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Soft Systems Methodology in action: A case study at a purchasing department

Using SSM to suggest a new way of conducting financial reporting at a purchasing
department in the automotive industry

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Using Soft Systems Methodology at a purchasing department to conduct a study of financial reporting needs

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SUMMARY

The aim of this essay has been to try out Soft Systems Methodology on financial reporting at Volvo Cars Corporation (VCC). VCC saw a possible opportunity to improve their reporting processes, and SSM was chosen to deal with this possible problematic situation. Action Research became the natural way of conducting the study since it is almost a mandatory way of conducting SSM. A delimitation was made due to limited resources and only a small part of the purchasing department was involved, namely electrical purchasing. The result of the study is the artifacts from the different SSM steps that points upon how the participants would like the reporting system to be as well as many issues with the current reporting process. These outputs from the method were regarded as successful by both practitioner and participants. In essence the method was considered to be effective on a case such as this.

This report is written in English

Keywords: SSM, Soft Systems Methodology, VCC, Case, Financial, Report, Action Research, Volvo.

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1. Introduction

In this chapter a basic foundation will be laid for the reader to be able to better understand the background to this paper and why it was carried out with the current scope. It will also be a discussion about the main questions that this paper wishes to answer and a deeper analysis of the problem at hand.

1.2 Question at issue

How does Soft Systems Methodology, SSM, perform to deal with the task of suggesting a new way of conducting financial reporting within a purchasing department such as the one at Volvo Cars Corporation, VCC?

1.3 The background to this thesis

Before I began conducting my study had VCC already decided to evaluate and look at their financial reporting structures and processes during the spring of 2008, since some of the buyers had expressed that reporting work perhaps took up an unnecessary large amount of time and that the current reporting maybe did not add value to the company in correlation to how much time each buyer spent doing reporting work.

Another concern among the buyers was that three different reports were made to three different instances and no holistic efforts had been made to make this more efficient. A third concern was that there was no or little support for the user to make the necessary calculations within these reports. There was also no specific system for reporting, this work was solely done in spreadsheets with standardized templates that some users found hard to adapt to their reporting needs and demands. This is just the basic background that initiated the work before the study started and the reporting structures will of course be discussed in much more detail later on in this essay.

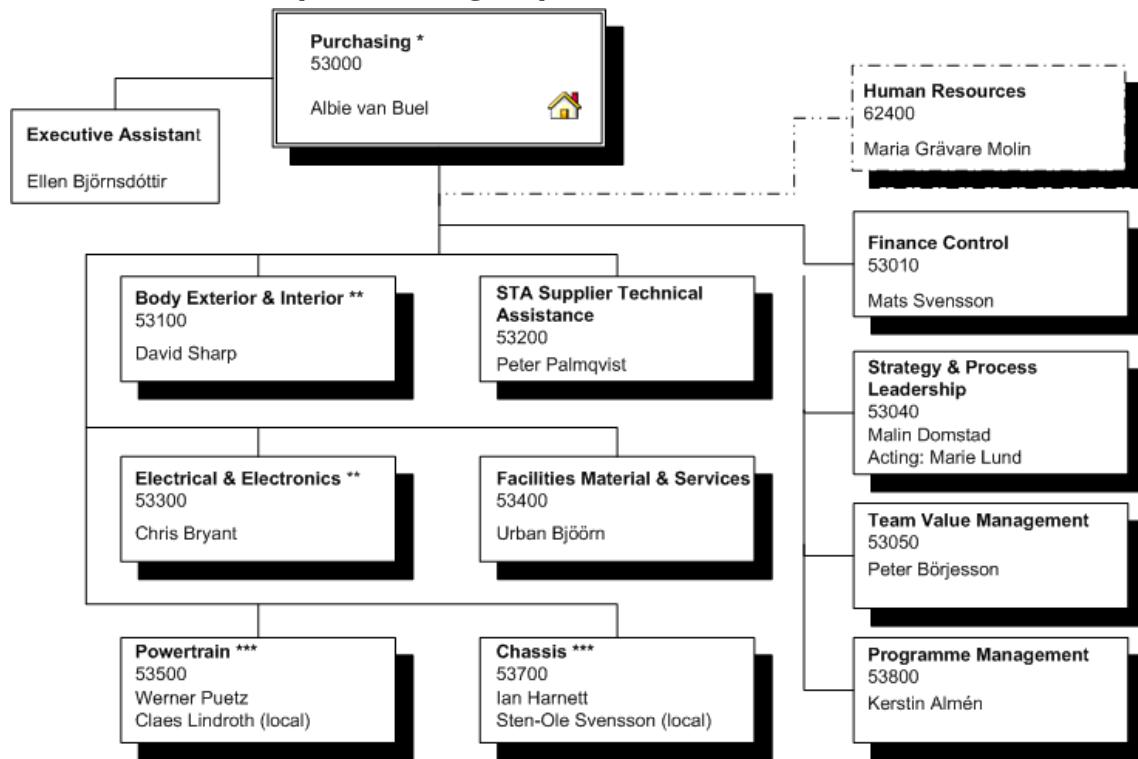
For me, the writer and student with a background in informatics and computer science with great interest in enterprise architecture and IT management this was a very intriguing problem and after looking into several different topics I found the use of Soft System Methodology, which will be referred to as SSM later in this essay, to be a suitable way of dealing with this matter.

VCC expressed a wish to be able to use this essay to get a "business case" and a "flying start" in their spring work of improving the reporting process. And if this paper could give a overview and analysis of the reporting process that's currently ongoing within the organization and also give recommendations of improvements and changes to the process, then that work would be helpful in the further work of improving the process during the spring and in the longer run add value to the company's way of conducting reporting.

1.4 Using SSM at VCC

There were mainly two reasons why I choose to apply SSM to the problem at hand. First there was the need to have a better understanding of the report structures that currently were active within the organization. Simply finding out about the reporting templates may not seem like a complicated task, however finding out how they are used by the different buyers and also how the receivers of the reports use the information provided, is a comprehensive task. One possible scenario could be that the buyers are formatting the numbers and performing calculations that suit the template of the report, but the receiver of that report might have to recalculate the numbers once again to extract the information necessary for her work, hence making a systematic error. Quite naturally there are many other implications that could arise, this is just an example of one possible scenario that points to the main question, why SSM? SSM is a well established academic method that emphasize on identifying the needs of all the key figures involved, the hope is that in this case it will be a suitable method to systematically find out what the current situation at VCC looks like. Not only will it identify how the process is ongoing today, but more importantly it will identify what the process should really look like to accommodate all the current needs. The second main reason was that upon identifying the current reporting process and what an ideal process should look like one can make recommendations about what IT systems will suit the current and future needs best. In my opinion SSM is a good way to address the issue at hand instead of trying to solve the issue just by coming up with a solution without investigating the problem and needs at hand thoroughly, as in many cases is the reality due to lack of time and resources etc. It is also important to mention that SSM is of course not the only method to address this task, one could for example also use Business Process Reengineering (BPR) or a software development oriented approach like the waterfall model or an iterative approach such as Agile, XP, SCRUM etc. All these methods are discussed further under the section of “Possible alternative methods of approaching the problem” and are just examples of possible and likely approaches.

1.5 How the VCC purchasing department works



- * Reports to: COO Chief Operating Officer and Executive Director
Purchasing Operations Europe
- ** Pan Brand Purchasing positions
- *** Pan Brand Purchasing positions CD based outside VCC

Figure 1 VCC purchasing department organization chart

The main function of the department is of course purchasing material that is used in the production plants in the production of Volvo cars. This can be a little more complicated than it may appear at first sight because the production plant does not assemble everything by themselves, for example a driver seat has many subcomponents to fulfill today's customer demands. For example the seats may have heating and different electrical motors for adjustment as well as a memory for remembering different driver seat adjustment profiles. The whole seat is bought as one component to be assembled with the rest of the car in the production plant. Of course this makes the production more efficient but can also complicate the purchasing process. One aspect is that VCC has less control of the quality standard of the whole seat if the supplier of the component has sub suppliers. Another aspect is estimating if VCC is paying the correct price for the assembled component since VCC does not know how much the supplier pays for the sub-components. In some cases VCC buys the sub components of the assembled component with instructions to the supplier's supplier to ship them directly to the supplier. This gives VCC the possibility to negotiate the price and quality of the subcomponents directly with the sub supplier. However not only production material is bought by the purchasing department, also non-production material must be bought to have a functional plant. This is basically everything that does not go into the car such as machinery, office supplies, buildings etc.

This is just a few examples of what can complicate the purchasing process, this can of course be analyzed in much further detail but that is outside the scope of this thesis. These examples are just meant to give the reader a brief understanding of how the organization functions and what its main business functions is within the VCC organizations as a whole.

1.6 Current financial reporting procedure

Perhaps the most common area is to apply SSM to a case where there is a feeling of “something should be done here” and there is no current IT/IS process to deal with the situation at hand¹. In this VCC case there are currently three main ways of conducting financial reporting that are separated from each other even though they all share a common tool for storing reports. In many ways they contain much of the same numbers and underlying data, but the data is presented and reported in different ways like SEK per car or percent.

1.6.1 The common purpose behind all three reports

The natural question to ask first is what all this reporting is all about?

The answer is that Ford Motor Company (hence refereed to simply as Ford or FMC) is the owner of Premier Automotive Group (PAG). The PAG group consisted of three brands Jaguar, Land Rover and Volvo Cars when this essay was written. However Jaguar and Land Rover was sold to Tata Motors before the essay was handed in.

For Ford to be a successful owner of this group of brands it needs to be cost effective. This can be done in many ways and one way is to reduce its costs for the material bought from suppliers. To be able to reduce these cost Ford needs to set out targets that should be accomplished by the different brands, for example Volvo needs to cut down its material costs by X% based on every car sold. To make sure this happens Volvo needs to take appropriate measures so management can have a good overview of this ongoing process and take appropriate measures when problems or potential problems occur. To accomplish this goal the target needs to be communicated all the way down through the organization so all data necessary can be gathered. This process is shown below in figure 2.

¹ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, pp xvi

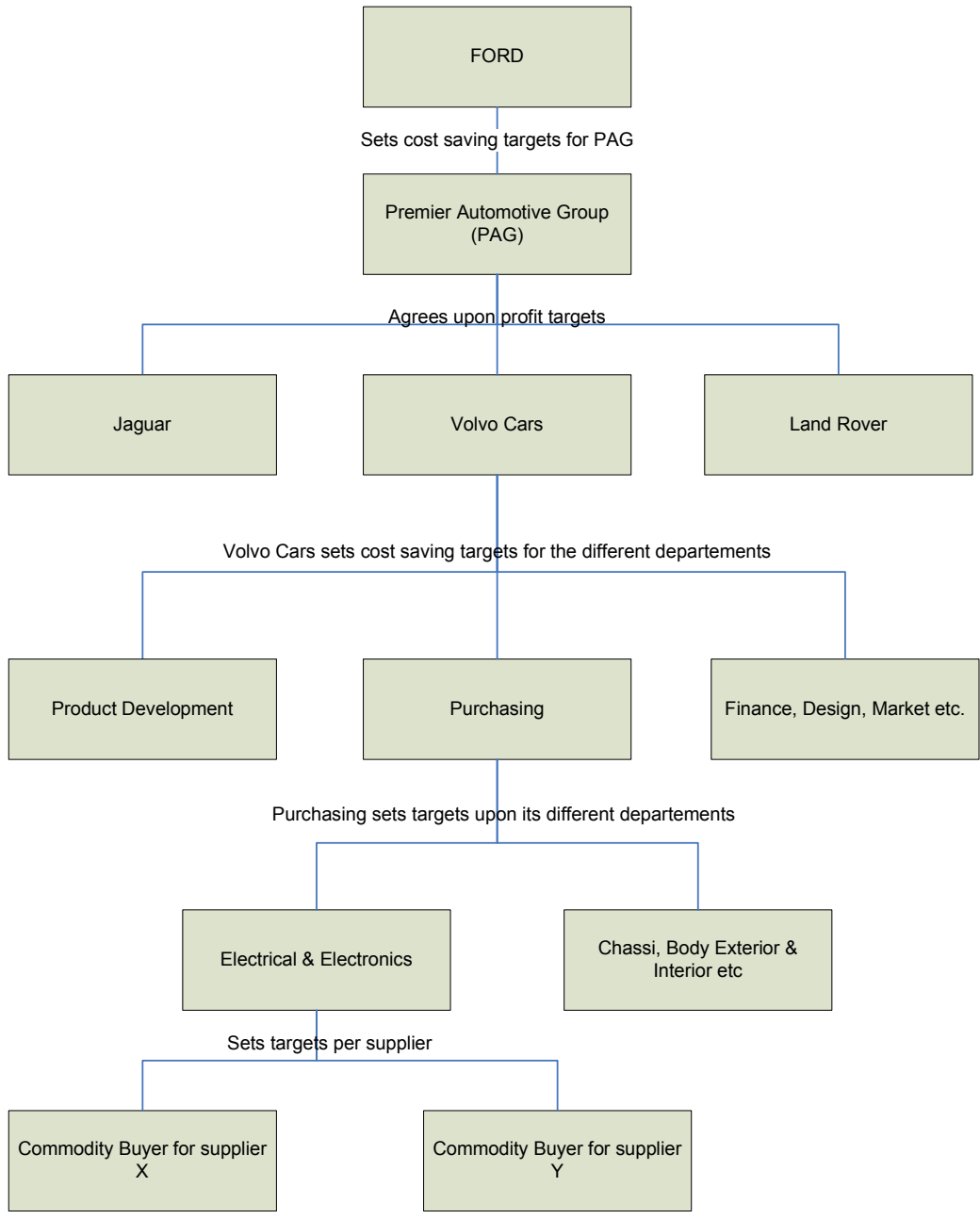


Figure 2 Cost saving targets breakdown

1.6.2 Business Plan

The purpose of the business plan is to produce an annual report for management to make sure they are aligned with the demands set upon them by their owner (Ford). The Business plan is owned by the purchasing organization at VCC.

In more detail what is presented in the business plan is turnover, project name, buyer, currency used etc. and this is presented for each section and supplier.

The Business plan summarizes all the data input and presents it in a “scorecard” way for relevant managers and shows the situation as it currently is. The Business Plan is created by every section in its own way and used as a working tool during the negotiation year. Hence this document can look different in every section of the purchasing department.

1.6.3 Commodity Business Plan

While the Business plan shows the current situation, the Commodity Business Plan, CBP, takes on a strategic angle and has a different owner called International Operations Synergies (IOS-Org). IOS-Org goal is to find synergy benefits amongst the different brands in the PAG group, for example if one brand purchases item X for price Y and at the same time another brand within the PAG group also purchases item X but for the prize Z, we can conclude that probably one brand is paying too much for item X.

The CBP is not only a purchasing tool; it’s a cross-functional tool which involves Product Development (PD), Purchasing, Marketing and sometimes also manufacturing. Purchasing is responsible for the commercial savings generated and reported in the plan, PD is responsible for the technical savings generated and reported in the plan.

Even though both the business plan and the CBP present turnover, project name and supplier for each brand, article and year it has a few differences in how it is presented. The CBP presents a 5 year period while the business plan shows the current year. In the CBP all costs are reported in USD (\$) while the business plan shows the currency in which VCC trades with each supplier.

1.6.4 GAP Event Template

Buying the items necessary to the right price can be a very complicated task. To be able to know what to pay VCC must know the material, production and transportation costs of the item. To get a better understanding of this, the purchasing department has to work together with the engineers at the product development department that has a better understanding of how the items are engineered, and thus can estimate what it takes to manufacture them and estimate the raw material costs involved. The cost for all the parts that makes up the item as well as all manufacturing costs involved in putting it together are presented in a document which the buyer can use as a basis when negotiating with the supplier. The product development department can also have suggestions regarding the production of the part, for example if we were to replace a part of an item with a similar part using a cheaper raw material that meets the quality standard, then the construction department should be rewarded for this finding. However all cases are not as obvious as this one and sometimes it can be very difficult to determine who should be rewarded for the cost saving. A simple example could be if we take the aforementioned example and a buyer negotiate a new price based on the production improvement suggested by the product development department, how much of that cost saving was due to the negotiating skills of the buyer and how much was the engineering cost savings?

To further complicate this issue VCC is conducting business on a market and thus have to take into account that supply and demand rules the way business is conducted. To be able to buy one part at the price suggested by VCC, we need to have a supplier that accepts to manufacture this part at the suggested price, VCC can't simply choose not to buy the part due to the economic impact a shortage of parts would have on the production of cars, VCC's product. Changing the supplier is of course an option but that involves quite a bit of administration and also the necessity to do what is called a "peep-up" which basically is a test to make sure the supplier can meet the quality standards and is capable of supplying the parts in the pace promised. Naturally this takes time and cost money and has to be taken into account before making a decision to change the supplier. On a more holistic perspective it is often a good idea not to have too many suppliers to administrate and the suppliers can also be more reluctant to give a volume discount if fewer parts are bought from them. These factors make the possibility of a gap between the price that VCC finds optimal and the price VCC is actually paying a reality. To make the gap as small as possible a gap event is conducted each year by TVM² where the parties involved are gathered to summarize the gap between the price that is being paid and the optimal benchmark price suggested by TVM. This event is called a "GAP event" and the conclusions are summarized in the report "Gap Event Template".

The owner of this report is TVM and basically this report work as a benchmark and reference with a more supporting function compared to the two previous mentioned reports the Business plan and the Commodity Business plan.

What the buyers need to report in this sheet is both the annual turnover in SEK for each item and the total gap between the price paid and the benchmark price, as well as the cost savings in percent with a horizon of 2 years.

1.6.5 PCR Report

Central Finance is responsible for the Product Cost Report (PCR) and its main purpose is cost control that eventually will be used by top level management. It is also used as a one factor when deciding the pricing of the final product, the car.

So this report has quite a different focus from the reports that are purchasing's responsibilities. While the BP and CBP measures cost savings in percent (%) the PCR measures the cost for each part in SEK per car. It's only the parts that have been affected by a price change that is included in the report. Some additional info is also provided for the parts in regards to the cost change for example the reason for the change in the cost of the item. The reason could be a quality improvement or that an investment was necessary to be able to produce the part cheaper. Since the PCR report has a heritage from the engineering system KDP, everything is also sorted according to function groups that consist of similar parts from an engineering standpoint.

1.6.5 Summary of differences and similarities between reports used by buyers

Presented in the chart below are the reports outlined in more detail above, summarized for a quick and easy overview. However a few other reports like the PCR and finance report do also affect the buyers but they do not work directly with them in the same way, and they are not owned by the buyers. Hence the decision was to focus on these three reports.

² TVM (Team Value Management) is the cost estimating department within VCC Product Purchasing

	Owner	Concerns	View	Contains
Business Plan	VCC Purchasing	VCC	Section & Supplier	Turn-over, project name, buyer
CBP	IOS-Org	PAG Group	Brand, article & year	Turn-over, project name, supplier, 5 year forecast savings
GAP Event Mall	TVM	VCC	Component	Gap between optimal & paid price
	Timeframe	Responsible	Purpose	
Business Plan	1 Year	Section managers (purchasing Dept.)	View present cost saving progress	
CBP	5 Years	Commodity directors	Strategic overview to locate possible savings	
GAP Event Mall	1 Year	TVM	Benchmark to measure price-paid and an attempt to find further savings by cross- functional working groups (Purchasing/PD-dept)	

Table 1 Overview of current reporting

2.0 Method

The method of choice will consist of both a theoretical and an empirical study that will be very closely linked together. This as SSM is a theory that is very focused on the practitioner of the method and how that person should be able to use the method to get the best possible focus on the problem at hand.

The more practical method to approach the problem will be both action research with some interviews but mostly workshops which will be covered in more detail below.

2.1 Literature studies

Quite naturally literature studies are a big part of the work. First of all it's necessary to read up on a few topics to get a good fit between the practical problems at hand, in this case at VCC, and academic theory on the topic and narrow down the possible interesting alternatives. Furthermore when the scope of the paper has been determined it's essential to get a good grip around the research area to get the best possible start with the task.

2.2 Interviews

In the beginning a few non-structured interviews were conducted to get a better understanding of how the users are using the current reports to conduct financial reporting combined with the methods of action research. The choice to make non-structured interviews is to be able to acquire the knowledge of how the reporting is conducted without making unnecessary assumptions. If I was to make a structured interview, chances are that I would make quite a lot of faulty assumptions about their work and hence that my questions would be more or less irrelevant.

With the new information and knowledge acquired from these interviews I gained a good basic knowledge of their view of the situation at hand thus being able to start organizing the upcoming workshops, allowing them to run more smoothly and not having to interrupt with questions of a basic nature.

2.3 Workshops

After completing a few interviews in the beginning to get a general grip and overview of the situation the research method changed into workshops. The reasons for having workshops were quite a few.

The first one was that is more or less suggested by the SSM literature, and for a good reason too. Since the study is performed at company where the employees take their time to participate in the study on top of their ordinary assignments and the practitioner have a limited amount of time at his disposal.

This calls for effective method where everyone can gather and effectively discuss matters, and also everyone can easily track the progress of the work by attending these meetings.

But perhaps the most important reason is to discuss matters in a group and therefore producing a much better output than one if everyone tried to contribute individually. Since SSM is an iterative methodology that by no means is a simple path towards the goal makes group discussions invaluable. In essence my opinion is that without workshops in groups it would be more or less impossible to reach the same result even considerable more resources and time on hand.

2.4 E-mail

Two questions for discussion were the buyers expressed their opinion about using SSM as methodology for dealing with the case was sent out and answered by e-mail. The reason for this was the simplicity and the short amount of time left which made it difficult to gather everyone in another workshop.

Another reason was that there could be an advantage in having the responses uninfluenced by each others opinions and therefore improves compare ability.

2.5 Action Research

Since SSM has its roots in action research this is a quite natural way and almost mandatory method of conducting this study³.

SSM is a very interactive approach to academic research in general and system development and therefore is a great way to conduct this study. Since the whole essence of action research is to contribute to the solution of humans practical problems in real world situations the connections between action research and SSM is quite natural, even though Peter Checkland, the founder of SSM would probably object somewhat to the language used since he doesn't like the words "solution" and "problem" when working with SSM. This is due to the fact that *problem* suggests that there is a clearly defined problem at hand, which there isn't and also that *solution* implies that SSM will fix the problem forever which is very wrong when referring to human systems and organizations. Further insight in this can be gained in the theory section.

³ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, pp. 17

3.0 Theory

3.1 Putting SSM in a context

To answer the question if SSM is a suitable way to deal with the VCC case it can be useful to put SSM in a broader context. Since most academic research and work is built upon knowledge and theories discovered earlier, it can be useful to get a basic knowledge of the origin of SSM as well. Since many methods and approaches to problem solving and system creation exist today, some other possible methods of dealing with the VCC case will be introduced to the reader below.

3.1.1 The origin of SSM – Systems Thinking

To get a broader understanding of the field some words will be mentioned about Systems thinking which is very closely linked to SSM. SSM is one application of systems thinking, but there are more:

Hard systems: Hard systems involve simulations often with computers and the technique of operations research⁴. A hard systems approach is very useful in dealing with problems that can be quantified but has great problems taking into account unquantifiable variables such as opinions, culture and politics and does not take into account that people can have rather complex motivation factors⁵.

