics at Dow Chemical

- **Enhanced Sales Forecast**
 - 100% of the projects done using advanced analytics have shown significantly reduced forecasting error
- **Aggressive energy consumption reduction**
 - Dow has saved \$9 billion in energy cost since 1994
- **Early insight for business units**
 - By day 12 of every month, the BU's know if they will make targets and can adjust accordingly
- **Quick response to deteriorating economic conditions**
 - By using analytics, the Business Services Group retrieves critical information from the Internet and other sources and pushes this to the business on a daily basis
- **Deep insight into the role of exchange rates in margin contribution**
 - Dow developed a regional exchange rate risk model to help make decisions where raw materials are purchased, as well as pricing for finished goods

What is Enterprise Analytics?

- An analytics approach that functions at an Enterprise Level:
 - Part of the Organisational DNA
 - The Analytic Ecosystem
 - A journey not a project
 - Results Driven IT – Business Collaboration

Competitive Differentiation

Research shows that companies approaching analytics as an enterprise capability outperform their peers in the market [Davenport, McKinsey, Economist Intelligence Unit, etc.].



ALL IN A SINGLE, SEAMLESS FRAMEWORK



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