Soft Systems: Soft systems were developed as a way of dealing with problems where the hard systems approach had difficulties, namely problems that cannot easily be quantified. Soft Systems is useful for understanding motivations, viewpoints and interactions and addressing both qualitative and quantitative dimensions of the situation⁶.

Evolutionary Systems: Evolutionary systems are a methodology applicable to the design of complex social systems. Critical systems inquiries are integrated with soft systems methodologies. Similar to dynamic systems evolutionary systems are understood as open, complex systems but with the capacity to evolve over time⁷.

Now that we have the overview laid out we can carry on with the overview of systems thinking. The foundation for systems thinking was laid in the field of systems dynamics by Professor Jay Forrester at the MIT in 1956.

Systems thinking were founded by Professor Jay Forrester at the MIT in 1956. Forrester recognized the need for a better way of testing new ideas about social systems and use the same way as engineering systems are tested. To solve this, systems thinking lets people make their understanding of social systems explicit and improve them in the same way as engineering principles are made explicit to improve the understanding of mechanical systems.

⁴ <http://www.business.mmu.ac.uk/mascla/resources/systemsthinking.php>

⁵ <http://www.business.mmu.ac.uk/mascla/resources/systemsthinking.php>

⁶ <http://www.business.mmu.ac.uk/mascla/resources/approaches.php>

⁷ <http://www.iss.org/primer/evolve2.htm>

What separates systems thinking from traditional forms of analysis is that traditional forms are separating the individual pieces that are studied while systems thinking in contrast focus on how the pieces studied interact with the other constituents of the system. So instead of isolating smaller and smaller parts of the system, systems thinking expand its view to take into account larger and larger numbers of interactions. The result is often very different compared to traditional forms of analysis, especially when studying dynamically complex issues or when what is studied involves much feedback from internal and external sources. The greatest benefit often comes when studying the most difficult problems. Some examples where systems thinking have been proved useful are:

"- Complex problems that involve helping many actors to see the "big picture" and not just their part of it

- Recurring problems or those that have been made worse by past attempts to fix them

- Issues where an action affects (or is affected by) the environment surrounding the issue, either the natural environment or the competitive environment

- Problems whose solutions are not obvious"

3.1.2 Possible alternative methods of approaching the problem

One possible way of approaching this problem is to focus directly on the software development of a possible new system. When making such an approach a method directed towards software development could be used, such as;

Waterfall

The waterfall method is a sequential software development method where the development looks like a waterfall in the sense that it is floating downwards when going through the different phases of requirements analysis, design, implementation, testing (validation), integration, and maintenance.

When using the waterfall model one proceeds from the first phase to the next and so forth in a purely sequential manner, so when for example the requirement specifications are set, it is irreversible. When this step is completed one proceeds to design the software to be used by the software developers (coders) to use as a blueprint and implement the requirements given⁸. In the later stages of the implementation phase the different team's disparate software components are integrated. When this is completed the software product is tested and debugged and the faults from previous phases are removed. Then when all faults are removed the software gets rolled out, installed and maintained over time in the final phase⁹.

In the 1970-ies Winston W. Royce introduced the waterfall model as an initial concept, or what is currently referred to as the waterfall model even thou Royce himself did not use the term. Somewhat ironically this model was presented as a flawed initial model that could be developed into an iterative model with feedback from each phase¹⁰. Instead of the final iterative model, the initial model got the most attention and is referred to as the waterfall model.

⁸ <http://www.cs.umd.edu/class/spring2003/cmsc838p/Process/waterfall.pdf>, p 329

⁹ Ibid

¹⁰ <http://www.cs.umd.edu/class/spring2003/cmsc838p/Process/waterfall.pdf>, pp 329-330

The waterfall model is quite widely used, for example by software development houses employed by U.S. Department of defense and NASA¹¹. However there are various modified waterfall models, so it may be noted that it possibly isn't the "pure" original model that is being used in these cases.

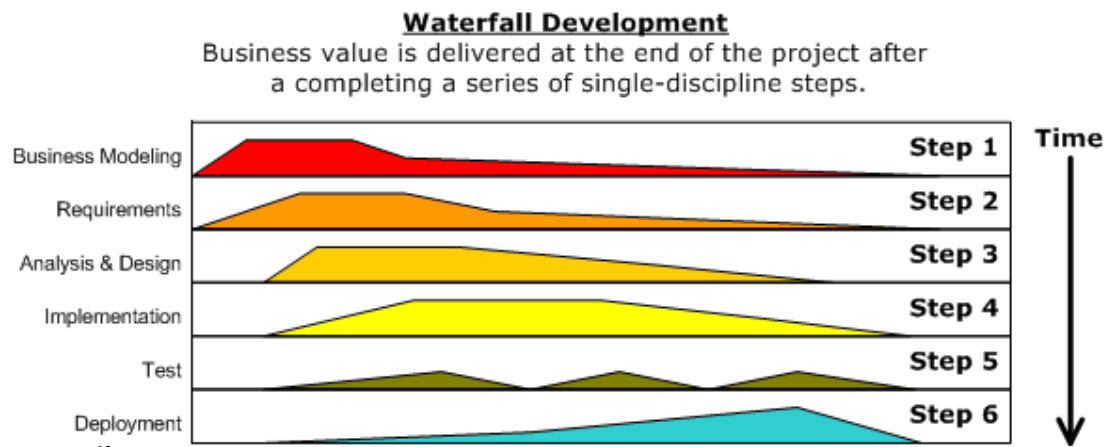


Figure 3¹² Waterfall development

Iterative and incremental development methods

The iterative and incremental system development method is a cyclical process contrary to the waterfall model. In RUP¹³, Extreme programming (XP)¹⁴, Dynamic Systems Development Method¹⁵ and Agile¹⁶ this is an essential part.

Starting off with *incremental development*¹⁷, a scheduling and staging strategy where the various parts of the system are developed at different times and rates and then integrated with each other as they are completed. Incremental development does not require or preclude iterative development or waterfall development¹⁸.

Iterative development is a rework scheduling strategy where time is set aside to revise and improve parts of the system if necessary. It does not require or presuppose incremental development but has proven to work well together with it. So the distinction is that an output from an increment does not necessarily have to be subject to further refinement and the feedback from users testing it is not used as input for the upcoming increments, whereas the output from an iteration is examined for possible further refinement and especially as input to revise targets of the successive iterations¹⁹.

¹¹ http://web.archive.org/web/20050310133243/http://asd-www.larc.nasa.gov/barkstrom/public/The_Standard_Waterfall_Model_For_Systems_Development.htm

¹² http://en.wikipedia.org/wiki/Iterative_and_incremental_development

¹³ <http://www-306.ibm.com/software/awdtools/rup/>

¹⁴ <http://www.xprogramming.com/xpmag/whatisxp.htm>

¹⁵ http://www.ifi.unizh.ch/req/courses/seminar_ws03/14_Voigt_DSMD_Ausarbeitung.pdf, pp3

¹⁶ <http://agilemanifesto.org/>

¹⁷ http://alistair.cockburn.us/index.php/Incremental_versus_iterative_development

¹⁸ Ibid

¹⁹ Ibid

The basic idea behind iterative enhancement is to develop incrementally to take advantage of the learning experiences from earlier deliverable increments of the system, both from development and use. Basically the key steps are to start with a simple implementation of a subset of the software requirements and then to enhance the evolving sequence of versions iteratively until one has a full system implemented²⁰.

This procedure consists of the initialization step, iteration step and the project control list²¹. The first initialization step creates a base version of the system to be used as a product for the user to react to. A sampling of key aspects of the problem should be offered as well as a solution simple enough to understand and implement easily. To guide the iteration process a control list is established with a list of tasks that needs to be performed. This can be new features to be implemented and areas that have to be redesigned. Since the method is iterative the goal of the design and implementation is to be straightforward and keep it simple as well as modular to support redesign or add the change to the project control list²². The interactive approach does not dictate any amount of design detail. In a light-weight iterative project the code might be the biggest source of documentation whereas in a huge mission critical project a formal software design document can be used. User feedback is used in the analysis after an iteration is completed together with the program analysis facilities available. Structure, modularity, usability, reliability, efficiency and achievement of goals are analyzed and then the project control list is modified accordingly²³.

Iterative Development

Business value is delivered incrementally in time-boxed cross-discipline iterations.

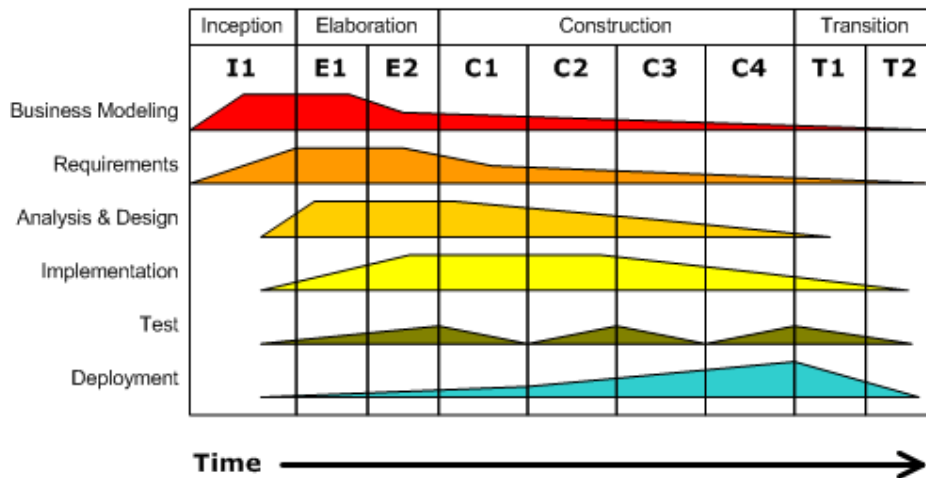


Figure 4²⁴ Iterative development

Business Process Reengineering

Another approach to this problem could be to change the focus from software development to changing the business processes. Business process reengineering (BPR) is outlined in a few phases below:

²⁰ http://alastair.cockburn.us/index.php/Incremental_vs_iterative_development

²¹ <http://www.ece.uidaho.edu/ee/classes/ECE340/notes/Chapter2.pdf>, p 1

²² <http://www.ece.uidaho.edu/ee/classes/ECE340/notes/Chapter2.pdf>, pp 1-2

²³ <http://www.ece.uidaho.edu/ee/classes/ECE340/notes/Chapter2.pdf>, p2

²⁴ http://en.wikipedia.org/wiki/Iterative_and_incremental_development

Assess Business Strategy

BPR claims to align organizational change including IT development with business strategy because BPR concentrate in improving processes which are of primary strategic importance. Furthermore BPR distinct itself from strategic planning and assumes the strategy is already determined as well as having an external focus towards customers, products, suppliers and markets²⁵.

Select Processes

The first step in choosing the processes which one will concentrate ones engineering efforts upon is to identify the major processes. A process is "an interrelated series of activities which produce business outputs" and could be just one activity but usually are more and must make sense to an outside observer²⁶. Processes are also classified to what extent they are value-adding and have a strategic impact.

Determine process boundaries

Some processes can be quite obvious such as product manufacturing while one can discuss whether materials procurement should be included in the same process. For processes which follow each other such as marketing and sales it can be difficult to determine the boundaries and most difficult is often processes which intervene and share "multi-purpose" activities. They often prove to be difficult to deal with in an organization design. In such a case it can be a good idea to pick the process regarded as most important to start off with. It is also a general guideline to start with "obvious" processes²⁷.

Asses Strategic Relevance

Reengineering usually concentrates on a small number of processes. They should be complete and not part of any other processes. If the reengineering is thorough, it will probably cause a flow-on effect identifying unsatisfactory neighboring processes that will be candidates for redesign²⁸.

Those processes that are most critical to the organization's strategy should be dealt with first as a general guideline²⁹.

Judge Health and Qualify Culture and Politics

To judge the complete health of processes of course takes detailed modeling, but processes with obvious problems such as customer complaints are candidates for reengineering. It is also important to asses the culture and politics within the process and also how it is viewed from a wider organizational standpoint. This is important to know, since successful reengineering ultimately depends on the cooperation of the people performing the process that are being dealt with, so it is better to deal with processes where one has a favorable cultural and political environment³⁰.

²⁵ <http://www-staff.it.uts.edu.au/~jim/bpt/bpr.html>

²⁶ Ibid

²⁷ Ibid

²⁸ Ibid

²⁹ Ibid

³⁰ Ibid

Creating a Process Vision

Creating the vision is the most critical stage in BPR and also the least structured³¹. Guidelines and methodologies can help us with design and implementation but in creating a vision we are more or less on our own, even though there are techniques such as brainstorming available. There are two aspects of vision creation: the search for a vision and vision characteristics.

In the vision search we have to attach the vision to the strategy and therefore a good starting point for inspiration is the organization's strategy providing the strategy is sufficiently specific to provide a good foundation for a sense of direction³². It is also important to keep the vision at an appropriate level, broad but specific.

Customer input is important to the vision since BPR supports a customer focused strategy. It can also be useful to see how other people do what we are trying to achieve. To get ideas we can look for benchmarks in quite different types of organizations. This can in some cases be easier since direct competitors might not be willing to reveal their "best" practice.

The process vision shall show us what we want our new processes to do and to some extent how it will be performed, these are the objects and attributes of our vision³³.

The requirement is that the objectives have to be measurable with a clear customer focus as well as being simple and non-contradictory.

The attributes should indicate how we intend to achieve the objectives in general principles and from a technological standpoint, of course depending on the situations we find ourselves in³⁴.

Furthermore it is emphasized that radical change is only achieved by setting ambitious objectives.

Understand and Improve Existing Processes

It is advised to study the current processes due to the following reasons³⁵:

- *"People in the organization (and customers) will use language based on the existing processes. We need to use this language to explain our proposals.*
- *When implementing the new processes we will have to plan change from the current situation - the existing processes.*
- *The existing processes may be causing problems which we could easily repeat if we do not understand them. Existing processes may also contain activities to avoid problems which we might not anticipate.*
- *The existing processes are the base from which we measure improvement. "*

³¹ <http://www-staff.it.uts.edu.au/~jim/bpt/bpr.html>

³² Ibid

³³ Ibid

³⁴ Ibid

³⁵ Ibid

This includes the following activities³⁶:

- *"The current process flow is described using any suitable diagramming method. Such a method should indicate the sequence of activities, trigger events, time taken for each activity and any buffering delays.*
- *The current process is evaluated against the **new** objectives and assessed for conformance to the new attributes.*
- *Problems with the current process are identified. It is important to remember that reengineering does not simply mean to rationalize existing processes.*
- *Short term improvements to the current processes are proposed. It is not advisable to postpone simple improvements until complete reengineering is done."*

Asses Social and Technical Resources

This is the step where we decide if we have the required resources available to proceed with the project. Social resources refer to the people in the organization and the organization itself. Is teamwork a tradition? Is the organization used to changes? What skills do we have available etc.?

The next step is to decide weather our findings are adequate or if the social resources have to be developed before or during the project. The same procedure has to be done with the technical resources, which often are easier to judge. Do we have the appropriate technology such as hardware, software and skilled people? If not, we have to develop this, but contrary to social resources, technical resources can be gained through outsourcing³⁷.

Design and Implement New Processes

Different methodologies can be used for implementation and design of the new processes but a number of points outlined below are important to keep in mind³⁸:

- *"Since BPR is performance oriented, the methodology must be able to predict performance during design.*
- *BPR projects are meant to be done quickly - the methodology should support this.*
- *Stakeholders (both customers and those who will be operating the process) must be involved.*
- *We are looking for radical design as well as radical vision so there will be more brainstorming.*
- *For any design proposal we must be able to assess feasibility, risk and benefit.*
- *It would be difficult to achieve the previous objectives unless the methodology was strongly based on prototyping."*

³⁶ <http://www-staff.it.uts.edu.au/~jim/bpt/bpr.html>

³⁷ Ibid

³⁸ Ibid

3.2 What is SSM all about?

John Poulter and Peter Checkland presently define the aim of the work that led to the development of SSM was to handle very common situations in everyday life where there is a feeling that “something needs to be done about this”. These situations should be referred to as “problematical” rather than “problem situations”. This is due to the fact that in a problem situations we have a clearly defined problem that needs to be solved whereas in a problematical situation we do not³⁹.

One example is a government trying to define a legislation to increase the feeling of security on the street for its citizens in a time of terrorist threats without diminishing civil liberties. Both these are examples of “problematical situations” which could be solved either by just randomly thrashing about, emotionally, intuitively, and based on previous experience or by using SSM.

3.2.1 Acting upon problematic situations

When we interact upon real world situations we make judgments upon what happens. This could be “good/bad”, “acceptable/unacceptable”, “permanent/transient”. To make these judgments we have different criteria which we match the situation against to make a judgment⁴⁰. These criteria can be very different from person to person. For example an environmentalist could judge a decision to act upon a situation “good” if it is an environmentally friendly decision. The same situation could be seen as “bad” from a capitalist’s standpoint because the decision would not be profitable from an economic point of view. The resulting question is why do we have these different standpoints regarding criteria? One reason is our DNA, our genetic inheritance passed on to us from our parents, but of course mostly it depends on our experiences from the world so far. These criteria and the results they produce builds up to a personal worldview over time. These worldviews causes one person to be “liberal” while another one could be “conservative”. These etiquettes we put on other peoples world views can be very different depending on who you ask, one person might for example see Che Guevara⁴¹ as a freedom fighter while someone else sees him as a terrorist. These worldviews can also change over time, for example an emotionally cold person could be more compassionate after experiencing love⁴².

³⁹ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 3

⁴⁰ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, pp. 5-6

⁴¹ http://en.wikipedia.org/wiki/Che_Guevara

⁴² Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 6

3.2.2 Flexibilities importance to SSM

Since the situations we have discussed above change over time, we will need a flexible approach to deal with them. Every situation involving humans is unique, even if two situations are very similar nothing ever happens exactly in the same way!

If they were, the optimal way would probably be to hand over the situation to a computer to calculate the optimal solution.

To meet these types of situations we will need to use a methodology rather than a method. What defines a methodology is that it is a set of principles that can be adapted to be used in a way that suits the nature of the current situations in the best way⁴³. One could almost see it as a carpenter's toolbox with different tools that can be used in different ways to build different things.

3.3 System thinking

The system ideas of parts that interact with each other to make up a whole can be very useful since it's quite similar to situations in the real world, where interactions between different elements makes up the situations humans are facing⁴⁴.

Examples are often of great help in trying to understand different ideas. In trying to describe systems thinking it's important to have the knowledge that a system is only as good as its parts. For example a bicycle can be seen as a system and a bicycle is only as good as the parts it is made of, for example if the bicycle is missing a tire it will have a great impact for the user trying to handle the bike.

Another example can be the braking system of a car. If we were to improve the braking abilities of the car by only looking into great detail of the break pads such as size, material composition etc, we would miss out many things which affect the system which in turn affects how fast the car will stop. If we expand our boundaries and start looking at breaking as a system it will be one with the interaction between break discs/drums, break pedal sensors, hydraulics, tires, driver reaction time, road conditions, weather conditions and possibly even more⁴⁵.

The core system concept is that an adaptive whole (system) can survive throughout time by adapting to the changing surrounding environment. To make this possible the system needs to have communication and control processes. The system may also contain sub systems or may be seen as a subsystem in an even bigger system in the eyes of a different observer⁴⁶. This is why a layered structure is fundamental in system thinking. A system also needs to have what is called "emergent properties" which is the properties the system has as a single whole⁴⁷. We can once again reflect upon the example above with the bicycle, it's not a fully functioning bike without a tire. Only with all the parts of the bike assembled correctly it has the emergent properties of being a fully functioning vehicle. This makes the concept of a vehicle meaningful only in relation to the "whole".

⁴³ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 6

⁴⁴ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 7

⁴⁵ http://en.wikipedia.org/wiki/Systems_thinking

⁴⁶ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 8

⁴⁷ Ibid

In summary we now have four core concepts of systems thinking⁴⁸;

- Communication processes
- Control processes
- A layered structure
- Emergent properties

This kind of thinking is very important to SSM due to the finding that it doesn't matter if we are investigating a small family company or a multinational company with hundreds of thousands of employees. No matter the type of company it contains people, who are trying to act purposeful in the different situations that appears, contrary to just act instinctively⁴⁹. This is the key finding that makes it meaningful to treat the purposeful action as a system, or as Checkland puts it⁵⁰:

“A logically linked set of activities constitute a whole – its emergent properties being its purposefulness”

When making system models it is very important to be aware that they are always constructed from a world view, they all express one way of looking and/or thinking about a specific situation, and there will always be multiple possibilities here⁵¹.

If we were to look at the examination seminar for this paper, there would be different views of the author, that is to say me, trying to defend my work. The opponents, examiner, audience, and the school board will obviously observe me from different angles according to their world view.

We could find an even bigger difference if we were hired by FIFA to propose the future of the world cup in soccer, and studied the world views of the nations, TV viewers, coaches, audience, media companies, athletes, snacks and food salesmen etc.

If there are so many world views, what is the point in making one, since it obviously will not include everybody? If we make one up, we will miss out on a lot of worldviews that might be very important?

The answer is that these models should be seen as intellectual devices used as a basis to ask questions about the real situation and thus exploring that situation⁵². One such question could be how the activity in the real world differs from the modeled one, and if we would like the real world to be more like the one in the model or vice versa. This type of questions is an incubator for further structured questions and discussions about the real situation and thus surfacing different worldviews and in extension trying to improve the situation at hand for the better. This discussion will be helpful in finding a version of the situation that people with different worldviews can all live with⁵³. This situation must meet two criteria⁵⁴:

1. It has to be arguably desirable given the outcome of the models used

⁴⁸ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, pp. 7-8

⁴⁹ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 9

⁵⁰ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 10

⁵¹ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, pp. 10-11

⁵² Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 11

⁵³ Ibid

⁵⁴ Ibid

2. It must be culturally feasible with the unique situation, unique people, unique history and unique narrative that the participant has constructed over time to make use of their experiences.

3.4 The SSM process

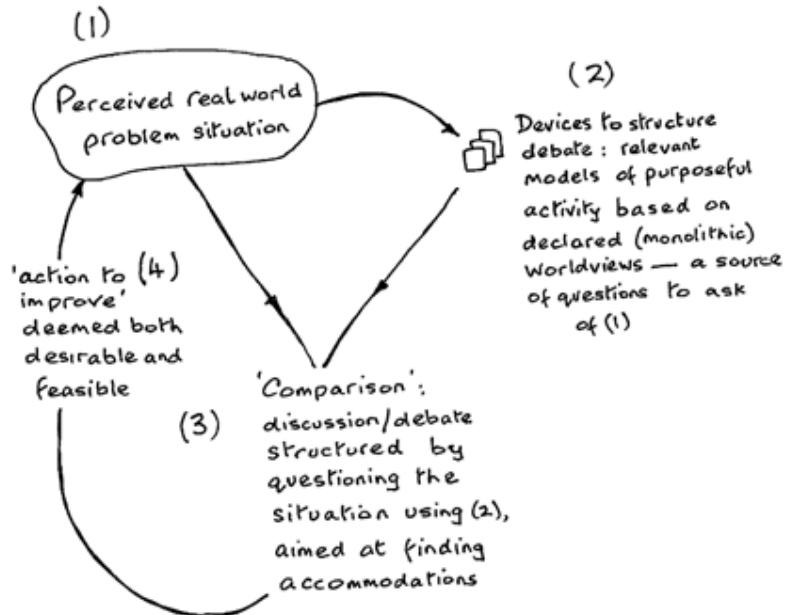


Figure 5⁵⁵ SSM process

The SSM process contains four different kinds of activity, or more specific, the SSM cycle⁵⁶:

“

1. Finding out about the initial situation which is seen as problematical.
2. Making some purposeful activity models judged to be relevant to the situation; each model, as an intellectual device, being built on the basis of a particular worldview.
3. Using the models to question the real situation. This brings structure to a discussion about the situation, the aim of the discussion being to find changes which are both arguably desirable and also culturally feasible in this particular situation.
4. Define/take the action to improve the situation. Since the learning cycle is in principle never-ending, it is an arbitrary distinction as to whether the end of a study is taken to be defining the action or actually carrying it out. Some studies will be ended after defining the action, some after implementing it.

“

It's important to emphasize that this is not a step by step process where you never have to go back to the previous steps when once completed, but a cyclic process which contains four different kinds of activities⁵⁷. This goes hand in hand with the core of SSM that its important to find out and surface as much information as possible to be able make informed judgments and decisions.

⁵⁵ http://www.palgrave-journals.com/jors/journal/v57/n12/fig_tab/2602118f1.html

⁵⁶ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 13

⁵⁷ http://www.palgrave-journals.com/jors/journal/v57/n12/fig_tab/2602118f1.html

3.5 Rich Pictures

To be able to make rich pictures that work towards an improved problematic situation the practitioner has to have a particular mindset. She needs both to be able to soak up as much information as possible from the situation interviewee but at the same time also have a mindset of “prompts” to ensure that a wide range of aspects are looked at and considered⁵⁸. Checkland recommends two questions as a good start to work with⁵⁹:

*”- What resources are deployed in what operational processes under what planning procedures within what structures, in what environments and wider systems, by whom?
- How is resource deployment monitored and controlled? ”*

If the practitioner can answer these two questions, she has come along way in the process but they are not any formal part of SSM, simply just questions that are helpful to ask oneself to get started⁶⁰. These questions were dropped as a formal part after the phrase "rich picture" became a real picture instead of prose, the old saying that a picture says more than thousand words is very much true in this case. So what really is this rich picture? Checkland describes it as⁶¹:

"In making a Rich Picture the aim is to capture informally, the main entities, structures and viewpoints in the situation, the processes going on, the current recognized issues and any potential ones."

Further Checkland emphasizes that it's important to remember that however rich the picture is, it could be richer and that rich pictures are snapshots of a situation that will not remain static for very long. Wise practitioners use rich pictures as a way of capturing impressions and insights continually as an aid to thinking⁶².

⁵⁸ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 24

⁵⁹ Ibid

⁶⁰ Ibid

⁶¹ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 25

⁶² Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 27

3.6 Analysis 1 – The intervention

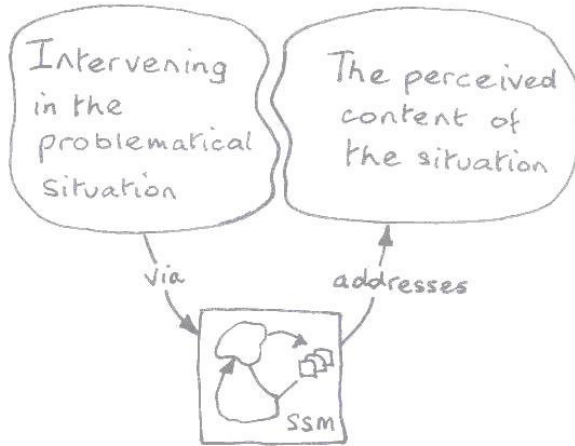


Figure 6⁶³ Intervention

As figure 6 shows above, three elements are brought together, the methodology itself, the use of the methodology and the practitioner that organizes the task of intervening in the situation at hand. Checkland recommends thinking about the figure mentioned in a particular way because he found out during his development of SSM that three key roles were always present⁶⁴:

1. *There was some person (or group of persons) who had **caused the intervention to happen**, someone without whom there would not be an investigation at all – this was the role "client".*
2. *There was some person (or group of persons) who were **conducting the investigation** – this was the role "practitioner"*
3. *Most importantly, whoever was in the practitioner role could choose, and list, a number of people who could be regarded as being **concerned about or affected by the situation and the outcome** of the effort to improve it – this was the role "owner of the issue(s) addressed"*

Furthermore Checkland emphasizes the use of "roles" rather than naming particular people. This is because a person can have more than one role and people can also change or abandon roles⁶⁵. An example of this is if the founder of the intervention were to carry out the study herself she would be both a client and the practitioner. She could also be affected by the system and then also appear in the list of issue owners who cares about the outcome of the system.

⁶³ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 27

⁶⁴ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 28

⁶⁵ Ibid

Another important part of the intervention is to make sure the appropriate resources are in line with the ambition of the investigation, or as Checkland puts it⁶⁶:

"Don't undertake a study of "the future of the A-level examination in British education" if you have only got one man and a boy to work on it between now and Thursday."

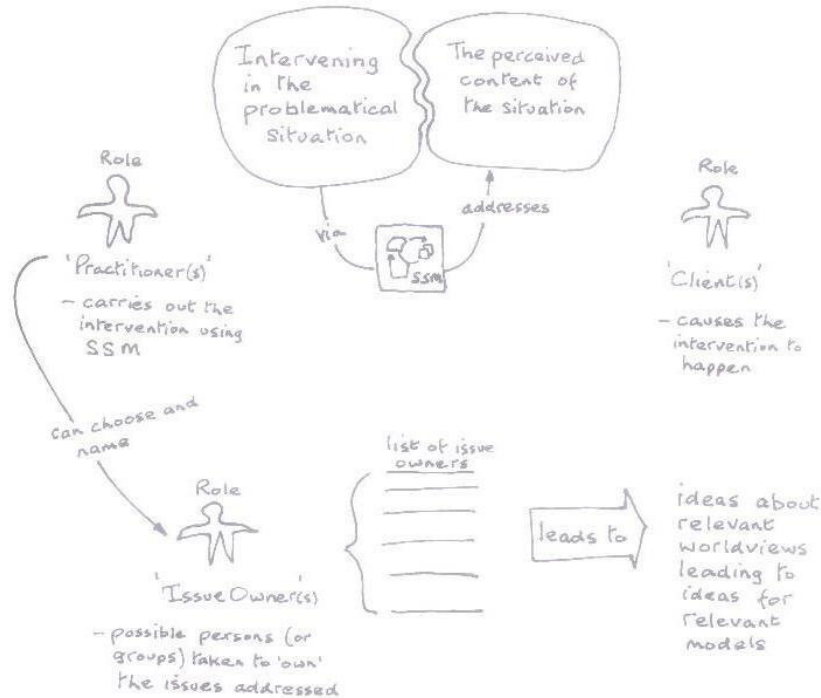


Figure 7⁶⁷ Intervention with SSM

So "Analysis 1" is basically about thinking of the situation (figure6) in the way shown above in figure 7⁶⁸.

"Who are in the roles "client" and "practitioner"? And who could usefully be included in the list of "issue owner"?"

Checkland also points out that it's always useful to think about clients aspirations for the intervention. This aspiration is always to be taken seriously but it's also important not to let it be the sole purpose of the work. This concludes that the person(s) in the client role should be in the list of possible "issue owner" but never be the only one in that list⁶⁹.

Another important part of understanding SSM is that it can be applied both to grappling with the content of the situation as well as deciding how to carry it out⁷⁰. These two approaches are known as "SSM (c)" and "SSM (p)" (c for content and p for process). SSM (p) often leads to the making of the first models in an intervention being modeled related to doing the study.

⁶⁶ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 28

⁶⁷ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 29

⁶⁸ Ibid

⁶⁹ Ibid

⁷⁰ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 30

3.7 Analysis 2 – Social

A basic condition for changing a human situation is to have a clear idea about what you are intervening in and have some sense of the "social reality" in this situation⁷¹. Because SSM is an action-oriented approach where we learn our way to practical action makes it important that the improvements we are suggesting are not only desirable but also culturally feasible⁷². We have to understand the culture of the individual persons within the group of people we are working with as well as the whole group's worldview and its particular history and ways of looking at the world⁷³.

If there was an agreed definition of "culture" this would be easy, however there is not, even though it has been discussed greatly among anthropologists, sociologists and writers of management literature.

However most of us have a "feeling" and "flavor" of the social texture we are acting within. Checkland defines these three main components in the following way⁷⁴:

Roles: Roles are social positions which mark out differences within different groups such as organizations and companies. These can be both formal like CEO, department heads and sections heads but also local informal roles like a "boat-rocker" who speaks his mind without further ado. The importance of these informal roles is not to be taken lightly, they can tell a lot about the given culture.

Norms: Norms are expected behaviors that are associated with a role and help to define it. For example if you were to meet the headmaster in a school and she was laid-back in her chair in her office with her feet up on her table while picking her teeth, most people would probably consider that to be outside the norms of a headmaster

Values: Values are the criteria by which behavior-in-role get judged. There is often no shortage of people discussing other people's behavior in their role within organizations. Like in the example above with the headmaster one opinion might be "she's a lazy and irresponsible headmaster".

With this explanation we can conclude that all three elements are linked together and also that they are not static, instead very much changeable as time passes by and the world moves on. Anyone who has changed her role within a company or organization knows that it changes them and they adopt a new perspective appropriate to the role. This also applies to bigger changes in world, the norms of today has changed a lot, if you compare to what was expected of a certain role fifty years ago compared to today⁷⁵.

⁷¹ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 31

⁷² Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 32

⁷³ Ibid

⁷⁴ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 33-34

⁷⁵ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 34

What should practically be done to address this according to SSM is to ask oneself (the practitioner) after an interaction (meeting, interviewing, informal meeting) what you have learned about roles, norms and values and store this in a file along with a date on each entry. Then it's possible to go back and reflect upon one's learning⁷⁶.

3.8 Analysis 3 - Political

The focus of this section is to find out the disposition of power in a situation and the processes for containing it. This is important to know to determine what is "culturally feasible" in the study.

The political science literature has many complex models to express the nature of politics but Checkland goes directly to the founding father Aristotle and simply explains his way of looking at politics⁷⁷. The basic outline of this theory is that a society will fall apart (in his case the Greek city-state) if there is no accommodation for the interests of people living together. These interests will never go away and unaccommodated they will cause destructive factions. The political analysis deals with this issue through the metaphor of "commodity" which embodies power. This puts the following question to mind⁷⁸:

"What are the processes, by which these commodities are obtained, used, protected, defended, passed on, relinquished, etc?"

To capture the answer to these questions Checkland proposes the same approach as in analysis 2⁷⁹.

3.9 Making activity models

A very important part of SSM is the making of models of purposeful activity and using them as a base for asking questions about the real-world since every human situation reveals people trying to act purposefully. Since every model is based on a specific worldview they can never be descriptions of the real world, they simply model one way of looking at complex reality. Hence the base of their existence is to work as devices to make sure that the learning process is organized⁸⁰.

To construct this model of a purposeful "activity system" viewed through the perspective of a pure declared worldview which is relevant to the study we need a statement describing the activity system to be modeled. The descriptions are referred to as Root Definitions (RD) in SSM⁸¹. To untangle this metaphor root conveys that this is one core way of describing the system. To further unravel this subject, an example of this is the following:

"A system to mowe your lawn". We can quickly notice that this description is not very clear and could be interpreted in quite a few ways, so the outcome when used as a basis for asking questions would most likely be richer with a more detailed description, something like "A

⁷⁶ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 34-35

⁷⁷ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, pp. 35-36

⁷⁸ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 36

⁷⁹ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 38

⁸⁰ Ibid

⁸¹ Ibid

household-owned and staffed system to mowe the lawn with a hand driven lawnmower to tidy up the garden and thus enhance the appearance of the property as a whole".

With this more detailed description there is no question about whose worldview is given (householders). There is also a do it yourself (DIY) approach to mowe the lawn. So we have the answers to three quick questions:

How – By a hand driven lawnmower

What – Mowe the lawn with hand driven lawnmower

Why – To enhance the appearance of the property

To help this modeling process Checkland has five steps⁸²:

1. The formula above with the three questions can be used in every RD ever made. This is known as "the PQR formula" in SSM, do P (how?), by Q (what?) in order to achieve R (why?). When the PQR formula is complete we will have the transforming process completed in Q.

2. Now, from step number one we have the ability to write out the RD as a statement. This statement always describes the purposeful activity as a transformation process; where in the example above the "un-mowed" lawn becomes "mowed". The beauty of this is that any activity you can think of can be expressed in this way which makes this a very straightforward process. When the RD is complete it is possible to move on to put the activities together to form a model, but Checkland recommends to first look at steps 3 and 4 in figure 13. They will give the modeling more depth in regards of a source of questions to ask in real situations.

3. In the development of RD as a method Checkland did discover the usefulness of a completely general model of any purposeful activity to declare what exactly was meant by "purposeful activity". This gives the mnemonic CATWOE.

"The concept here is that a purposeful activity is defined by a transformation process and a worldview (a T and a W):

- Will require people (A) to do the activities which make up T;
- Will affect people (C) outside itself who are its beneficiaries or victims (C for "customer");
- Will take as given various constraints from the environment outside itself (E) (such as a body of law, or a finite budget);
- Could be stopped or changed by some person or persons(O) who can be regarded as "owning" it."

Furthermore Checkland points out that many people find it useful when building the model to start the process with the T and W elements and then carry on with the remaining elements. When in the CATWOE guideline it can be very useful to think ahead and ask yourself⁸³:

"What would be the measures of performance by which the operation of the notional system would be judged?"

⁸² Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, pp. 39-42

⁸³ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 42

This can be helpful in sharpening up the thinking about the purposeful activity being modeled. The following three criteria's are always relevant in every case and should always be named⁸⁴:

- *Criteria to tell whether the transformation T is working, in the sense of producing its intended outcome, i.e. criteria for efficacy;*
- *Criteria to tell whether the transformation is being achieved with a minimum use of resources, i.e. criteria for efficiency; and*
- *Criteria to tell whether this transformation is helping achieve some higher-level or longer-term aim, i.e. criteria for effectiveness.*

If we once again apply this to our example previously used, we will have the following statements. Does this count as a "mowed lawn" (human judgment would decide)? Is the lawn mowed with minimum use of the resources i.e. equipment and time (cost)? Does the mowed lawn enhance the appearance of the property (human judgment would decide)? It's important to realize that these three criteria are always independent of each other; Checkland makes the following example of this⁸⁵:

"The purposeful act of taking a drug to relieve your headache might be efficacious if the headache goes. But it could be inefficient if the drug cost too much or was very slow-acting. And it could also be ineffective, medically, if treating the symptom of the headache was unwise because the headache actually signaled a more serious complaint."

In addition there might be other criteria that must be applied to building the model in some cases, one example could be an ethical criteria, is it a morally correct transformation?⁸⁶

4. The final consideration in (figure 8) when formulating RD is if they are "Primary Task" or "Issue-based" definitions. Like much of SSM Checkland found the usefulness of this consideration through experience. The background to this was that in the early days of system engineering, development was institutionalized, and the development was tied to departments and divisions etc., so the development was all tied up to functional sectors like R&D system, a marketing system and so forth. This does not have to be wrong but can put limitations on the thinking of the team carrying out the investigation. Since many activities carried out cross organizational boundaries that can change over time it showed to be useful in many scenarios to make models that are not tied to organizational boundaries. These were "Issue-based" models from "Issue-based" RD's⁸⁷.

Checkland's experience is also that when using Issue-based models, it often catches everyone's attention because it sets focus upon the different departments' and sections' existence and that is very much tied to the ongoing power-play within organizations. However there is no need to choose one model, to the contrary Checkland suggests that the general rule is never to work with only one; most investigations will benefit most when a mixture of both types is used⁸⁸.

⁸⁴ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 42

⁸⁵ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 43

⁸⁶ Ibid

⁸⁷ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 44

⁸⁸ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, pp. 43-44

5. Checkland's final suggestion is to not take your eye off the root definition and start modeling some real-world version of the purposeful activity being modeled. This can easily happen even among logical thinkers, because in essence the only thing needed is logical thinking⁸⁹.

As an example of this Checkland tells presents the following case⁹⁰:

"In work in a medium-sized manufacturing company, concerned with various issues regarding product distribution, it was easier for the SSM practitioners to build relevant models than it was for the distribution manager. He kept slipping into modeling the current ways of working in his department rather than the concepts in RD's. If you do this, of course, you find yourself not questioning the current practice but comparing X with X – not very profitable"

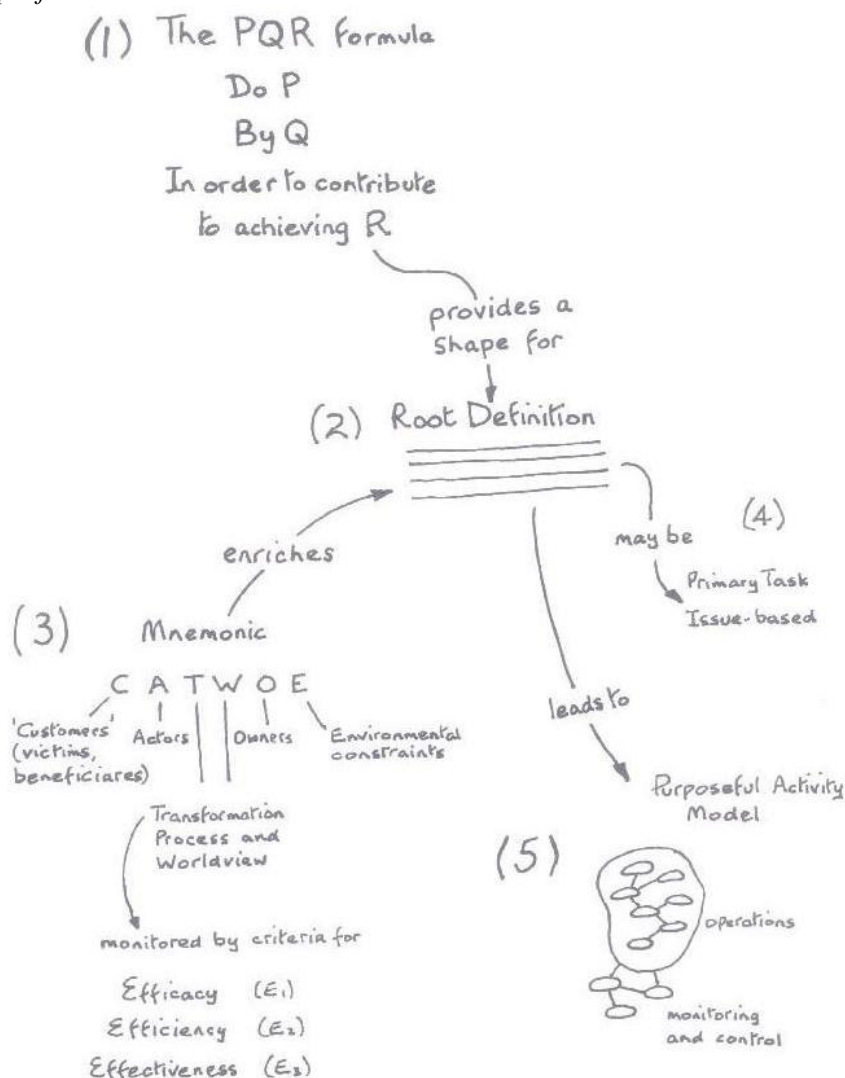


Figure 8⁹¹ Making activity models

⁸⁹ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 45

⁹⁰ Ibid

To avoid losing track of the model building Checkland recommends a guideline from psychology. George Miller has published a well recognized paper in cognitive psychology where he suggests that the human brain may have the capacity to cope with around seven concepts simultaneously⁹².

If the number seems low it can be important to bear in mind that an activity in the model can itself in more detail become the source of an RD and a new model. For an example if one activity would be to "1. Obtain lawnmower", this could be expanded into the following activities since they all derive from first activity in the parent model:

- 1.1 Check out suppliers different models
- 1.2 Obtain prices
- 1.3 Select the best offer

Even though coherence is maintained when expanding a RD it should be used with caution, Checkland emphasizes that in more than hundred studies it has never been necessary to expand beyond two levels below that of the parent model and then only expanding a few activities at the lower levels⁹³.

3.10 Using models to structure discussion

To justify the use of models to structure discussion Checkland uses an example of a typical management discussion that he regards as characterized with a remarkable lack of clarity. When in discussion different voices will be addressing different issues on different levels, short-term tactical to long-term strategic and different time scales will be assumed. The confusion created will then be a great cover for personal agendas of both business and private nature⁹⁴.

If we were to use models to structure the discussion it would result in decreased confusion and help us to do better than in the example.

This phase is usually refereed to as a "comparison" between the situation and models, but that phrasing can be really dangerous if we by that focus on the deficiency in the situation against the "perfect utopia" in the models. Checkland really emphasizes this⁹⁵:

"The models do not purport to be accounts of what we would wish the real world to be like."

This is due to the simple fact that the artificial devices have one worldview whereas real situations with humans always contain conflicting worldviews.

This can be a little hard to grasp at first but some examples of what questions could be suitable to ask probably makes it a bit more clear⁹⁶:

⁹¹ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 40

⁹² Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 46

⁹³ Ibid

⁹⁴ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 49

⁹⁵ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, pp. 49-50

⁹⁶ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 50

"Here is an activity in this model; does it exist in the real situation? Who does it? How? When? Who else could do it? How else could it be done?"

Checkland found out that in general many groups find it very difficult to answer questions about performance within the model, for example; what criteria would indicate the degree to which this activity (i.e. mow the lawn) is efficacious, efficient and effective?⁹⁷

In the example of moving the lawn this might not be all that difficult, but most real world situations are much more complex than this and could be a lot harder to answer.

Even though it might be a difficult question, it draws attention to the need of structured monitoring which is often given little attention. On a broader perspective it's also a good starting point for finding out about other worldviews since the model is based on a specific worldview⁹⁸.

There are three different approaches in how to conduct this questioning⁹⁹. The first one is the informal approach and having a discussion about improving the situation in the presence of models.

The second one and most commonly used is a more formal approach to create a chart matrix. As seen in table 2 the left-hand column consist of activities and connections from the model and the other axis is questions to ask about those elements, these are not static and can vary depending on what is investigated.

Then the only thing left is to start filling in the matrix without getting bogged down but to have a light-footed approach to quickly search through many activities and questions.

The final approach is to use the model as a basis for writing an account of how so some purposeful action would be done according to the model and then comparing this scenario with the real world.

The common thing with all these approaches is that they are used to structure discussion with the aim of finding a real situation and ways of improving it, which different people with different worldviews can live with! Checkland points out that¹⁰⁰:

"Outside of the arbitrary exercise of power, this is the necessary condition which must be met in any human group if agreed "action to improve" is to be defined".

⁹⁷ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 50

⁹⁸ Ibid

⁹⁹ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, pp. 51-54

¹⁰⁰ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 54

Activities from the model	How the activity is done	Measures of performance	Information needed	Information support provided by	Information gaps and opportunities
4.1.4 and 4.1.5 Receive request for service, and accept patient	Letter, phone call	Speed with which the request is handled	Patient's details, clinical condition, and history Contract situation	Patient administration system (PAS)	Automatic generation of letters to patient and referrer Up-to-date contract situation
4.1.6 Diagnose problem	Consider history Examine patient Conduct investigations	Medical audit	Case notes Results from investigations		Case notes often missing Much duplication of recording of patient's details Delays in receiving test results
4.1.7 Treat patient	Conduct procedures/operations Prescribe drugs	Medical audit	Availability of facilities (theatres, anaesthetists, etc.) Drug effects and interactions	Theatre booking system	Systems not available at ward level
4.1.8 Discharge patient	Discharge summary Discharge letter	Speed with which produced	Post-treatment test results Availability of discharge facilities Coding	PAS	Links to ongoing providers of care Automatic generation of discharge summaries and letters Support for Read coding

Table 2¹⁰¹ Model to structure discussion

3.11 Defining Action to Improve

In work carried out within the SSM-study it is important to acknowledge that the purpose is not to find consensus but to find an accommodation among a group of people with a common concern. This does not mean that it's not possible to find a consensus but that a true consensus is a rare case among a group of people, and is usually found in issues that are trivial and people don't feel very strongly about. And where an SSM study is carried out, it's not usually a trivial problematic situation. But Checkland emphasizes that the view of conflicting worldviews counteract consensus is not be regretted because it can be a great source of strong feelings, energy, motivation and creativity. If your models are not leading to an energetic discussion, formulate a more radical RD!¹⁰²

In finding accommodation its best not to discuss the abstract idea of "accommodation" directly but instead to approach it through what changes might be made in a situation and what consequences that change would result in¹⁰³. Checkland defines these three elements of change as; making changes to *structures*, changing *processes* or procedures; and changing *attitudes*.¹⁰⁴

The easiest to change is structures, this can often be done through the exercise of legitimate power, however new structures usually requires new processes and attitudes by the people carrying out these processes or at least being affected by them.

¹⁰¹ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 121

¹⁰² Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, pp. 54-56

¹⁰³ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 56

¹⁰⁴ Ibid

To define the new processes required is a much harder task for organizations and no one can be sure about how to change the attitudes in a unique social situation in the direction requested¹⁰⁵.

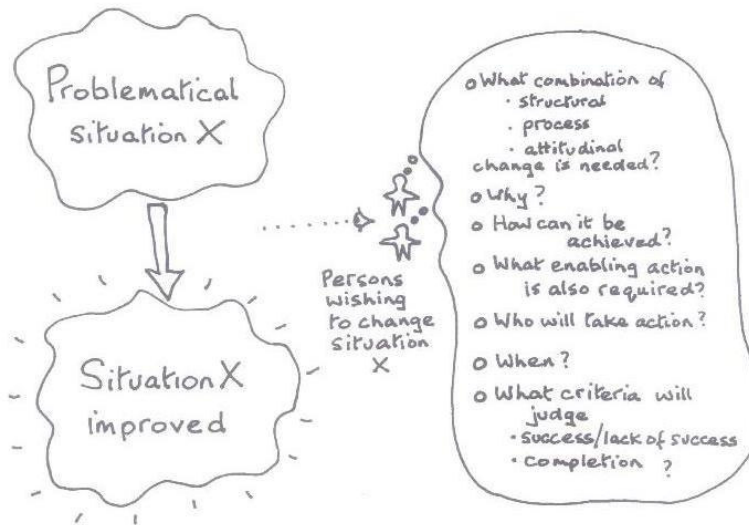


Figure 9¹⁰⁶ Action to improve

Figure 9 above illustrates the change process as viewed by SSM. The enabling action question may need some further explanation. This is because there might be multiple tiers for the enabling action to occur. Checkland uses the following example¹⁰⁷:

"...when working within the UK National Health Service for the first time, in the early 1970s, the authors quickly found that in an acute hospital no proposed change would get accepted unless it had the support of senior hospital consultants. Shifts in the disposition of power have now modified that, but at that time in the history of the NHS, enabling action to secure the support of senior doctors was essential if any change of any kind was to occur in a hospital!"

Checkland also points out that in the last question shown in figure 9 about what criteria will judge success/lack of success the practitioner should be aware that it's well worth doing but don't expect people to have any ready answers¹⁰⁸.

¹⁰⁵ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 57

¹⁰⁶ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 58

¹⁰⁷ Ibid

¹⁰⁸ Checkland, P. & Poulter, J. (2006). Learning for Action: A Short Definitive Account of Soft Systems Methodology and its use for Practitioners, Teachers and Students, p. 58-59

4.0 The VCC Case

4.1 Step one, define the problematic situation

This is outlined in the introduction starting at 1.3. Readers are referred to that section for the problem definition.

4.2 Rich Picture

As explained in the theory section the rich picture is a good way of communicating to get a good picture and feel about the problematic situation that should be investigated. Since I was briefed about the situation before I started the study, I had a basic understanding of what kind of situation VCC found themselves in. One of my assigned instructors had just moved to her new position at the "Strategy & Process leadership" department from a former buyer position in the "Electrical purchasing" department. Since it was just a matter of weeks since she was a buyer and no particular changes had been made since she moved, her knowledge and perspective on the situation could be regarded as good as any buyer's. So during two interview sessions and quite a few short questions afterwards for feedback I developed the first version of the rich picture. This was then complemented with three interview sessions with both a buyer and group manager in electrical purchasing and also a finance manager at the purchasing department. The resulting and final rich picture is displayed below in figure 10.

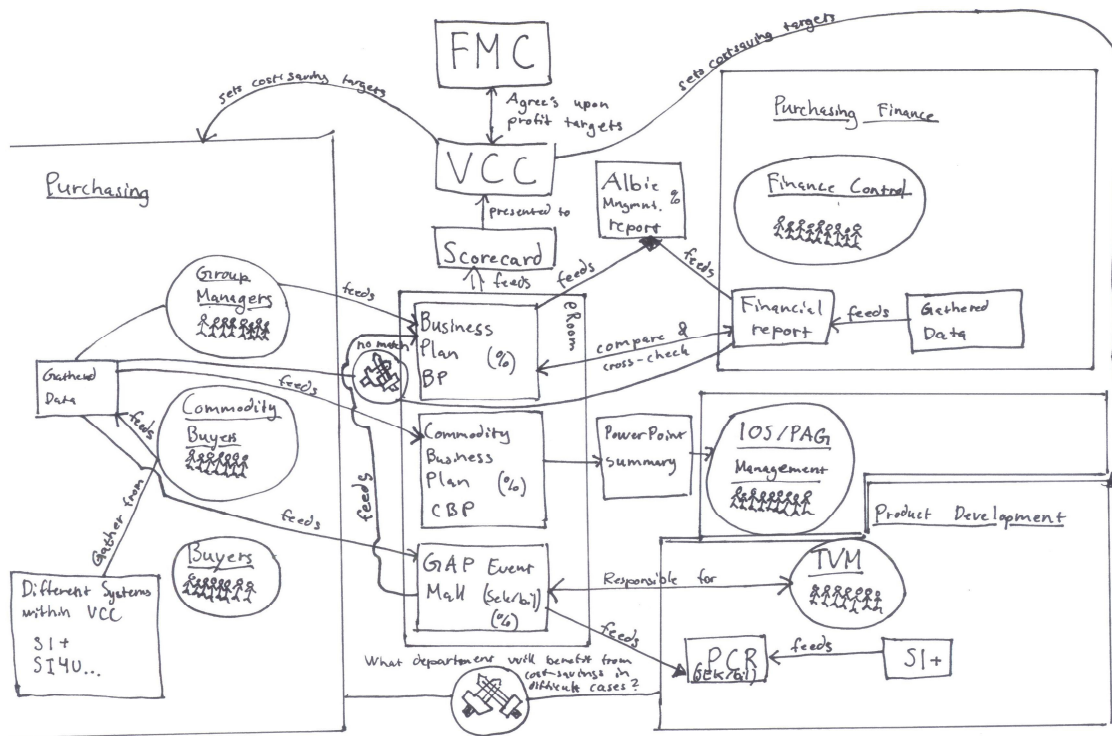


Figure 10 Rich picture

Most of the suggestions made by the interviewees were quite straight forward since the following interviewees did acknowledge them and did not object to them. However there were a few things that need some further explanation. First of all it's the arrows between FMC and VCC that states "Agrees upon profit targets" and the arrows between VCC and purchasing and product development that states "sets cost saving targets". These were all originally marked "sets cost saving targets". This was strongly objected to by the finance manager who said:

"No, that's not correct, it's a common misunderstand that FMC sets cost saving targets upon VCC that communicates them to their different departments when the reality is that both FMC and VCC knows that they have to make cost savings. It is not like FMC just determines cost saving targets for VCC without being able to express their opinions, this is an ongoing communication between VCC and FMC"

She really emphasized that cost savings are not some targets set up by FMC that VCC could not express their opinions about. It was more a question about teamwork that resulted in mutually agreed upon targets working for the common good for both VCC and FMC. But the resulting cost savings targets put upon the departments of VCC were a little bit more straightforward than the targets set upon VCC as whole even though there was a two way communication to make the targets realistic.

Another part is the possible conflicting situation between Product Development and Purchasing marked with crossed swords and "What department will benefit from cost savings in difficult cases?"

This was recognized by all the interviewee's and the buyer said:

"There is a risk for possible cost savings to slip out of our hands about who should be credited for the savings. This is usually not a problem but can be if both departments has small margins to meeting their cost saving goals and need the cost saving"

This was explained in more detail by the group manager:

"If we were to make a cost saving of 5 SEK on a part with a split between purchasing and PD this would result in 2.5 SEK per department. If then PD needs to make a cost saving of 4 SEK they might choose another alternative approach "C" which would result in a cost saving of 4 SEK for VCC instead of 5 SEK. This would not be a rational thing for VCC as a whole but would be for PD"

Even though one alternative might be the best option for a department to meet their own cost saving targets it might be the wrong decision since of course the aim of all the departments should be to save costs for VCC. We can conclude that a systematic error is being conducted in the cost split between departments, which is not in the best interest for either VCC or FMC.

Another conflicting situation is the gathering of data by the purchasers that makes up the Business Plan and the gathering of data by the financial department. Since they are free to gather their data from any source they judge the best, even though much of it comes from the "SI Plus" system, it can lead to discrepancies when cross checking the business plan with the financial report. The group manager states:

"Its not easy to determine how you should gather your data (interviewee puts his finger up in the air as to measure the wind), you really got to have a good feel about how you should present the numbers, and for me as an engineer this is very hard to accept to not have perfectly matching numbers"

When discussing this topic further with the finance manager she states

"...Much of the problem lies in where in time and how you measure your numbers since they constantly change through time due to various constraints. If for example one part originally should have an optimal price of 100 SEK but then later during the year is going through a technical change it has to have a new article number and then the new price for example 105 SEK is set for the new article number, and then that price could be negotiated lower by the responsible buyer to for example 102 SEK"

One part, which is basically the same as an old part, is in the system a new part with a new article number after the technical changes has been completed making it difficult to trace and measure for purchasing. This is necessary because as far as the PD department is concerned it is a new article with new blueprints etc.

This is also recognized by the buyer who says:

"One measure is the average cost/per car so when people buy more expensive cars then the average price goes up even thou we might have actually lowered the costs for the specific parts... very hard to measure... we at the electrical purchasing also optimize our variations of the electronics to fit the customers demand for a customized car... since we don't know exactly what cars will be bought this has to change throughout time... one selling point of buying a Volvo is that the customer can individually customize the car in many ways"

Furthermore it might be a little confusing that there is both a "score card", "Albie management report" and "PowerPoint summary" for IOS/PAG management. The simple answer is that both the "PowerPoint summary" and "Albie management report" are just simple presentations and reports with extracted information from the main reporting sheets customized for the receivers. It is important to emphasize that these additional reporting tools do not contain any new information, merely have other ways of presenting it that's more suitable for the receivers. To further clarify this matter, the name "Albie management report" refers to the name of the current senior vice president of purchasing.

4.3 Analysis

4.3.1 The Intervention

The original idea of a review of the financial reporting by purchasing during the spring of 2008 was decided before this thesis was considered. So basically this study will act as a starting point and a basis for further review work during the spring. Since I am the only student working on this essay, my scope must be limited as a process as big as this one with so many people involved will obviously be quite comprehensive to carry out. Even though the study will work as a basis for the upcoming review, this work has no direct relationship with the upcoming work, due to the simple fact that it has not yet been initialized. Obviously it is then my and my supervisor's wish that has shaped the intervention.

As mentioned in the introduction I had a summer employment at the same department as I am now conducting this study at, and before I ended my job I submitted a profile regarding my interests, wishes and experiences to my supervisor, Martin Kruse, to check if any possible study tasks were suitable for me. After a few possible suggestions and some discussions back and forth this was concluded to be the best option for both parties.

Furthermore on this subject the whole idea of looking at the reporting process was initially that the buyers experienced difficulties in their work and felt that they lacked the right tools to perform the tasks set upon them. This was known by the "Strategy & Process Leadership" department and therefore the idea of performing a study to improve this situation was suggested by Martin Kruse.

The three key roles according to Checkland would in this case be:

1. *Clients*: The author, Group manager Strategy & Process Leadership, Buyers
2. *Practitioner*: The author of this essay
3. *Owner*: Group Manager Strategy & Process Leadership

4.3.2 Social analysis

Nothing worth noting was discovered.

4.3.3 Political analysis

Nothing worth noting was discovered.

4.4 Making activity models

4.4.1 Root Definition

The first thing to determine when starting the iterative process of a root definition is the PQR formula. Since the study is conducted at a company and the employees have to take time from their normal tasks there is a limited time frame for how much time I can occupy them with my work. I was fortunate to be able to attend a group meeting to discuss the root definition with everyone at electrical purchasing but within a limited time frame. To get the most out of this meeting I first conducted an interview with one of the buyers to be able to get his view on the root definition with the hopes of getting a flying start for the group meeting with a good foundation to continue the discussion upon. My hypothesis was that the meeting could then focus on modifying the root definition to fit the worldview of electrical purchasing instead of making it from scratch and therefore save time.

4.4.2 CATWOE

Checkland recommends starting out with the T and W in the CATWOE and his recommendations were followed.

The first interviewee had understandably some difficulties in suggesting a PQR transformation from scratch but after quite a lot of thinking I, the practitioner, suggested a possible PQR transformation to get started. This transformation was accepted by the interviewee who thought it was probably right.

P: Reduce costs for every car produced

Q: By reducing the costs for every part bought

R: To increase contribution margin on every car produced and obtain a cost effective process

After this conclusion the "W" in CATWOE was easy to determine since he was an electrical buyer, so that would simply be "electrical buyer".

With these two parts of CATWOE defined we carried on from the top, namely C (Customers)

"Well, of course that must be people in a leading position! Management!... our work here goes back to the ones who are going to determine how much we can charge for the cars, some kind of marketing side... this is a big company so you don't know what everyone is called that works with collecting this data, but they mostly work with calculating the price of new cars. What complicates this is that we have "ÄT" two times each year, change occasion, where you reconstruct the whole car which makes it a totally new setup almost even though many details continue to exist, getting back to the issue...some sort of market... business.. I don't really know what they are called...let's say sales!... We also need to communicate with PAN brand"

This resulted in the following customers:

C: Purchasing Management, Sales, PAN Brand

Carrying on to the Actors section the interview continued with

"Who are the actors?"

Well, that is the buyers... and also cost estimators must be included here! And also the people at TCM must be included... in conjunction these to can determine what the part should cost.. Product development, PD"

This results in the following actors:

A: Buyers, Cost Estimators, TCM, PD

"I: If purchasing management want to change this, of course they can...I find this hard to tell...hmm... Do you have any suggestions?"

P: How about VCC board of directors?"

I: Let's go for that!"

This results in the following owner:

O: VCC Board of Directors

"Purchasing head count... what is decided about the PAN Brand in the FMC world, global and European activities, can affect how we must act at purchasing... and also raw material prices and these things, although they might not have so much to do with the organization... raw material prices and exchange rates... FMC has said that they want more cooperation with the suppliers globally... and for us it means that we should continue to work as we always have... and of course that policy affects us..."

E = Purchasing head count, PAN brand, raw material, exchange rates, FMC policy

4.4.3 The Three E's

"What we really work with here is make sure we are not paying too much on a basis of what the engineers say we should pay, the problem is that this goes up and down so fast outside our control which makes it hard for us to be as effective as possible, it is a moving target... how to make a criteria is quite difficult... it's hard to stay low as, soon as we make a new sourcing, it goes up again... there is also an incentive for both... we here at purchasing has targets every year to reduce this by negotiations each year with a certain amount of percent, and product development has ratio targets set upon them... and actually if you make a sourcing with a little to high price makes it much easier for purchasing and product development to meet their short term targets... this makes it hard to do this effectively on a long-term basis and how to express this in one sentence could be difficult...the products life time cycle time is a little bit too short... I mean the components cycle time..."

P: How about getting as close as possible to TCM's targets?

I: That is true... that is what we are trying to do... the problem is that all data is not available when the sourcing occurs..."

E1 = To be as close as possible to the estimation created by TCM/CE

"I: long pause..."

Maybe that the buyers spend as little of their working time as possible within the system?

I mean administrative tasks, minimize the administrative work...!"

E2 = Minimize administrative work

"I: Long pause... I don't know... What have you written?"

P: VCC accomplishes their profit targets and effectiveness their internal reporting processes to reach long term profitability and competitive working processes?

I: Today we are measured based upon how much we lower our costs...compared to how much FMC would have paid for their parts if they didn't make any cost reductions. That way of measuring is quite blunt, a much better measurement would be to measure how much the GAP is...and make sure it's consistent or slowly reducing... if we could measure that we would have a better long-term profitability and we would get away from this... what was the question... paid price versus theoretical price, what they are working with is a zero base estimate... Tracking of GAP to zero base estimate!"

E3 = Tracking of GAP to zero base estimate

So in conclusion we can summarize the results:

P: Reduce costs for every car produced

Q: By reducing the costs for every part bought

R: To increase contribution margin on every car produced and obtaining a cost effective process

C = Purchasing Management, Sales, PAN Brand

A = Buyers, Cost Estimators, TCM, PD

T = Reduce costs for every car produced

W = Electrical Buyer

E = Purchasing head count, PAN brand, raw material, exchange rates, FMC policy

E1 = To be as close as possible to estimation created by TCM/CE

E2 = Minimize administrative work

E3 = Tracking of GAP to zero base estimate

4.4.4 Group Meeting Root Definition

All the above information gathered from the buyer was a great input in the iterative work of producing the root definition. To get a better understanding of the view of the electrical purchasing department as a whole this root definition acted as a basis to bring along to a group meeting with everyone at electrical purchasing and discuss it to come to an understanding everyone can live with. Since I had a limited time to my disposal my hope was also to save some time when already equipped with a worldview hopefully close to the opinions of the rest of the electrical purchasing department.

Group Meeting

As with the above interview the process started off with the PQR transformation after a crash course in SSM. At first the meeting started out with rambling discussions, and after a while it was agreed upon that the presented PQR transformation was probably ok. This turned out to change after moving on to the CATWOE and getting a deeper understanding of the method in action and also getting a discussion going. After completing the discussion about (C) Customers and moving on to discuss (A) Actors the following interruption by one of the buyers took place during the discussion:

B2: ...Working with reporting you say... but isn't it really about what is stated in T? To reduce the price?

B3: Finance is included now anyhow

B4, B2: But they don't work with reducing the price

B4: They work with reporting perhaps, but not lowering the price!

I: So then the question is, have we done our T (PQR) correct or should finance not be included here?

B1: If we add show, show reduced cost for every part produced...Isn't that what reporting is all about?

B2: Well, reporting yes, but PQR, isn't that why we should do reporting?

I:...Well, yes, what is the point of doing reporting now and how should we conduct it in the future...

B1: Isn't it really about having a common goal to work towards? That's true isn't it? Reporting is important for everyone to be able to track their progress towards meeting their objectives/goals... Even if we didn't do all this reporting, perhaps we would save an equal amount of money, but we wouldn't be able to show it.

B4: That's how it was like ten years ago, perhaps it was not possible to show it in the same way as now, but everyone did it without being reviewed.

I: Then perhaps the point is showing instead of reducing, reducing is perhaps something you don't do directly with the reporting...

The study now suddenly took a very interesting turn, also proving the iterative process that SSM is all about, one thing may trigger a whole new discussion forcing us to rethink what we just a minute ago agreed upon, or at least was the best answer for the moment.

It was agreed upon among the group that finance would be an obvious actor in the system since they worked with reporting. One quick and sharp-minded buyer realized that this particular actor was not involved in the PQR transformation, in this case reducing the price for materials bought. This statement was supported by another experienced buyer stating that ten years ago there was very little reporting being done but price reductions were made anyway, proving that the reporting in itself did not achieve price reductions. This developed the theory that by reporting we are merely showing the price reductions made to be able to track our progress towards a common goal. Since this newfound knowledge was found during the process of defining the actors within the system it was soon discovered that this change in the PQR transformation suddenly affected all the actors defined as well as the whole CATWOE.

B2: In that case we can remove everyone under "A" and replace them with managers and finance, right?

B4: They are the only one "showing"

B2: Then it's a totally new question

I: But the buyers, don't they help out with the basis of reporting? Shouldn't they still be part of the actors group?

B1: Hmm... but what we really are reporting is the progress... show saving progress!

B4: But we don't show that for every car produced

B1: Yes, we do, in the PCR

B2: Wait a minute, if we go back to C again, we have suddenly changed our aim and tasks radically, it was stated that we should lower the price, now its stated that the important thing isn't to lower the price but merely to show the cost reduction

B3: But to be able to do that you must make a cost reduction to be able to show one!

A suggestion was made to start over with A (Actors) and replace everyone defined by managers and finance and a suggestion was to define the PQR a little bit narrower as "showing saving progress" instead of the more wide definition of showing cost reductions. It was further discovered that naturally you have to make the cost reductions to be able to show them and this yielded some confusion of what we were trying to achieve;

B2: What was the question here really all about?

I: ...To define the purpose of the system...

B1: So we are bringing about improvement, by making visible!

I: So the point of the system then really is to make visible to bring about improvement, but bringing about improvement doesn't the system by itself accomplish... lets try writing that down

This suggestion that we achieve improvement for the company and thus the organization by making visible where we are at the moment when it comes to cost reductions clarified the general purpose of reporting and the discussion continued to discuss PQR:

B4: Shouldn't it be for every car produced in "Q" too? Isn't that what we are trying to show here at purchasing?... Even the first line is wrong now, for every car produced, that's not what we are showing at purchasing...

B5: How about show saving progress for bought material?

B2: Wasn't that the question, how do we do that? I thought this was a process were we state what we are doing and then this should be processed and then a result would show up to tell how we should do this. If we already show what we should do here, then we have solved the problem?

I: Yes...

B1: So we should really have the optimal answer here?

I: Yes, or really, it's your view of the solution

A suggestion was made that the important thing was to show the savings for each car that rolled out of the factory, and it was suggested that this should be encapsulated in "show saving progress for bought material". After that some confusion occurred regarding the result of the ongoing progress where upon I, the practitioner, tried to emphasize that it's the optimal answer from the worldview of the group that is the point of the exercise. After this was cleared up the discussion quickly moved on to discuss "R" in the PQR formula;

B1: The "R" is still right, isn't it? The overall aim is that by reporting a lot we will accomplish it?

B2: I am not sure...

B3: I think the last sentence is enough in the last row

I: You mean it should be for both Q & R?

B3: No, no, to achieve profitable growth, that's something you just do

B5: What are we really trying to achieve here? Is it getting from P to R or trying to get something from some kind of investigation? You just want one reporting system for TVM, finance and R&D?

I: No, just how are we going to "show saving progress for bought material", that is "Q"...

B1: You should define, what is most important for profitable growth, measure it...

B5: The thing is to clearly show what we are actually saving, at the moment we have three different systems, one showing in SEK, one showing in percentage and another one and its not clear how much we are actually saving, we are reporting the same thing in three different ways, if we report the same thing in one way it becomes simpler, it becomes easier, and we actually start achieving what we hope to achieve.

B4: One common system!

B5: Yeah... one system for internal reporting.

B4: To achieve profitable growth

B5: Yeah, I mean, if you imagine all the time we spend reporting stuff, imagine if we got three different reports to report stuff out of it takes up a lot of time, for instance if you spend one third of the time reporting and the other two thirds actually spending time with the suppliers questioning the costs we might actually achieve more savings, rather than spending time answering questions about "hang on, it says twenty percent here, that means 5 million SEK overall, what does that mean in dollars?"

B1: Common or one system?

B3: One common system!

I: Does anyone have anything more to add or shall we move on?

B4: I think we can remove everything except “achieve profitable growth” on the last row, if you should include profitable growth that’s enough.

B1: To achieve profitable growth?

B5: Yes!

B1: Yes, that’s got more striking power

It became very clear that the current way of reporting in different ways for different persons took up a lot of time which the buyers felt took time away from what they were hoping to achieve with the reporting, namely reaching their cost saving targets and become more profitable. Much of this work of adapting the numbers to different receivers could hopefully be solved by using one common system to avoid unnecessary confusion and waste of time to achieve the goal of “achieving profitable growth” that was the agreed definition of the “R” in PQR .

As the sharp reader probably already have noticed it is not convenient to publish the discussion totally in chronological order, because then we would have to move back and forth in the work with the root definition, so we will now take a step back in time and look at what was said about (C) Customers before the discussion of the T transformation started to shape form;

"B: This "T", is that for all the commercial reports? If so R&D Management is equally involved as purchasing management! You should write down both purchasing and R&D management!"

"I: ...Shall we toss Sales and exchange it for...?"

"B:... Well, yes at least PD (product planning) should be there..."

Sales was removed from customers and replaced by Product Planning (PD) and Research and Development (R&D) management. These changes resulted in the new customer list consisting of:

C = Purchasing Management, R&D Management, Product Planning, PAN Brand purchasing

As the (T) transformation discussion appeared while discussing (A) Actors a few things about the actors group had to be mentioned in that section to maintain the consistency of the discussion. The discussion about which the possible actors should be continued after the (T) Transformation discussion;

"...We have got TVM with the GAP sheet?... Shouldn't that be under "A" Actor?"

"I: Actors are the one working within the system to make the transformation happen...customers are the ones receiving that transformation so to speak...there lies the distinction..."

B1: Should STA and logistics be placed there then?... They can't affect the financial result, but they can affect the requirement levels set upon us with a base in the technological progress.

I: Do they really work within the system or are they just affecting the system from outside?

B2. No, they are probably outside the system then...

B1: ...Shouldn't group managers be placed here?... All managers are more or less involved in the (financial) results... Everyone passes on the reports, even Albie (CEO) passes on his reports.

B3: Then just write managers?... And what is TCM's contribution within the system?... They are calculating production capacity!?...If STA is on the customers list, shouldn't TCM be there to?

B2: I don't know what STA is doing on the customers list...STA is really about setting the GAP's and finding space for cost reductions

B4: Logistics should at least be included!

I: Are they just called logistics...?

B3: MP&L

B2: STA ended up under C (customers), I can't see why!?

I: Do you mean they should be under A?

B2: No, I don't think they should be included whatsoever.

B1: I have also been unsure about if STA should be included.

Worldview:

The worldview was the simplest thing to define because the discussion took place during the group meeting of electrical purchasing and hence there were only buyers from electrical purchasing present so the answer naturally became

W = Electrical Purchasing

Owners:

I: Okay, let's go for that, short and clear!... Okay, let's move on to "T", for bought material T was what we said there, right?... And "W" is not so much to talk about since it's only electrical purchasing here... but "O" the owners of the system?... Is that VCC board of directors or someone else?

B5: You are reporting within PAN brand aren't you? Within TVM and electrical at least.

B1: Yes!

I: So its PAN Brand board of directors then?

B5: I would say that, yes!

The original owner "VCC Board of directors" was replaced by "PAN Brand board of directors" although it was emphasized that this at least was the case for electrical purchasing and there was some uncertainty whether this was the case for all of purchasing. After having that sorted out (E) Environment was next thing to deal with;

I: Okay!..."E" Environment!

B3: One thing that we don't mention here at all is the D&D money upon the article price that we can never get any productivity upon. When we got zero GAP and also got a D&D placed upon the article price we can never get any productivity, they can't have these productivity plans when there is a D&D present. The D&D should be a separated factor...we can deliver results on the rest, but not on the D&D money!

B1: Exactly and it destroys all reporting as well!

B3: If it is to be placed under E or somewhere else I don't know, but it has to be somewhere!

I: What is this all about?

B1: If we buy a thing for 10€ then there could be a 2€ development charge as well

B3: We haven't paid for the development cost in the beginning to the supplier so it is budgeted upon the article price. And when we are supposed to deliver 5% productivity, we can only do that upon 10€ and not 12€, but in the system it is stated 12€ and that's what they expect us to deliver productivity upon

B1: So it never becomes 5% but instead 4.x.

B3: Or else we have to take 6% to be able to meet the target of 5%

B1: That is quite annoying!

I: I understand, I wonder if it is correct to put this under "E"...

B3: Well, it is an outside factor that is affecting the system

B1: It is someone who has come up with the idea that it should be done like this...

B5: If you only got one system for reporting it should be easier to show the problem, isn't it? Whereas at the moment it is very difficult on different areas to show where the problem is, if you got one system...

B3: And you compare one file from Ford and one from VCC... so it's not the same price

B5: Yeah

I: Right!

B3: D&D stands for design and development

The first thing that came up was the Design & Development (D&D) charge that was a very annoying factor for the buyers. It was unknown who had decided that the reporting should be done in this way, but it was clearly giving the buyers a very hard time in their reporting work. As explained in the example, instead of having the D&D charge on a separate account it is placed upon the article price and therefore affecting all productivity goals, which are supposed to be on the article price without counting in the factor of the D&D charge. Hence it messes up the 5% target, which instead becomes 4.x%.

I: But how about the other ones, should they still be here?

B1: PAN Brand doesn't really say anything, PAN Brand what?... PAN Brand target perhaps?... I think we should say PAN Brand sourcing decisions!... It might not always be the master decision, but for VCC it is.

B3: How about volumes?

B4: Volumes can be an important part

B1: Yes, it certainly affects the way we present our figures in different formats.

B3: Yes, present turn-over, in months and also the Jaguar/Land-Rover variant and also the amount of cars sold that affects the detail price when we can't get large enough volumes. So its both turn-over volumes and amount-sold volumes...

I: Volumes then...

B1: Turn over and volumes!

B3: That's two separate things

PAN Brand was considered to be a too vague definition of their involvement in the system and that it was really only PAN Brand sourcing decisions that were relevant. This is the decisions made by PAN Brand for all the purchasing organizations among the different brands in the group. For example PAN Brand can decide that VCC purchasing should start purchasing a particular article for one or several brands within the group to get bigger volumes and a better leverage towards the supplier, thus making a more profitable purchase. This goes hand in hand with volumes that can be both turn-over volumes if the purchased volumes are big enough and also amount-sold volumes depending on how the car sales goes. The distinction here is that PAN Brand can give sourcing decisions that affects the volumes but the volumes can also be influenced by how the car sales goes and if the volumes are large enough regardless of PAN Brands sourcing decisions.

Actors:

B2: Question is if cost estimators, TCM and PD is really involved in the transformation "T"

B1: Well, they also calculate money. GAP Event calculates...

B3: Shouldn't we write TVM instead of TCM here?

B1: Finance as well!

I: Is that finance or purchasing finance?

B1: Both R&D and purchasing finance work with that...

B3: Maybe we should stick with R&D everywhere since it's the same thing as PD so we have consistency.

Then a discussion arose about cost estimators (CE), Total Cost Management (TCM), Team Value Management (TVM) and Product Development (PD) involvement in the PQR transformation "T". To understand this a few words must be said about these departments. CE works with estimating the articles material costs, for example a light bulb is broken down in all its parts with glass, metal, connector etc and then it's calculated how much the cost for all containing parts should be and hence how much should be paid for this article. TCM on the other hand works with improving the manufacturing process for the articles, for example checking how much time it takes to assemble part x with part y in the production plant and trying to get the manufacturing as lean as possible. Both CE and TCM is part of TVM but some employees at TVM work with other things such as emerging markets sourcing (EMS) to meet the goal of having a certain amount of the production placed at emerging markets where the production costs are still low.

It was concluded that TVM was the right choice instead of TCM since TCM wasn't the only group within TVM working with calculating numbers and reporting them in one way or the other. Also purchasing finance and research and development (R&D) which is the same thing as product development (PD) was included in the list without much debate.

4.4.5 The Three E's 2

The group started to really get used to the SSM methodology and quickly grasped the concept of the three E's even though the distinction probably can be somewhat confusing for the first time user.

E1:

"I: (Reads out Checkland's three E's and how they work)

B2: When we changed T it appears we have to change a lot of things, we can start of by replacing "doing" with "showing".

I: Okay, let's do that

B1: Measurability could be an issue here somewhere...

I: One point somewhere could perhaps be to show useful and reliable figures perhaps?

B1: It's important that figures we produce is so reliable so they can be used in business planning. Are they that today? No, everything that showing is pretty much ad-hoc since it's based on Excel sheets it can easily happen that some formula error appears.

B2: ...When you report a result you want some kind of repeatability. When you have a certain result you want to be able in the future to alter different kind of parameters and get a reliable result out of it. And it feels like what we measure is already so uncertain so when you want to make an economic forecast with a few unknown parameters it feels like that forecast is going to be extremely unreliable.

B4: Show correct savings...show correct price estimate, do we only want turn-over or cost saving measurement?

B2: In some way we would like to measure in different ways the same result would show up in summary on for example on supplier, article, commodity etc. and then you could verify that you get the same result everywhere

B4: Cant we then write "show correct savings" and explain that it means regardless of currencies or how you look at the figures you should get the same result

B5: Report the correct savings...

B4: The last one "zero base", is that really right?

B2: No, that's based on the old version as well"

It was quickly and without any real discussion concluded that "showing" was to replace "doing" in the original sentence in accordance with the discussion that took place in the earlier steps. The discussion once again picked up momentum when the discussion continued with the numbers presented and whether they are reliable enough to be used in business planning. This was concluded not be the case since the numbers was very much "ad-hoc" and customized to suit the current need. Furthermore since all the reporting is done using spreadsheets the possibility of typing the wrong formula or other human errors can easily slip by, since the error checking is close to non existent. This was suggested also to have an impact on the historical results. Since the numbers is used in the business planning it is important to have a historical consistency in the numbers so the results can be compared over time to make economical forecasts. To make a solid forecast it can be useful to be able to sort of different parameters that has changed due to different environmental constraints that impacts the numbers in different ways over time. The buyers considered this not to be the case at the moment since the base data was far too unreliable. Thus the important thing in regard of efficacy was concluded to be to report the correct savings regardless of currencies and other factors. No matter how you look at the numbers the base data should be consistent and reliable to get a thrust worthy result.

E2:

“B1: Time spent on reporting divided by time spent on negotiation... nah, hmm, maybe not, but time spent on reporting contrary to time spent on reporting that’s added value. The optimal would be that we just do our job and enter price reductions etc... That is the dream scenario, then we don’t have to alter the figures in any way, the system would output the results by itself then.

B2: That’s something that should be in SI+, that the data stored there should be enough to feed these systems, that’s something we don’t really do today either.

B1: No administration spent on reporting, right? Or no administration spent on fiddling about with the figures... we have to turn these figures around hundred times to match some other report.

B4: Verifying and checking numbers...

B2: No, Results!”

It became even clearer when working with the efficiency criteria that the buyers would like more support from the system in customizing the base data to fit different reporting needs and reduce or remove the manual work of “fiddling about with the figures”. The buyers currently use a system called SI+ to manage their different articles and bought materials where a lot of information is stored, but the system has no connection with the reporting spreadsheets and the necessary transactions of the information therefore is up to the individual working with the spreadsheets for reporting. However it should be noted that the information currently stored in SI+ is not sufficient to produce a report without the need of other data sources. So the criteria for efficiency became “no administrative work spent on verifying results” taking time away from the buyers’ main task of communication and negotiating with the suppliers.

E3:

“B1: The long term goal was profitable growth? Right?

B5: Make more money on each car, to make more cars, to make more money

B1: Well that we put in more time in activities that adds value. That we put in more time to achieve our target instead of showing it, now its more “show” than “achieve”

B2: If we assume that our price will be lower and lower for each year that passes, then we would be more and more profitable for each year that passes, but, you should be able to see that the total bill of material in some way becoming lower

I: Wouldn’t that depend on how well equipped we sell our cars?

B2: Well, you look at the price now and I am referring to the production costs. The cost of the material would in some way be measured for each car

B4: Is this still from the perspective of purchasing?

I: Well, yes, actually it’s your perspective

B1: The transformation was to show a cost reduction. Helping achieve, no, it must be that the materials costs less! And what kind of basis you measure that against that’s not up to us to determine.

B2: Yes, that’s how it got to be!

I: Do you have a suggestion how to put this into one sentence?

B1: Bought parts for a defined...

B2: Bill of materials...

B1: If we assume that the car doesn’t change anything over the years then the price for that particular materials would go down

B3: But what if we reach zero GAP? Then we can't reduce the price any further? So you can't say that you shall reduce the price every year!

B2: Well, if you also consider the ratio and the technical development and that they come up with smart and good new ideas down at R&D

B1: Parts bought at zero GAP!

B2: Now we are back to square zone...

B1: Perhaps that really is the goal of all this reporting, I don't know...

B3: They will not be happy if we have a zero GAP, then they are going to want 3% reduction anyway!

B2: If we are going to have a zero GAP this year, then one year from now we will have a 2% GAP.

B4: And in three years you suddenly have something to aim for.

I: Parts bought at zero cost GAP?

B5: Yes!"

Starting from the long term goal of profitable growth, it was supposed that this would be achieved by putting in more time in activities that adds value to the company, with the basic conclusion of doing this by spending time trying to achieve the goals rather than showing the progress towards them. Hopefully then the material costs would decrease at a higher pace in correlation to spending more time on commercial work instead of reporting. A discussion arose regarding how that would be measured, but the conclusion was that it really wasn't the buyer's task to determine that, even though it was suggested that it possibly could be done towards the production costs in some way. Since the progress towards the goal is measured in how big the gap is between where we are standing today in relation to the target found makes it interesting to discuss what would happen if the target was reached, i.e. there was none/zero gap. Since R&D can come up with new suggestions and solutions about how much should be paid for the article, these targets can change over time. But it was concluded that even though we are living and acting in a changing environment, the aim must still be to reach the targets so the criteria for effectiveness was agreed upon to be "Parts bought at zero cost GAP".

In summary we have the following result:

P = Show saving progress for bought material

Q = By using one common system for internal reporting

R = To achieve profitable growth

C = Purchasing Management, R&D Management, Product Planning, PAN Brand purchasing

A = Buyers, Managers, Cost Estimators, TVM, R&D, MP&L, R&D & Purchasing Finance

T = Show saving progress for bought material

W = Electrical Purchasing

O = PAN Brand Board of Directors

E = Purchasing head count, PAN brand sourcing decisions, raw material, exchange rates, Turnover, Volumes, D&D

E1 = Report correct savings

E2 = No administrative work spent on verifying results

E3 = Parts bought at zero cost GAP

4.4.6 Creating the Root Definition RD

After having laid a solid foundation for the Root Definition (RD) in the earlier stages and having a limited amount of time I started off making a suggestion for a RD to be able to present it to the group and then modify it accordingly to their wishes to make the most of the time available for the workshop.

The suggestion was:

One common system owned by PAN Brand Board of Directors, showing the saving progress at VCC purchasing for Purchasing managers, PAN Brand, R&D Management & Product Planning, staffed by skilled VCC purchasing employees, working within VCC purchasing in order to contribute to the long-term profitability of VCC, by being able to show correct savings regardless of internal or external environmental constraints.

The transformation was:

The first thing that was objected to was the PAN Brand as owners of the system. This was instead changed to VCC, which was regarded as a more appropriate owner. Where the saving progress is showed was changed from VCC purchasing to VCC, since R&D takes part in this result but is not a part of the purchasing department.

“... We are not really showing that (saving progress) at VCC purchasing, that should really be at VCC, it's both R&D and us...”

Naturally this concludes that we should keep R&D management as well as purchasing management as the report receivers, but should remove PAN Brand since this was agreed upon earlier. Product planning was exchanged by Price management due to the simple fact that there was some uncertainty about what department sets the price. This was only a correction as the following quotation shows:

“Buyer 1: Is it product planning that sets the price?”

Buyer 3: It's the price groups, although that's not product planning...

Buyer 2: What we logically discussed at the time was the bill of materials for the cars is decisive the whoever is going to sell the product and put together what we are going to sell...so what we meant was that this might be product planning or the marketing department or something...

Buyer 1: Anyway, the ones who sets the price for the car is the ones we are referring to... “

The next change was to specify which VCC employees that will staff the system since it was concluded that the general definition of VCC employees could be pretty much anyone and didn't really say all that much. So the decision was made to specify that finance, purchasing and R&D employees was going to staff the system.

“Buyer 3: Is it only VCC purchasing employees?”

Buyer1: Not really...

Buyer 1: ... It's also R&D and everyone...”

The last change was in the phrasing of “working within” which was concluded to be exchanged by “functioning” to keep it short and simple which is important when expressing the root definition. Furthermore the decision was made that the system should be able to work across departments and this decision made it necessary to change that the systems should be functioning in VCC instead of just VCC purchasing department.

“Buyer 1: One system working across all departments in order to contribute to long-term ...the system working across departments or something like that

Practitioner: Perhaps we can just say functioning to keep it shorter?

Buyer 4: Yeah, functioning...”

“Practitioner: Did we make any changes in the RD that affects the CATWOE that we haven’t changed?

Buyer1: Product planning has to be changed... to the ones who calculate the price”

The resulting RD was:

One common system owned by VCC Board of Directors, showing the saving progress at VCC for Purchasing managers, R&D Management & Price Management, staffed by skilled VCC employees within finance, purchasing and R&D. Functioning within VCC in order to contribute to the long-term profitability of VCC, by being able to show correct savings regardless of internal or external environmental constraints.

4.4.7 Creating a basis for the root definition

The discussion:

After starting out with the discussion and getting everyone on the same page in regards to what we were trying to achieve with this exercise the result started to shape form. Currently one issue is when there is a part number change you would want to be able to track that somehow in the system to get the right information. Currently this is done backwards, the financing department finds out that the numbers does not add up and then get the help of the purchasers to track the numbers down with some detective work to see where the problem lies. If this could be done in a correct way there would be a lot to gain and therefore technical changes such as a part number change has to be included.

“Buyer 2: ...The normal thing that happens is that we have some sort of part number change and ... then you have to track this one way or the other to get the right information out of the system like this, and maybe that is an activity...nowadays I would say, we try to do this afterwards, to do the tracking, the finance guys don’t get it right and then we try to track it backwards...then it would be a lot to gain.”

“Buyer 3: It could be technical changes?

Buyer 4: Technical changes, yeah, whether it will be a new part...technical changes is probably best”

Since technical changes are included in the root definition, it also comes quite natural that commercial changes should be included, since they are so important, if not the most important figures that gets reported. Raw material prices have become an increasingly important cost in the car making business as a car is such a raw material dependent product and also because of increasing raw material prices globally lately. One current issue is the inability to sort out capitalized D&D changes from the product price. D&D stands for Design and development (charge) and is an added cost placed upon each article bought from a supplier. The reason for this is that the supplier has been involved in the design and development of this part, and instead of paying the supplier a fixed sum for design & development expenses an extra charge is put upon each article bought. Currently there is no support in the reporting tools to sort out the D&D charges from the article price, hence capitalized D&D changes must concern the thing which gets transformed.

“Buyer 2: Commercial changes, technical changes and raw material changes, that is Buyer 3: and D&D!”

“Buyer 3: Raw material price changes, raw material changes... capitalized D&D... Buyer 2: If you cancel the program you will have to pay in the rest of the variance I would say

Since the supplier base is global and the VCC base is in Sweden where the Swedish krona is used, while FMC is based in America where the US dollar is used, which is also a very big market for VCC, currency fluctuations plays a big part in the reporting and has to be included in the list.

Currency fluctuations play a big role in reporting and have to be included in the list. This is due to that VCC is based in Sweden where the Swedish krona is used. But many cars are sold and shipped to USA where the US dollar is used and VCC is also owned by FMC that is an American company. VCC also has a global supplier base where for example euro is used.

“Practitioner: Currencies perhaps?”

Buyer 3, 4: Yeah

Buyer 2: But should we change supplier negotiation to commercial change? Commercial changes

Practitioner: What, where?

Buyer 2: First, commercial changes, because if you do the supplier negotiation you take it, all of it, you do the negotiation on all areas I would say”

Then the question arises if commercial changes included volume changes since this affects the turnover but not the detail price. This distinction was concluded to be a good reason for writing down manufacturing volumes as a separate entity so it would not be lost under commercial changes.

“Buyer 3: Commercial includes volume changes, or? Volumes doesn't affect the detail price but it affects our turn-over when we get higher?”

Buyer 2: Perhaps we should add manufacturing volumes?”

Buyer 3: Yes...”

No one objected to the statement that to enter a new price must be the activity that does the transforming. Optimally it would be sufficient to enter the new price in the system and then the system would store this information and update all figures attached to this price change automatically. This automation would make it very easy to generate reports. One could probably argue that the thing that does the transforming is when you are requesting the system to make a report. This really depends on how the system is technically built, if the figures are updated instantly, or in some kind of batch processing or as soon as anyone requests a report. Anyhow, one way has to be chosen and enter new price details is really what starts a change process no matter from what view you look at the problem and therefore was considered to be the most accurate choice.

Buyer 1: Wish do the transforming...we start something when we input the price

What happens after the transformation is complete is that finance takes part of the transformed artefact and reads it and compares it to their finance reports. R&D also reads it together with their PCR report. Hence it was concluded that these two reports should be the activities which are dealing with the transformed entity.

“Buyer 2: ...First activity is negotiate with the supplier, and the second step is that we enter it into the system, and as a third step the financing people try to get that verified by reading in the system, could that be something? To start with

Practitioner: Yes

Buyer 1: Isn't it enter new price in system and the next one is...finance reads it...R&D reads it in their PCR

Buyer 2: But that should be on the third one, shouldn't it?...

Buyer 2: And then dealing with the transformed entity that is what the finance people do.

Buyer 4: Yeah, because they generate the results.”

The result:

Those which concern the thing which gets transformed:

Commercial changes, technical changes, raw material price changes, capitalized D&D changes, currency fluctuations, manufacturing volumes

Those activities which do the transforming:

Enter new price and root cause (better historical tracking part nr. Change)

Any activities concerned with dealing with the transformed entity:

PCR report, Finance reports

4.5 Conceptual models

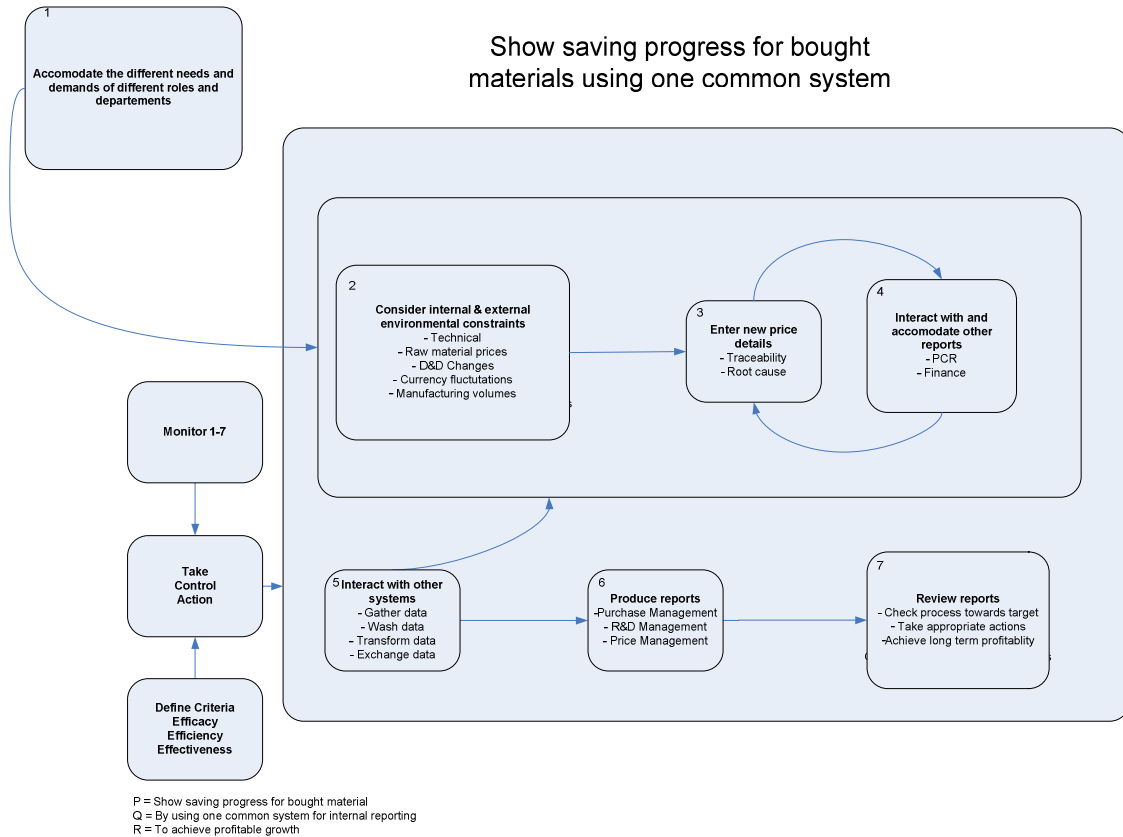


Figure 11 Conceptual model 1

After sharing the activity model and explaining every step of the concept the model was thought to be accurate by the attending buyers.

After having completed the activity model it was only one final step left, to discuss the information needs for this model, which is summarised in a chart matrix. To get the discussions rolling as quickly as possible a few suggestions was made for matrix to base the discussions upon. This matrix is showed below in table 3.

Activities from the model	How the activity is done	Measure of Performance	Information needed	Information support provided by	Information GAP's and opportunities
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Consider internal & external environmental constraints	Buyer inputs new affecting figures into the system	Influencing figures is applied in a way that makes a historical traceability possible	Technical Changes, Raw material prices, D&D changes, Currency fluctuations, Manufacturing volumes	TVM	?
Enter new price details	Gather data from agreements and other systems	Availability/ Correctness of data	VCC systems buyers	Purchasing Buyers	Measurability of data
Interact and accommodate other reports	Exchange data with other reports	Data is exchanged correctly and	PCR, Finance	TVM, Finance	
Produce Reports	Calculate base data	Presenting the numbers in an appropriate way for the receiver	Data from buyers and VCC systems	Strategy & Process Leadership	Reliability and correctness of base data
Interact with other systems	The system exchanges data with other systems	The right data is received in a timely manner	PCR, Finance	TVM, Finance	
Review Reports	Management reviews reports	Long term profitability is achieved, management receives the right figures presented in a appropriate way			

Table 3 The starting point

The discussion:

Consider internal & external environmental constraints:

The suggestion was “buyer inputs new affecting figures into the system” but this statement was extended to “buyer inputs new affecting figures into the system before management approval”. This is important because the new figures do not become active until they are approved by management, so in the system these new figures are invisible until they have been approved. This is also necessary to comply with SOX¹⁰⁹ regulations.

“Buyer 3: ... it doesn’t matter whether it’s going up or down, it still needs approval.

Practitioner: Yeah, so basically then I think we can write “Buyer inputs new affecting figures into the system before management approval” Even if you get management approval before you type in the figures then it has to be approved again

Buyer 2: Yes”

The measure of performance was extended from “Influencing figures are applied in a way that makes a historical traceability possible” to “Influencing figures is applied in a way that makes a historical traceability possible by establishing working relationships between part numbers”. The lack of working relationships between part numbers is currently a big issue. For example if there is a technical change in a certain part, the updated part receives a new unique part number. This is good because you can tell the new part from the old part, but it’s not good because the new part loses traceability with the old part even though the part has exactly the same function as before. For example one possible scenario is a new regulation stating that chromium6 is to be removed as a substance in certain materials. Since this is a technical change the new nut receives a new part number to tell them apart but it is still a nut used in the same way as before. This makes a gap in the historical cost savings that the buyer has to link together by going back in the engineering system and check the change order after having located the PCR¹¹⁰.

“Practitioner: So its detectivity work for the buyer then

Buyer 3: Yeah, which isn’t the best actually when you got people changing all the time.

Because I don’t know people file things in different ways, things aren’t recorded in a proper manner and so on and so forth, it gets lost!”

For example if 30% was saved on the nut, the next report will show 0% because the part number was changed, or if material costs were added 5% its suddenly 0%. So in terms of commercial reductions and losses it’s lost completely.

This issue has been addressed by adding a suffix in the end of the part number like “A”, “AB” etc. This helps the buyer somewhat, but if for example the thread were to be changed in the same nut which makes it unusable for old vehicles, a new part number would still be created and all traceability would be lost.

VCC uses unique random part numbers, probably due to some historical decision long ago to just give them unique identifiers.

In FMC as a whole, the part numbers are built up in parts, one part of the number defines the program, one the launch year and a third which brand is responsible for it, so there is logic behind the part number series. So in the case of the nuts above they would all have a similar

¹⁰⁹ http://en.wikipedia.org/wiki/Sarbanes-Oxley_Act/

¹¹⁰ Product Change Request

number as long as they are used in the same program and only the suffix would change. Thus you can quite easily track the nut over its lifetime.

This can become somewhat complicated since the brands use shared platforms for the different cars. So in the EUCD platform there might be three part numbers for the same part. One developed for FMC, one for Jaguar/Land Rover and one for VCC.

This is a scenario that can happen at VCC, if for example some of the old P2 platform parts are used in the new EUCD platform. In the VCC systems you use the old P2 number but also a new part number for the EUCD platform, so if the buyer would like to find out how many parts per vehicle are being used she suddenly needs to track down two numbers.

It doesn't have to be that one part number becomes another part number, it could also be that one part number becomes three part numbers with a third of the volume to further complicate the issue.

“Buyer 2: That will normally happen, because what happens for the buyer is that, ops, a new part number, ops, it comes a new part number, what is this you wonder and try to get a price of it hence there is nowhere in the system, in SI+, when it comes a new part number its just like that, there is no connection to the historical, to the history in any way.

...

Practitioner: But basically everything comes down to that there is no working relationship between the part numbers.

Buyer 2: Not that it's easy accessible by SI+. There is of course tracking in the change order.”

Most of the entities for information needed were defined during the exercise of defining the activity model. However where the information support were to be found is still to be defined. Starting off with technical changes, the buyer needs a PCR quote one page in order to commence with the required changes within the system.

Not to be confused with the PCR report, the product change request or VCC concern is a different process.

The PCR process is a process created by VCC to be used when a part change is being executed. This is a document containing timing, costs and approval. The reason for naming the PCR process “VCC concern” instead of just calling it the PCR process is that it is somewhat based on FMC's process, when you want to change a part you are concerned about it, so at FMC it is simply called “Concern”. To create a distinction between the two the VCC's process is then called VCC concern. An engineer can look at this Concern and make a decision if it needs to be changed or even if it's better to create a new part. When this Concern is created, a unique number is attached to it. To get it approved two documents are needed, the first one is called a Support Plan and the second one is a Quote One Page. The Support Plan is about timing, instructions and quality and the Quote One Page contains costs and volumes. These documents have to be approved in separate forums. In general the Quote one page is the document that concerns the buyer and contains the information she needs to perform the necessary changes in the SI+ system. In some commodities a set of PCR's is taken and put together to create a Quote one page.

Input support regarding raw material comes partly from R&D engineers, which specify the raw material used in the component and the material price, but also from the suppliers if they notice a change in raw material market costs.

To get this confirmed is the buyers' responsibility, this is easily done through London Metal Exchange and then the case is presented to an instance called Directors board of raw materials.

*“Buyer 3: The information is supported by R&D and the supplier isn’t it?
Buyer 2: Yes, R&D and supplier”*

The D&D capitalization changes come from agreements between R&D, purchasing and the supplier of the part. The buyers were not completely sure about the connection, but when there is a job split and a statement of work the assumption was that it requires some sort of an engineering budget from the supplier and that these resources needed were connected to the price sum. But information of this connection is not specified in the CPA's (Commercial Program Agreements).

Information support for currency fluctuations is provided to the purchasers by a document called PVD. This document is received every month and contains a 24 month forecast of the production volumes, so the currency information is not its main purpose. It is an information source when reporting in the Business plan but for the Commodity business plan a long range plan is used that forecasts future volumes until 2015.

However these documents contain forecasts to help the buyers estimate, but the true volumes that are really being used in the production are available in the SI+ system and these are of course used when finishing the BP and CBP and sending them to their receivers. How the true volumes ended up in SI+ was unknown to the buyers but the only logical answer is that it must have come from manufacturing somehow.

“Practitioner: And those true volumes I guess must be from...”

Buyer 3: You can see it in SI+ but where they come from I am not sure, it must be some kind of link to the manufacturing system in SI+ but that’s when you need to get the process map for the system to show that.”

Moving on to the GAP's and opportunities we can find some very useful information. The buyers found themselves unable to understand how finance calculates their commercial results and would greatly appreciate if finance was able to supply an algorithm showing how this is done.

Buyer 2: To point out the really weak point finance has to provide... algorithm for how they are calculating the commercial result... not defines, more like states an algorithm for the financial report.

As we have mentioned before there is a problem with the historical tracking when the part number changes create gaps. This is not only a problem with this issue, but it was also thought to be an opportunity to increase the historical tracking to make better forecasts. In addition, as explained above it would be helpful for the buyer to be able to separate the D&D capitalization charge from the part price for the above mentioned reasons.

“Practitioner: Should we include something more here under GAP’s and opportunities?”

Buyer 3: Historical tracking of part numbers, I would also put changes in there. It can be useful to know, especially for the reports. Tracking correctly the process to see which date it was changed and from that figure out which PCR it was and what the PCR's would cost and so on and so forth.

Buyer 2: It should be, when it comes to capitalization, we should be able to directly see in SI+ the capitalization part or the buy. We should have it separated somehow...

Buyer 2: And then it comes to manufacturing volumes

Buyer 3: That's not to easy is it because it depends on the supplier and the situation, because some suppliers go, okay they got a volume increase, let them have it...but other ones go, wait, we need to get something back for that."

Enter new price details

The buyers suggested to remove systems from "Gather data from agreements and other systems" since data was gathered from agreements only. Otherwise the proposed entities for the whole row were thought to be correct.

*"Buyer 3: It comes from agreements, isn't it? Gather data from agreements
Practitioner: Then we can toss this part"*

The measure of performance was quite naturally that the data entered is correct and also the easy access of data so the data can be updated in the system with a minimum use of resources. The information needed is the new price details that the buyer has negotiated and agreed upon with the supplier as well as the help of VCC's systems to gather the information necessary for a successful negotiation.

This information support is provided by the buyer himself who has all the necessary information after the negotiation is complete.

An opportunity here is to increase the measurability of the data with a system that improves the reporting procedure.

Interact and accommodate other reports

The buyers expressed a concern about the phrasing "Exchange data with other reports" and emphasised that its important to gather the data at the data source to avoid redundancy and faulty data, and to a large extent also reduce the processing times since the data can be gathered directly at the source preferably from some kind of database. .

It was also thought to be necessary for the system to be able to analyze the gathered data to format it in the correct way necessary to produce the report correctly.

"Buyer 2: From the next line there, interact and accommodate other reports. I am a bit against this, if you are using a database here with a lot of data and pulling out the reports of that. And if you need something to make another report, maybe you need from that database and you need the data but you shouldn't use that report, you should use the database to get that data"

The measure of performance for this activity is that the data is exchanged correctly so it does not become corrupted along the way, which could be a possible scenario since exchanges of data between systems that do not share a common architecture can easily lead to problems. If this is done correctly we will be able to do the necessary reporting while avoiding redundancy and second hand data sources when using a shared platform for the base data.

"Buyer 2: ... When I do manual reports in Excel... I try to work in a way that I double check my result by calculating it in two different ways... there should be built in some kind of checkpoints in the system.

Practitioner: ...If those checkpoints are made correctly by the system engineers team then the data will be exchanged correctly and reported and avoid redundancy..."

To understand the defined entities under “Information needed”, one has to understand the relationships between the reports. The suggestion that the information needed should come from TVM was discarded by the buyer. The buyer explained that PCR and finance are the ones that need the new figures reported by the buyers. When they are conducting their reporting they have to use the buyers’ data and a bit of data from other systems. The buyers’ contribute with data about what the purchasing department is doing. So from this perspective it’s a support to finance and PCR to conduct their reporting. So in a more practical sense they can see that purchasing has delivered their numbers, and then see that manufacturing has delivered theirs and a few others as well and then feel confident in commencing with their own reporting work. The finance report feeds the PCR report in the sense that what is a commercial change gets verified in the finance report when conducting the PCR report. So the information needed to carry out “interact and accommodate other reports” is the finance and PCR report, although it depends a little bit on how you define information needed. If you take the perspective of the system, it is really just providing PCR and finance with of all of purchasing’s figures. But in the perspective of “interact and accommodate other reports” the information needs of PCR and finance must be known to make this function work.

To express these information needs for the PCR and finance report, TVM and finance has to provide information support to accommodate their needs.

“Buyer: ... Yes, purchasing has delivered their numbers now, and then they need to look into other systems to look at manufacturing and a few others and then see that we got the green light from them as well when they have delivered... and now we can make our report.”

During the workshop some information gaps and opportunities also arose. The first issue that arose was the discrepancy between reports. When purchasing puts together their figures and report them, they correlate quite well with the PCR report, but when this is compared to the finance report it doesn’t match very well anymore, the difference between figures in the two reports are simply too big. Sometimes the buyers report is the correct one, but it could also be the other way around, that finance has the accurate figures, or at least the most accurate. It can be a big uncertainty which report is the most correct one.

Hopefully this can be solved if finance specifies an algorithm for how they create their report, enabling the buyers to understand how the finance report is created and enable them to work together with finance to track down the missing link in the reports and pinpoint the incorrect figures.

Since the reporting to some extent is done from VCC to FMC, it can be useful to know that there is a somewhat different approach to reporting between VCC and FMC. When FMC reports cost savings, they always specify from what date the cost savings take effect, whereas in VCC it is noted mostly to have everything in order with the supplier. For example, if a cost saving of 3.5% is effective from 1/6 with a turnover of 100% valued at 100 MSEK, then 3.5% of that is 3.5 MSEK. However, since it won’t be in effect until the 1/6, the cost saving that calendar year will only be 1.75 MSEK. It can also be that FMC makes the decision not to have a cost reduction in the article price at all, but instead the supplier deposits 1.75 MSEK as a cash back or refund. Then FMC have reached their cost savings goals given a goal of 1.75 MSEK, without making any reductions in the part price in the system and the negotiation becomes more of a yearly negotiation.

So while VCC has the focus and goals set upon making reductions in the part price, FMC has their focus set on the actual net savings.

This of course affects the way negotiations are conducted since if you make a reduction of 5% valid in December one year, it will hopefully give you a good price for the whole next year, but the cost savings that year will be zero and for the year it goes into effect you have paid 5% more for the remaining 11 months.

Produce Reports

How a report is done is pretty simple to define, it is of course calculate the base data that has been stored by the buyers so it is presented in the way the report was intended to function. The measure of performance for this naturally is that the numbers are presented in an appropriate way to the receiver so the report has the impact it was set out to have and hence function in the way it is intended.

The information needed to write the report is of course that the data necessary has been collected from the buyers and the different VCC systems.

Manufacturing has to provide information support because the take rate, volumes etc. have to be included somehow. To exemplify this looking at FMC's way of calculating, we might on one commodity have bought for 50 MSEK and then reduced the price by 10%, but the take-rate increased and the parts were not mounted upon 10% of the vehicles that goes into production, as we earlier assumed, but on 25%. The reason for this could be skilled salesmen or that increased popularity of this feature made it happen. Thus we have now lowered the price by 10%, but at the same time we have bought material for 100 MSEK instead of 50 MSEK. This means that we have increased our expenses in monetary units for the commodity. Then one has to ask oneself if that is a good or a bad thing. It is good, in the sense that this is a feature that the customer would like to have and VCC is able to provide, but it is bad in the sense that the buyers are not meeting their monetary targets in regard to cost reductions for the commodity.

Manufacturing also has to supply information about "ratios", which is cost savings that's based on taking different sort of measures to make a more rational assembly of the part. The R&D VCC concern is also included, because if R&D introduces a technical change and the prices are increased, it is important for the buyers to know this and include it in the report. So all these factors have to be accommodated and included when producing the reports to be able to give a fair picture of the reality of circumstances.

The first information opportunity is almost evident, to have reliable and correct data. This is of course essential to effective reporting.

One part of being able to have this and give a fair picture of the reality as we have mention before is to monitor the feature growth in the produced vehicles to be able to sort out an underlying trend.

*"Buyer: ... Somehow I think what is demanded many times is some sort of monitoring upon this... feature increases... well, you would think that the material bill would be the same if you did not negotiate the price or make any cost "ratios" or quality changes. But the reality is that the cars get more and more expensive because if you want to compete on the market you have to include new features... The car becomes more and more expensive, and somehow it would be great to have some sort of monitoring of feature growth upon that to relate to.
Practitioner: To sort out some sort of underlying trend"*

The buyer's understanding was that R&D probably has some sort of method of doing this when they are conducting their PCR report, but how this method works was unknown to the buyer. Since this method was unknown the buyer emphasised that the responsible for the

finance and PCR report would have a lot to benefit from increased cooperation with purchasing.

This led to the information opportunity to create a common platform for exchanging needs and possible improvement suggestions between the responsible for the purchasing, finance and PCR reports.

*“Practitioner: Needs... and possible improvement...finance... product development, who should really be included here? Finance? The PCR people? Are they called TVM?
Buyer: No really, I think you can write PCR responsible’s, product cost report...”*

Interact with other systems

To carry out this activity is naturally that the system exchanges data with other systems. The initial thought was to be able to exchange data with the purchasing system, so that the buyers won't have to type in data twice and thus save time and get the reports done quicker, more agile and decrease the risk of errors being made.

The measure of performance for this activity must then be that the right data is received, so the right figures are reported giving fewer errors and that the data is received in a timely manner. The reporting system doesn't have to receive the data in real time, just that it won't take an unnecessary amount of time.

PCR and finance will need the information that is retrieved from the purchasing system (SI+). To be able to do this finance as well as manufacturing needs to provide information support. We knew that there were two manufacturing systems, Pecca and Mecca but were not sure about the distinction between them. Nevertheless, the understanding was that within those systems you would be able to get data about what is actually produced in the factory and to what costs etc.

Since the knowledge of these systems wasn't great, the decision was made to put them under “information GAP's and opportunities”.

“Buyer: Maybe you should write manufacturing, Pecca and Mecca. But we are really talking about the same thing in different places here in this column, here in the top we say “manufacturing volumes” then “volumes take rate etc.” then “Pecca, Mecca” and what I am really saying is the same thing all the way through the column here, there is quite a bit of useful information to be gathered here.”

Review reports

Since all reporting is made for management to act upon, the activity “review reports” should be defined as “Management reviews reports”.

The measure of performance, and also the goal of reporting is that the figures reported are used to drive the business forward and achieve profitability. It is also important that the figures are up to date so that management is able to act upon correct information. To support management in their review it is also important that the figures are presented in an appropriate way to avoid misunderstandings and waste time on sorting out what is really important.

These measures of performance was defined as “Long term profitability is achieved, management receives reliable correct figures presented in an appropriate way in time”

The information needed to carry out this activity is “Gathered data”. And that is all the data that has been gathered in the previous activities and then been sorted and summarised to produce the report that is subject to management review.

"Buyer:... The report has to be up too date, maybe that should be included somehow, no, skip that, it's to complicated

Practitioner: We kind of have that covered in reliable correct figures

Buyer: I mean, like when the big stock market companies present their annual report it's about one month after the period it represents and well then it's a little too late."

Information support should be provided by no one. The point of this is that all the data that is needed should have been gathered in the previous activities and you should not need any information support from anyone. If there is something in the report that for some reason someone wants to track down and look further upon, it shouldn't be difficult to login to the system and verify where it comes from without having to involve lots of people to do this simple task.

"Buyer: Really, if you use a database in the bottom (information layer) that is user friendly, then its easy for whoever needs it to login and verify where it comes from... in whatever system it might be. It shouldn't be necessary to have three guys around you to tell you what has happened. It should be within the systems.

Practitioner: A measure of performance here is really information support provided by no-one...that should be the optimal.

Buyer: Yes, it has to be that"

One opportunity here must be to automate processes by collecting data at one reliable source, thus saving valuable time that could be used to pursue other activities that adds value to the company and improve the reliability of the data when a common source is used.

"Buyer: Enables, can spend more time on commercial issues...

Buyer: On commercial issues! Or commercial work perhaps, issues is more...

Practitioner: Work while...perhaps something more, reliable, reliability of data"

Furthermore, by improving the reporting we have the opportunity to improve management's abilities to use the reports as a tool to make the right decisions about how to manage the department when acting upon the figures presented in the reports.

"Practitioner: An opportunity here is perhaps to give management the right tools with these reports to be able to act in the basis of what is identified in the reports... Provide data for...decision making, can you say that? Taking perhaps

Buyer: Gather data to take decisions is perhaps better"

Another opportunity when having a common data layer is to improve the traceability within the system and thus enable management to easily get to the bottom of a possible issue quick and accurate.

"Practitioner: Another thing is, if you collect data like this in a central hub to avoid redundancy, there should also be a point in having traceability in the data, for example if management says "well, it says a million something here, where did that come from? This looks suspicious!". To easy be able to go back in the system and locate the origin of the numbers.

Buyer: Improve traceability!"

Improved traceability also supports the accountants when performing an audit to easily be able to locate what is what in a system and gather all the necessary figures for their work. At the same time we have the opportunity to improve the accuracy and reliability at the data source enabling the accountants to feel confident in their audits.

The result:

Activities from The model	How the activity is done	Measure of Performance	Information Needed	Information support provided by	Information GAP's and opportunities
Consider internal & External Environmental constraints	Buyer inputs new affecting figures into the system before management approval	Influencing figures are applied in a way that makes a historical traceability possible by establishing working relationships between part numbers	Technical Changes , Raw material prices, capitalization changes, Currency fluctuations, Manufacturing volumes	VCC concern (Technical Changes), R&D and suppliers (raw material), CPA (capitalization changes), Unknown (currency), Manufacturing (Manufacturing volumes)	Finance states an algorithm for the financial report Establish relationships between part numbers to enable historical tracking and changes of part numbers Separate the D&D charge from the part price
Enter new price details	Gather data from agreements	Availability/ Correctness of data	VCC systems buyers	Purchasing Buyers	Measurability of data
Interact and accommodate other reports	Exchange and analyze gathered data from reports data sources	Data is exchanged correctly and reported and redundancy is avoided	PCR, Finance	TVM, Finance	Discrepancy between purchasing and finance reports Finance states an algorithm for the financial report
Produce Reports	Calculate base data	Presenting the numbers in an appropriate way for the receiver	Data from buyers and VCC systems	Buyers, Manufacturing (volumes, take rate etc), R&D VCC concern	Reliability and correctness of base data Monitoring of feature growth

					Creating a common platform for exchanging needs and possible improvements for finance and PCR report responsible's
Interact with other systems	The system exchanges data with other systems	The right data is received in a timely manner	PCR, Finance	Finance, Manufacturing	(Pecca, Mecca)
Review Reports	Management reviews reports	Long term profitability is achieved, management receives reliable correct figures presented in an appropriate way on time	Gathered data	None	Enables employees to spend more time on commercial work while improving reliability of data Giving management the right data to take decisions Improved traceability Making audits more efficient

Table 4 The result

Summing up on all the work:

Since not everyone could attend all the workshops I thought it was important to have one final workshop to give everyone a chance to look at the end result and leave suggestions for possible changes. And also the ones who have attended when certain parts were created will be able to benefit from having a second look at the work and reflect upon what was created and if something could possibly be done different. Buyer 1 was forced to join the meeting 30

minutes late, but got a chance to review everything that was discussed before the meeting came to an end.

The first change was that I, the practitioner, suggested some changes in the relationships between the entities in the activity model. First I suggested that the relationship going back from “Interact with and accommodate other reports” to “enter new price details” was to be removed. This decision was based upon the idea that no information should need to be transferred from other reports and used when typing in new price details. It should be sufficient to store all the data from the other reports in the common data layer and the system will have built in functionality to accommodate and interact with the other reports without involving the buyer at the “enter new price details” activity.

“Practitioner:… This was the old activity model that we agreed upon, but after I looked a little bit further on it by myself I thought we might make some minor adjustments here. Basically the suggestions that I suggested is first of all to make one relationship here in one way, because with the “interact and accommodate other reports” we have this common data layer, we shouldn’t really need to have anything going back from those reports, it should be just in one layer, so basically when we put it there we shouldn’t need to make any adjustments with it, but that’s just a suggestion, if you agree with that?”

Buyer 2: Yeah, that’s fine”

The next change was to add a relationship from the entity of our system that contains entities 2, 3 and 4 so it is a relationship both back and forth from and to the “interact with other systems” entity. This is based upon that we need to exchange data with other systems, not just retrieve data, this is important to avoid redundancy and keeping the integrity of our common data layer.

“Practitioner: And also the relationships here, before I only had one relationship going this way and this whole lot was supposed to be the embedded system, and I thought when I looked a little bit further that interact with other systems should exchange, we shouldn’t only receive data from other systems, of course we should exchange in both ways, so that’s the adjustments that I made

Buyer 2: Ok”

In the old model we have a relationship going from the “interact with other systems” entity to “produce reports”. This was considered wrong because it is our system that produces the reports, not “interact with other systems” even though we might need to perform that activity to produce the reports. So the relationship going from “interact with other systems” was moved to go from our reporting system to the “produce reports” entity.

“Practitioner: And also… Here I made only one relationship going this (way), “interact with other systems” and then “produce reports” and then “review reports” and I thought we shouldn’t need to interact with other systems just to product reports, it should come directly from the system so I made a line directly from the system

Buyer 2: Okay”

Further more a suggestion was made to add “Monitoring of take-rate” to the produce reports entity under “information gaps and opportunities” in the information needs matrix.

This suggestion was based upon the thought that if the buyers could access information about the take-rate it could be very useful when negotiating with the supplier. If the take-rate turns out to be higher than the numbers presented in the agreements between VCC and the supplier this can be a good argument to get a volume discount.

“Buyer 3: Especially for yearly negotiations so you can check if the take rate is higher than what we have in our agreements, if it is higher it is very useful in a negotiation.

Buyer 1: All data is already there

Buyer 3: It is just a matter of retrieving it in the right manner, in a structured manner.

Buyer 1: I mean, I can imagine that there is a few established reports... you want to be able to choose a timeframe yourself and gather instead of being informed that during 2008 there has been a 9% take rate on this item, the curve could have gone like this, how did it look after the AT for example? Did it go up or down or what happened? I think that would be interesting analyze that kind of numbers for the purchasing department.”

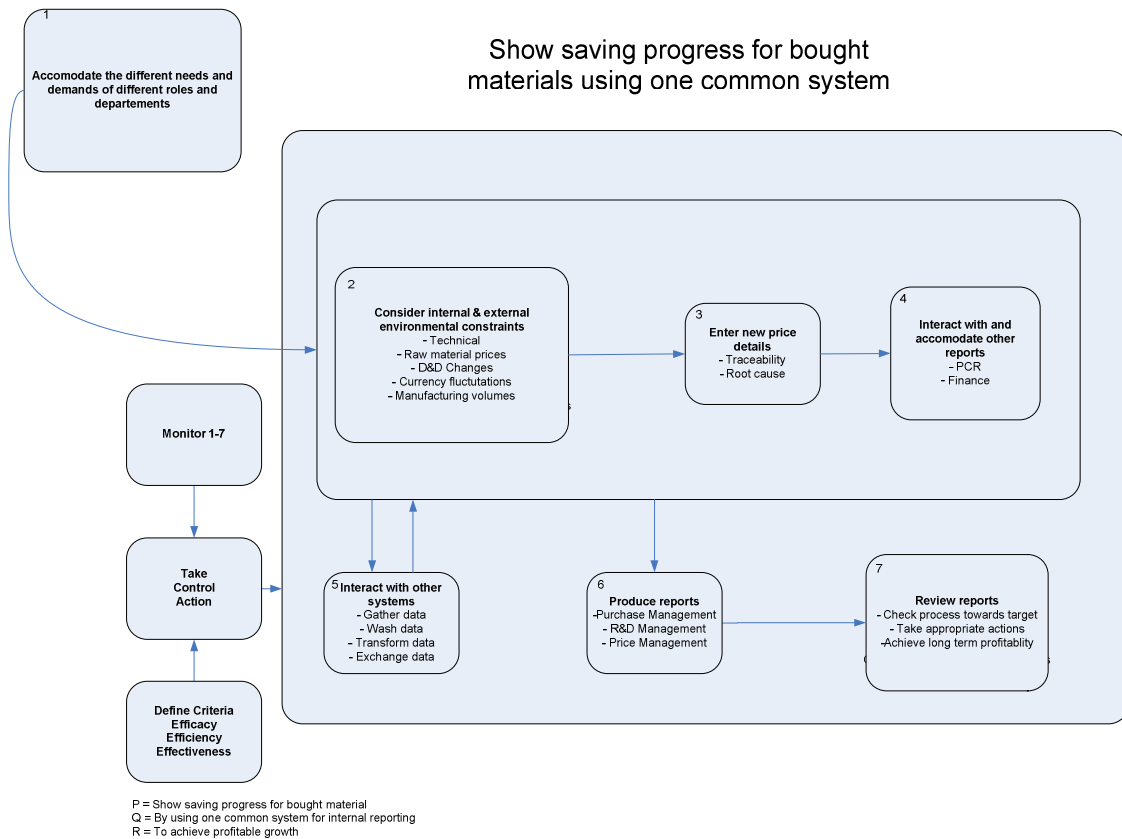


Figure 12 Conceptual model 2 - Final

5. Discussion

5.1 The next step – Room for improvement

Problem: - Buyers find themselves unable to understand how the finance report is calculated

Solution: - Finance states an algorithm for how the finance report is calculated

Problem: - When new part numbers are created traceability is lost in system
Solution: - Establish a working relationship between part numbers

Problem: - Discrepancy between purchasing and finance report
Solution: - Create one common system for reporting with traceability making it easy to pinpoint incorrect figures

Problem: - Current reporting lacks monitoring of feature growth
Solution: - Establish a dialogue with the PCR responsible's from R&D to find out how this is done in the PCR report

Problem: Current reporting lacks working relationships between different reports making redundant data possible
Solution: Create one common system and data layer for reporting with error-checking supporting the buyers from making unnecessary mistakes.

Problem: Calculation of numbers is to a big extent done manually in spreadsheets and the same calculation is done in many reports
Solution: Create one common reporting system and data layer making it easy to retrieve reliable data and automate necessary calculations thus reducing time spent on reporting that could be spent on commercial work.

Problem: Possibility of making decisions regarding cost-splits that doesn't make economic sense for VCC but does for the individual departments.
Solution: Embrace the company philosophy of "We" and create a common platform for exchanging needs and possible improvements between R&D, finance and purchasing to find a solution.

Problem: D&D capitalization cannot be separated from the article price
Solution: Enable the buyers to separate the D&D capitalization from the article price

5.2 Using SSM as a method to deal with the VCC case

Since the identified problem area has not yet been dealt with, just documented in this essay, it is impossible to discuss the impact the suggested actions to improve the situation would have. If actions were taken to address the situation it would also lead to the possibility of studying if these actions were based on the findings of using SSM and if they were, what kind of impact they would have in the organization. Since this is an essay with a timeframe this can at the moment only be a suggestion for further studies.

However it is possible to discuss how well SSM turned out on the VCC case documented in this essay before taking any actions to deal with the situation at hand.

5.3 Trying to grasp the case with SSM

When starting working with a case like this, it is essential to understand the situation the problem lies within. This can be a quite complicated task, since everything is new and one have to try to put oneself in the situations of the clients to understand their daily work and how they operate in general. Furthermore it's necessary to start framing the area the problem lies within and sort out what seems to be relevant to the study and what seems to be irrelevant.

Here it is easy to get off track and swirl away in the wrong direction since the practitioner knows little about the clients work and the clients probably know even less about the practitioners work and how the methodology works, even if both has tried to explain their situation to each other with the best effort in mind. I was able to find a lot of help in the “rich picture” to constantly reflect upon and getting a good overview of the situation with a more holistic view. It is not only a great tool for the practitioner to keep everything sorted but also in discussion with a client to be able visualize each others perspectives and immediately being able to ask question such as "how does this relationship work?" or "Why is there no connection between these two occurrences?". Since the purchasing department is quite large and is also part of a big company, many people are often affected by the problem area creating a need to talk to different people with different roles.

Here I also found great help in the rich picture by being able to carry it with me between meetings to quickly show the new person what I currently knew and immediately being able to start off and complement the previous meeting with new inputs and perhaps corrections or different opinions about currently drawn entities. Not only does this give me a better understanding, but also helps the clients to understand each other, even though it is on a very basic level.

Even though the rich picture is very flexible, to say the least, it is hard to go wrong even with little experience of making them and general lack of artistic skills. I think that it is also important to know that the rich picture will probably reflect the person making them to a great extent since they are so creative. For me as a student of System Knowledge, I found myself having a little bit of trouble to let go of the UML type of way to organize the world and start embracing the more artistic and creative way of making a rich picture. My guess is if an art student would have done it, it would probably have come out in a very different way than a student with a background such as mine.

The literature by Checkland about SSM says a lot about the methodology and even shows some cases and how they turned out. However, there is very little mentioned about how to practically go about when using it. So basically it says how to draw a rich picture but not how to go about to gather what is necessary for it. Since Checkland emphasizes that it is an adaptive and iterative methodology there is of course no way that’s correct for all cases, rather that every case is unique, since it deals with people. Naturally this is a big strength for the methodology, but it also leaves a lot of responsibility to the inexperienced practitioner.

So for me as an inexperienced practitioner my experience is that I would probably benefit from a more thorough description of a case and how it was practically conducted and what problems and opportunities were encountered during the study. There is of course a risk of trying to copy the method more or less conscious and using a method that might not be suitable for the task at hand. This has to be weighted against the possibility of making the wrong decisions due to lack of experience.

However, all in all, the rich picture was a tremendous helpful tool in trying to grasp the case and starting out with the study. In my opinion I saved both a lot of time and also gained a much better understanding about the situation then I would probably have done just by having meetings and asking questions without the support of the rich picture.

5.4 Performing the analysis with SSM

Starting out with defining client, practitioner and owner was not a particular advanced task and there is really not so much to mention except that it is useful to define what is what and within which context the study is done. Even though it is a simple task it can be forgotten and it is always good to have it written down so it will not fall out of memory.

To carry out the social and political analysis Checkland recommends writing down findings such as informal leaders etc. after a meeting or alternatively create other activities to remember your findings. My opinion is that this is a quite personal perception and I didn't find anything worth to mention except that the buyers were engaged in the activities and that meetings were done in an easy going and open climate.

5.5 PQR

Starting out and making a solid foundation for the CATWOE and root definition, the PQR formula was used as recommended by SSM.

I think many people like me find it easy to start thinking many steps ahead and find solutions to problems that are not really thought through. It is easy to start contemplating over technical problems and possible solutions to them without sufficient knowledge of the problematic area. In this case for example, start to think about possible solutions to merge the different reporting spreadsheets into one system and the practical solutions to gather data from other systems. Then continue on with the thought if there could be a potential problem exporting data from this system and the possibility of solving this with some kind of XML transformation to easily move data from the reporting system back and forth to other systems and what systems that could potentially be. And suddenly before you know it you have started making lots of solutions to problems you don't really know even exist. So my opinion is that the PQR is a great method of thinking about what one really is trying to accomplish. Why am I thinking about these solutions? Perhaps I am just making a brilliant solution to a problem that should never even have existed.

The old Swedish saying "it is better to walk in the right direction rather than running in the wrong one" very much applies to this. Before we can focus on the details, a holistic view must be taken to ensure that we know what we are trying to accomplish.

Not only is it important for the practitioner to know what should be constructed system wise, but also for, in this case the buyers, to think about what they are really trying to accomplish with their reporting activities and hopefully also getting the opportunity to reflect over some of their tasks.

Furthermore, I think it is a great way not to reflect upon what we are trying to accomplish not only with the reporting system, but also to get everyone on the same page in regards to what we are trying to accomplish with our work and thus having a common foundation to stand upon when continuing our forthcoming work.

I think another strength of the PQR is that it is quite simple, it is not very difficult to explain how it works, the hard thing is to figure out the answers.

I believe one can save quite some time by not rushing into things and taking the time to do the PQR right from the beginning to minimize the risk of getting off on the wrong track. This can prove to be valuable when continuing with the other steps and wasting time doing them only to find out that everyone is heading in the wrong direction and then having to go back and start all over again, or at least redo parts of the work and check what can be salvaged.

5.6 CATWOE

After having defined the final PQR, or really what is thought to be the final PQR at that point, one has laid a foundation for carrying on with the CATWOE.

I found the CATWOE to be a great tool for crosschecking the PQR transformation for discrepancies against what was defined in the CATWOE and vice versa.

Since this is the first time performing a study such as this for me, it is hard to have anything to compare to, however when performing the CATWOE analysis I could not really find that I was missing out on anything important that wouldn't fit within the CATWOE. When using the latest book from Checkland on SSM, the previously used German word "weltanschauung" was replaced by the English "worldview". I think this was a wise move by Checkland and I decided to take up on this change when performing the study. Since the CATWOE is done together with the employees in the organisation, the CATWOE and the whole concept of SSM is totally new to the employees and is difficult enough to grasp as it is. On top of that having to explain why a German word suddenly pops up would probably confuse more than it clarifies.

The point of the CATWOE is really about defining the context that the system will be working within. I find it hard to believe that a system can be done correctly without the knowledge of what the context will be, provided that the system will be used by humans. So I can hardly see that there is any doubt that this is an important step for this case. The natural question is if the CATWOE was the right tool to handle this issue and I can not say that I felt like anything was left out.

5.7 Root Definition

When creating the root definition it took some time to get off to a good start. Since the RD is written quite freely, it can be difficult to choose how to formulate the sentences. To start off I looked at how Checkland had written a few RD for different cases explained in the book. Then I tried to pin down how Checkland used the PQR and the CATWOE in his RD and what parts of the PQR and the CATWOE were used where in the RD. After having established this, I did the same thing with this study's RD. I started out to put in the PQR and the CATWOE in the RD in the same way as Checkland had done to create conditions conducive to forming this study's RD. Of course this does not create any RD or readable material but it is easier to start forming ideas when everything is outlined where it possibly could be. Slowly I started trying to form the RD and trying out different sentences. After the RD in my opinion was completed it was presented in one of the workshops and had some minor changes so everyone was satisfied with it. Explaining the whole concept of the RD took a little effort, but I think that because the RD I made was based on the PQR and CATWOE that everyone already agreed upon and formulated together greatly helped to get everyone's understanding of how it was formulated as well as its intended purpose.

All in all there were not really any big problems, but a few tips and pointers in the literature to guide the practitioner through the creation process could probably be useful.

5.8 Activity Model

To get some practice with the activity models I started out trying to make a few models without going through the three activities recommended by Checkland when having difficulties. After making a few models that were either discarded or incomplete, I finally came up with one model that was thought to be an accurate description. However this was done before the PQR and CATWOE were completed and the root definition had been created and approved in the workshops with the buyers and hence was only based on my suggestions.

After completing these steps in the workshops and modifying my suggestions quite heavily, my activity model was no longer accurate or even remotely accurate so I had to obliterate it. Even though it was no longer valid, it was still useful for the study, partly because I got practice doing activity models but mostly to present an example in the workshop of how an activity model could look like in this case, even if it was not a correct one. Starting out creating a solid foundation for the activity model Checkland's three activities proved to be a great tool. Much effort was put in and long discussions were carried out to complete and discuss the entities chosen. Without having this tool I think we would have had quite large problems forming an equally good activity model or at least it would have taken considerable more time and frustration, since we would probably have had to redo the activity at least a few times before reaching the same result. Even with the entities pointed out under the three activities it is hard enough to start forming the activity model.

5.9 Information needs

Information needs is the final step in SSM and probably also the biggest and most time consuming in this case, but also perhaps the most interesting one. The first impression was that it took a lot of time just to complete one of the boxes in the matrix. Even though all the previous steps took at least twice the time to complete as one would expect, this took at least four times as much as one would think. You could perhaps see this as a disappointment, but I regard it as a strength of the method. Because if you use four times the time you originally would think coming up with answers to the defined statements in the chart matrix, you are probably up to something good. Looking back at the chart matrix and what was defined I must say I am very satisfied with the result. I find it hard to believe that we could have come anywhere close to this result without the help of the SSM framework.

Perhaps the hardest thing when performing this step is to take attention to details and discuss everything thoroughly, but at the same time keeping a holistic view of the task. What I mean by this is that you have to be able to discuss different matters and find out if they are relevant to the statements in the chart matrix that we are trying to answer. This can take some time because you have to explain to the other participants what you mean, and perhaps also explain how for example a certain process works if the other participants do not have the same knowledge about the process, or maybe not as deep knowledge about a certain part of the process. They might have knowledge about another part of the process and can together map out how it works and if it affects the study. In doing this it is very easy to get carried away and focus on different problems in that process or other problems that are important issues but perhaps not relevant for the study. This is a balance in taking the time to go through matters that might be important, but at the same time not wasting time and getting bogged down on irrelevant matters. In my opinion it is the practitioner's responsibility to interrupt with questions about if we are heading in the right direction. In my experience this is a craft skill and I found myself to gradually improve my skills in what questions to ask and when to ask them. So at the same time as you are focusing on the topic that is being discussed you need to keep a holistic view of the study in the back of your head at all times.

Luckily the buyers helped out with this and asked questions themselves and thus taking some of the responsibility off my shoulders.

As a general guideline I tried not to interrupt too early and tried to question if we are heading in the right direction rather than saying that we were not in my opinion, letting everyone have an opinion about it. The general guideline was that it was better to use some time discussing irrelevant issues rather than missing out on possible important information, since this will probably end up saving time in the long run.

Another thing that's always hard to balance is to keep everything realistic, but at the same time try to model the system that we are trying to define. This proved to be quite difficult from time to time, on one hand we need to model the system as we would like it to be, but at the same time we have to accommodate structures within the organizations since we cannot change how the whole organizations processes work just to make the system work perfectly. It is very hard to draw a good line between what structures the system needs to function within and what structures currently exist, just to accommodate the current way of working that we would like to leave behind us when the new system is created.

In one way we need to model how we want everything to be, but we also need to note different issues that are tied to the current processes, that might or will be an issue if and when we start to implement the new system.

5.10 Comparing SSM with competing frameworks

SSM is not the only possible way to approach this problematic area that's the subject of the study. The first question that could come to my mind is what if this study wasn't done, what would have happened?

Well, here I do not have any certain answers, since the work of changing the reporting structures were to be started after this essay is completed.

Although what I have been told in an informal way is that the study would probably not have been conducted according to any method or methodology. Instead meetings would have been set up to meet up with the buyers and discuss their situation about where we are standing at the moment in regard to this issue and gather suggestions and input about how to proceed. This would have been the initial step in the work of redesigning the reporting processes and structures.

Since software design and software development is not performed at the department, this help would have had to be found elsewhere when, and if the project was to be given resources to redesign the financial reporting in a more extensive way.

Of course this is merely guess work and no official decision have been made, but it is still interesting to keep in mind since it is a quite likely scenario according to management.

The question is really how SSM would perform as a structured approach contrary to the unstructured approach mentioned above, or at least not an approach based on a defined method or methodology. This is of course the internal approach to the problem before any outside resources were to be assigned to the project. But what approach used then is not relevant to this discussion in the same way because this study is only performed by the author during a limited time frame and if it is decided to carry on with the project external help would have been necessary, since it is such an extensive task that it would be impossible to complete with only one person.

The next question is naturally how SSM stacks up against the other described possible approaches?

The first approach of having a software development focus could be a possible and interesting way of performing a study such as this one especially from a student with a background such as mine in computer science. Then of course there is the issue about what method should be chosen out of all software development methods.

If we start out with the hard systems approach of the waterfall model, I find it hard to believe that the result of using this method would come near the quality of SSM.

First of all, at the beginning of the study we did not have a clearly defined problem, just that this area is a potential problem. We have to start out with defining the problem, if there even is a problem, and then also define a solution to the possible problem.

In the waterfall model not much help is given the practitioner in doing just this, only how to define the requirements in use cases etc.

Basically if I were to carry out the study with the waterfall method, I would be on my own in regard to defining the problem. Thus I can't see that the result would be very much different from approaching the problem in the way mentioned above with an unstructured approach. Since the waterfall model isn't iterative, I find it hard to believe that the requirements for a system such as this one can be correctly defined in the requirements phase on the first attempt, never to be altered again.

Moving on to the iterative approach I think the result would have been quite different. And the result would most certainly also vary depending on what iterative approach that would have been chosen out of all the different methods on the market. However, since they all are iterative approaches an opportunity is given to go back between the different phases to use the experiences gained throughout the process to correct errors or taking advantage of possible opportunities.

Even though an iterative approach gives the opportunity to go back into previous phases, it doesn't help you to define the issue at hand.

But having the opportunity to back and correct is no excuse for making the wrong decisions from start. Because the more errors that needs to be corrected the longer time it takes and more resources are used for unnecessary work.

The iterative approach would probably give a much better result than the waterfall method, how good will of course depend on the number of iterations and the time and resources at hand.

Since SSM and Iterative software development methods are all iterative they all have the "soft" perspective and share many ideas. However, SSM is not a software development method in its true sense and starts of in an earlier step than most iterative software development methods. While software development methods has a focus on making software development more effective, SSM's focus is instead on what needs to be accommodated before the coding process begins. While iterative software development constructs a computer system, SSM constructs a conceptual system.

From this I can conclude that SSM is the superior choice in this case. But you do not have to make a choice between these two methods, instead they compliment each other. After carrying out this study using SSM it would be most valuable to continue with an iterative software development method for the software development itself that shares the same "soft" perspective as SSM.

SSM is not meant to be a software development method and hence it will be necessary to choose a method for this, so from a software perspective it is possible to skip SSM and directly start with the software, but not vice versa.

That has also been a big point for the critics of SSM, that it does not show how to build the actual system, just the conceptual system. But it is important to bear in mind that this has never been the aim of SSM. In my opinion, a very interesting field is how SSM can be integrated into different software development methods for a hassle free transition between them.

All in all I think in this case the extra time and resources spent on doing SSM before starting with the software development will more than enough be returned by fewer errors to be corrected and most importantly knowing what really is needed.

A main difference between Business Process Reengineering (BPR) and the other methods mentioned is that BPR does not create a system, it merely reengineers business processes. But to create a working system it is almost always necessary to alter the processes that affect it, but just altering the processes doesn't necessarily create a new system even though it is possible.

Hence BPR is focused on altering business process for a business function that often is already in place to become more effective thus driving the business forward. SSM takes another approach and tries to define the problematic area and how we could create a new solution for it. When discussing this it is useful to remember that SSM can also be used for dealing with management problems and doesn't necessarily have to have the aim of developing an IT system.

So while BPR has a business heritage of improving business functions, SSM has an IT heritage which makes a somewhat different mindset in the way we approach a problematic area.

Since I, the author, never have practiced BPR it is difficult to predict how this method would turn out in this case.

SSM has in contrary to BPR a very well developed methodology and toolbox to use when performing the study. BPR has a lot of phases and steps filled with recommendations, tips and pointers, but do not have the concrete tools for each step that have to be passed and filled out as SSM does. This I think is a huge advantage of SSM, not only for the practitioner that performs the study, but also for different people within the organization that are involved in the study. This way everyone can follow the process and take part in it. Not only do I think this is important for having a structured approach, but also to get everyone in the organization motivated to improve the area that is of interest to the study. One should not underestimate motivation in work such as this and creating an open environment where everyone feels that their opinion is valued and that their input more or less directly will have an impact on how the system will be designed and therefore will improve their day to day work. Hopefully different departments and workgroups will also be able to establish relationships and get an understanding of each others work, because in the end it will always be the people in the organization who decide if the changes should really take off and be successful.

In conclusion I think this toolbox is a huge advantage of SSM, and when it is supposed to result in a IT system like in this case I think the definition of information needs for all the activities is incredibly valuable.

In conclusion my guess is that BPR would probably be quite successful in finding processes that are not optimal and also put them in a company strategy perspective, a perspective that SSM is not concerned with.

But I can hardly see that we would be able to find out so much useful information and ideas about how to design a new IT system using BPR instead of SSM, or even be anywhere close to SSM's results in this regard.

So basically my opinion of BPR's strength is focused towards improving business functions from a larger company and market context, while SSM's strength is to make useful system definitions for new systems.

Since the point of this study is to possibly design a new system, SSM would clearly have the upper hand compared to BPR. But when comparing BPR to the hard systems approach I think BPR would probably be more successful, even though it is not an IT focused method. This as I think the hard systems approach would be very hard to use in this case because it is such a vague problematic area from the beginning and with a hard systems approach I think I would easily have wandered away in the wrong directions and developed a suggestion for a too narrow system that accommodates to few roles in a suitable way. BPR on the other side has a more holistic approach and links the process engineering to business objectives and business strategy that I suspect would be likely to pick up a wider variety of issues and opportunities than the hard systems approach would be able to.

However I don't think any of these methods is a true competitor to SSM because they are such different concepts. The software development methods have a strong focus on the software development itself and are rather a complement to SSM than a competitor. BPR is

more of a management focused tool that takes on a holistic perspective for the whole business rather than only focusing on the particular processes that affects the system. So the choice is not really to choose one of these methods, it is really about if we should involve SSM before we start the software development, and on this case I think I can safely conclude that this would be the case. In regards of BPR I think it could certainly be used on this case but it would not be the optimal environment for the method due to its external focus on how the business operates.

5.11 Opinions about working with SSM from participants

Up to this point everything in the discussion has been my, the practitioners reflection on SSM and this case. To extend this view and add a deeper analysis I have decided to also include the thoughts of the other participants, the buyers.

To get a structured approach I decided to construct questions since I did not have the time to set up a meeting to discuss the matter. When constructing the questions I had two main thoughts in mind. The first one was to help the buyer to understand what I was looking for in this part of the essay so they would have time to answer the questions. Secondly to have comparable results while at the same timing giving as much freedom as possible for the buyer to express their opinions and not missing out on valuable thoughts because of making to narrow questions.

It should also be noted that the questions were sent out and answered by E-mail and that the second buyers answer has been translated from Swedish to English.

The results were as follows:

1. How do you think SSM worked as a method for dealing with the reporting process? Was it a suitable approach for our case?

Buyer 1: Seems to work very well to generate a frame work for which a database/information system can be produced.

Buyer 2: Good method. However it was somewhat abstract before one could understand the methodology.

2. How would you rate the output (our results/findings) when using SSM contrary to the efforts and resources put into it? Was it effective?

Buyer 1: Effective as described above. Difficult to rate without a tangible result, though the output in terms of describing a system was good.

Buyer 2: Hard to judge when I only attended a few meetings

Both buyers was satisfied with how SSM worked as a method for approaching this case but one of them also thought it was somewhat abstract before one could grasp the methodology. I think this is much understandable since it is probably quite different from anything they have worked with before. As with all things new things that are not very similar to work you have

conducted before it takes a little getting used to and the learning curve is steeper in the beginning. In essence I think it would be hard to simplify SSM further without losing quality in the results.

The next question about the effectiveness of SSM was regarded as good in terms of describing a system. Since we won't have a tangible result it can be hard to measure, but that can hardly be blamed on SSM. Since we are working with human activity systems that are ever changing there is not one correct answer like in an equation. That is why SSM is a methodology and not a method.

However if this study is used as a basis for creating a real software system we will in some senses be able to measure the results of that system in terms of usability, errors made, time spent on reporting, increased functionality etc. against the situation before the study.

However we live in an ever changing world and there is just no way of comparing the results in true academic sense with the exact same environment and affecting variables like in physics or mathematics etc.

This is quite natural because if we could we would probably have no use for SSM since a computer could then calculate the optimal solution.

6. Conclusion

First of all we can conclude that SSM was able to suggest a new way of working with financial reporting at VCC since the suggested conceptual system was clearly different from the current way financial reporting was made.

The natural following question is if the suggested new way was any better than the current way, or if it was just different.

To be able to answer that correctly we would need to study how well the proposed changes turned out after being implemented into the organisation. However this is a thesis that has a limited timeframe and has to be published before this type of analysis can be made. Since it is not up to me, the practitioner and author of this thesis to decide if the changes shall be implemented or not this is out of my hands and can only be a suggestion for further studies.

However SSM has clearly managed to highlight quite a few serious problems with the current way of reporting, shown in section 5.1 The next step.

With the help of SSM we have through the study not only found the problems but also come up with solutions to correct these problems.

I find it hard to believe that we would have been able to come up with these problems and solutions if we just sat down and tried to identify them without having the thorough discussions that SSM often creates. My best guess is that we would have come up with maybe a few problems and solutions, but also having a hard time to focus on reporting and easily swirled away to discuss problems and solutions that are out of scope or unrealistic that more or less relates to reporting.

Even though these are all good and viable solutions for the highlighted problems, they do not create a suggestion for a new way of conduction reporting. To do this we need to have a systematic approach and construct a systematic way of working with reporting. As SSM emphasises, a system is only as good as the parts that makes up the whole.

Since we cannot measure the impact of the proposed changes due to the simple fact that they have not been implemented yet we are forced to rely upon the conceptual system SSM produced, our comparison to other possible approaches to deal with the issue as well as the opinions about working with SSM from the buyers.

If we start to look at what SSM produced in terms of a conceptual system we can conclude that we were able produce such a system with the help of the different tools SSM provides. Furthermore reefering to the discussion section we can establish that the tools were relatively easy to use and was thought through and helpful in structuring our work and discussions. SSM was also applicable for the situation at hand and did not feel that we were “forced” into using structures and producing outputs to suit SSM’s methodology and not the situation at hand.

The outputs we produced from the various stages was thought to reflect the opinions of the group and specific enough to create a conceptual system with enough details to be well structured and usable.

In the discussion section 5.10 SSM was compared against other possible approaches where SSM was concluded to be the superior approach compared to iterative software development methods, waterfall development, BPR as well as a non structured approach.

And last in section 5.11 two buyers who attended the workshops gave their opinions about working with SSM. Both participants regarded SSM as a good way of producing a system and as a method, however one buyer regarded the method as abstract from the beginning. SSM was also thought to be an effective approach compared to the resources and efforts put into it even though the respondeé emphasizised that it is hard to measure without a tangible result.

With these three sources as a basis my final conclusion must be that SSM did suggest a new way of working with reporting, highlighted important problems as well as suggested solutions to them and did it in a resource effective way, being the superior choice compared to previously mention methods and created a conceptual system detailed enough to be implemented into the organisation.

7. Sources

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Appendix I – Transcription of Root-definition workshop

Buyer 2: Remove PAN Brand, remove that dimension

Buyer 1: Yes, I actually think we have to do that and adjust somewhat here... How did product planning end up here anyway?

Buyer 2: That's due to its inclusion in "C" in the "CATWOE"...

Buyer 1: Is it product planning that sets the price?

Buyer 3: It's the price groups, although that's not product planning...

Buyer 2: What we logically discussed at the time was the bill of materials for the cars is decisive the whoever is going to sell the product and put together what we are going to sell...so what we meant was that this might be product planning or the marketing department or something...

Buyer 1: Anyway, the ones who sets the price for the car is the ones we are referring to... showing saving progress at VCC purchasing... we are not really showing that at VCC purchasing, that should really be at VCC, its both R&D and us...

Buyer3: Shouldn't it be sufficient with showing saving process for purchasing

Buyer 1: Or show saving progress at VCC

Buyer 2: You mean that not only the commercial but also the technical savings

Buyer 1: Yes, that's the PCR as well... That's probably where we can make the biggest savings

Buyer 2: You constructed this RD with the basis in the PQR so we have to remove PAN Brand purchasing ..."O" should be VCC Board of directors...

Buyer 1: Staffed by skilled VCC purchasing employees... hmmm

Buyer 3: Is it only VCC purchasing employees?

Buyer1: Not really...

Buyer 1: ... Its also R&D and everyone...

Buyer2: Shouldn't we reflect back a bit upon the task at hand, to get grip of the whole, to grasp the primary goal of getting the right commercial result out of a system like this.

Buyer 1: The commercial can be both the match-pair targets as well as the commercial reporting. You have to be able, in this system, to separate between ratio and a commercial reduction.

Buyer 2: Yes, if you put it like this, it's actually pretty easy to tell the reduction of the price upon parts, the problem is later when we are going to do the split and tell what part is the technical and commercial reduction that the system won't calculate. If were to be able to easily measure the commercial reduction and measure the technical and put that together and get the same results as when we measure the reduction, then we are home!

Buyer 2: Actually purchasing should be able to deliver, here is the commercial results and then there is no question about it, this is correct! Now you kind of add up to the result and somehow it should be correct in the end. Now there is always doubt when we deliver the financial result, "well, we have to see what happens when we run this backwards and see how it looks then"

Buyers 3: The last part I think is good, but the part with "staffed by skilled VCC purchasing employees", it's not only purchasing, there is more

Practitioner: No, we are going to have to change that

Buyer 1: We got all of A there, actors

Buyer 3: We got both A and O

Buyer 3: It should be sufficient only to remove purchasing, and only have VCC employees and cover everyone!?

Practitioner: Question is if that is a too wide definition

Buyer 3: Yes, that could be pretty much anyone

Practitioner: ... Perhaps a more wide definition is appropriate

Buyer 2: If we look a little bit on the A part here, buyers, managers, that's purchasing, commercial buyer, and then we have cost estimators that's good as it is

Buyer 3: Finance has to be included as well?

Buyer 2: Yes, they are included. And then we got both R&D and purchasing. What feels a little bit odd is that we have buyers, R&D and TVM. TVM is really buyers and R&D.'

Buyer 3: Shall we remove TVM completely then.

Practitioner: Yes

(Long Gap)

Buyer 1: One system working across all departments in order to contribute to long-term ...the system working across departments or something like that

Practitioner: Perhaps we can just say functioning to keep it shorter?

Buyer 4: Yeah, functioning...

Buyer 2: Would we say that this system also needs to be able to distinguish between commercial and technical savings...because if we don't have that as a demand I think have quite a good system anyway.

Buyer 1: By being able to distinguish between

Buyer 3: Commercial and technical...

Buyer 1: Price changes!

Buyer 2: Savings!...

Buyer1: You should really be able to determine all price changes origin... being able to distinguish, being able to identify...

Buyer 4: Define correct savings regardless, because one of the internal factors is the commercial savings...

Buyer 1: Raw material etc etc.

Practitioner: ...Is it possible to define it possibly somewhere else? Like here if we change some bits, we could define it here also... Because this is getting a bit too long

Buyer 4: Yeah, I think you should stick with...

Buyer 1: Yeah, there we got it!

Buyer 3: It does say raw material changes, but it doesn't say commercial and technical changes.

Practitioner: No, perhaps we should add that separately...

Buyer 2: ... To be able to separate defined savings... and then can define that more on another sheet

Buyer1: You should really make all changes transparent...somehow

Buyer 3: It's commercial and technical but also the commercial between Tier 1 and Tier 2 as well, we can't see that today.

Buyer 2: What did we write in the...RD?

Practitioner: It is also possible to explain this further... in the text

Buyer 2: Yes, this will be good

Buyer 3: Show correct savings pretty much sums it all up

Buyer 1: Yeah, that's probably alright
Buyer 4: Yeah, being able to show the correct savings regardless of internal...
Buyer 1: Is it savings only? Isn't it cost moves we are talking about?
Buyer 3: Yes, actually, it can go both up and down
Buyer 1: Yeah, we have raw material going up...
Practitioner: Yeah, cost moves, but the target must be savings?... the savings could be negative to if you go in the wrong direction...
Buyer 1: Yeah, no one really cares about how much we have increased... let's stick with savings

Appendix II – Transcription of basis for conceptual model making workshop

Buyer1: ...Is this activities only?
Practitioner: Yes...
Buyer 2: Supplier negotiations maybe
Buyer 1: Those witch do the transforming, that's entering the new price right?
Practitioner: Perhaps you have to buy something as well after completing the negotiations?...
Buyer 2: You have really done that before the negotiation
Buyer 1: ...or at least most of the time
Buyer 2: It's really both
Buyer 2:... Carry out estimates, that's an ongoing activity... Those wish concern the thing witch gets transformed... the thing, it must be the price
Practitioner: Yes, what gets transformed is our figures for saving progress, show saving progress for bought materials
Buyer 2: Regarding your question to do cost estimates, if it's the first or the last one, I would say it's the first, or well, yes, okay, you can use the price that comes out of the system to see and compare it to the cost to see if there is a gap or not.
Buyer1: We input a price into the system and then it comes out something totally different most of the time, right?
Buyer 2: Any activities concerned with dealing with the transformed entity, that must be what the finance department are doing, they are trying to get... if we, first activity is negotiate with the supplier, and the second step is that we enter it into the system, and as a third step the financing people try to get that verified by reading in the system, could that be something? To start with
Practitioner: Yes
Buyer 1: Isn't it enter new price in system and the next one is...finance reads it...R&D reads it in their PCR
Buyer 2: But that should be on the third one, shouldn't it?
Buyer 1: Which do the transforming...we start something when we input the price
Buyer 2: And then dealing with the transformed entity that is what the finance people do.
Buyer 4: Yeah, because they generate the results.
Buyer 1: Yeah, in another way, part numbers
Buyer 4: We are not generating just to report down here are we? We are just trying to enable finance to show the correct savings... correct commercial savings
Buyer 1: So basically when we define dealing with the transformed entity, dealing with the transformed entity, is that the result?
Buyer 4: That's what the system you are discussion would generate

Buyer 1: So the transformed entity is entering the new price

Practitioner: Yeah, the transforming is when we put in the numbers in the system and the system processes the output to being able to report it in the way that is required.

Buyer 1: Really what the point is with “dealing” is the finance report... and the PCR report...what everything is about is entering new price, it shouldn't say anything more there, right?

Buyer 2: It could be other process steps you need to do to get the new prices into the system, quote one pages...

Practitioner: Perhaps it needs to have some kind of interaction with the other systems like if we need to keep track of something to gather data automatically and get some kind of base data, I don't know really

Buyer 3: That depends if you refer to the article price or the turn-over, if you are referring to a total turn-over then it's the volumes you can gather

Buyer 1: So here could be to enter new price at new volume entered

Buyer 3: All new conditions

Buyer 1: Wish makes the output different

Buyer 4: You get a price list, yeah? And then from the price list that goes into... supplier negotiations create a price

Buyer 4: I mean it's correct with... supplier negotiations create a price... wish is of course minus savings and then no, those activities wish do the transforming (draws on paper)... I mean as a buyer you are not actually doing that, you are not actually transforming anything, you just put it into the system, we need a system to transform in order to enable the activities concerning dealing with the transformed entity

Buyer 2: Are we to describe these activities (points)

Practitioner: The point of the model is try to model the PQR transformation and the CATWOE and everything in the activity model that we are going to model has to have its base in the things that we defined in the CATWOE, the three E's, the root definition and the PQR and trying to model how we want the system to be like... not to have to much focus on how it looks today even thou it has to be a realistic system and try to keep it realistic

Buyer 4: Supplier negotiations is right, the things that's do the transforming

Buyer 2: If we think about it in this way, if we have one part number then its quite easy, you negotiate with the supplier and you put in the saving in the system and then you get the finance report out. That's very easy.

Buyer 4: Yeah!

Buyer 2: But if we extend this slightly and see, the normal thing that happens is that we have some sort of part number change and ... then you have to track this one way or the other to get the right information out of the system like this, and maybe that is an activity...nowadays I would say, we try to do this afterwards, to do the tracking, the finance guys don't get it right and then we try to track it backwards to... if we would do that in a correct way here (points) I think here, then it would be a lot to gain.

Buyer 3: Yeah

Buyer 4: It's not just the price is it?

Buyer 2: It's also the part number change and especially in our commodity we also have that one part number becomes five or five part numbers becomes three or something like that

Practitioner: Okay, so we have to, activities...

Buyer 4: Do we have to clear that up then or? Three activities, is it really supplier negotiation then? Where do we start?

Practitioner: Yeah, we can start wherever we like basically

Buyer 3: It could be technical changes?

Buyer 4: Technical changes, yeah, whether it will be a new part or yeah, technical changes is probably best

Practitioner: Yeah, we can put it there I guess

Buyer 4: I would put technical changes before supplier negotiations

Buyer 2: Commercial changes, technical changes and raw material changes, that is

Buyer 3: and D&D!

Practitioner: This is just a way, just a list for making the model later, so it's not important in what order we really... just so you know

Buyer 3: Ah, okay, yeah!

Practitioner: Technical change...

Buyer 3: Raw material price changes, raw material changes... capitalized D&D...

Buyer 2: If you cancel the program you will have to pay in the rest of the variance I would say

Practitioner: Currencies perhaps?

Buyer 3, 4: Yeah

Buyer 2: But should we change supplier negotiation to commercial change? Commercial changes

Practitioner: What, where?

Buyer 2: First, commercial changes, because if you do the supplier negotiation you take it, all of it, you do the negotiation on all areas I would say

Buyer 2: If we look a little bit more on this it's really not activities we have written here but occurrences, but maybe that?

Practitioner: Occurrences and activities is very contiguous at least.

Buyer 2: But there is nothing there that...what we do to achieve this is, well

Buyer 3: Commercial includes volume changes, or? Volumes doesn't affect the detail price but it affects our turn-over when we get higher?

Buyer 2: Perhaps we should add manufacturing volumes?

Buyer 3: Yes...

Buyer 2: The activities wish do the transforming, that's a tricky one I think, what do we do, we input the price into the system and then that's it. Isn't that our problem, we should do more when we do that in order to...

Buyer 3: Input more details like D&D or raw material and specify so you get better awareness of the detail structure so you can describe the changes, if you only input an answer you can never get that information.

Buyer 2: And there are many price changes that directly... most of the time when this happens, technical changes, at the same we change the article number, then our purchasing systems loose track of the traceability. We would strike gold if we could..."ÄO" is already there

Buyer 3: They got that at RS, when they update the "ÄO" see what article number gets replaced

Buyer 2: In 95% of the cases it is solved with the help of the "ÄO" and then we have our special problems with our cables/harnesses when 14 article numbers is replaced by 16, but that's something EDS have to live with.

Buyer 3: But you can never find that there

Buyer 2: Cant we just write enters new prices and the reason, so carry that line of thought with us. Enter new price and root cause! Can you also add to help our memory that it would be good if we could track part number change?

Practitioner: Historical tracking perhaps

Buyer 2: How does our systems really handle that? The "ÄO's" is there, that's really what they do at the finance department, they have Qlickview and look at an article number and

then they switch over to KDP and view what the article number became and connect it, but it doesn't happen automatically. Change order...

Appendix III – Transcription of information needs part one

Practitioner: Perhaps we should as much as we can to look at this from the perspective of the system.

Buyer 3: The thing is, if you are going to take a high level overview such as this one you basically got to say, the approval in SI+ is the approval... information from SI+ as you are planning to do, or I assume that's the intention with this. The basic information from SI+, I don't know, yeah, but, instead of having, what is it 8 reason codes, you have 4 or 5 stuck in there for raw material cost, or bought material cost is already in there or length currencies, best definition is technical changes maybe. The approval in SI+ is got to be the approval...so behind each of those, technical changes, raw material, D&D, currencies fluctuations, manufacturing volumes, each one of those where it might generate a price change is got to be approved in its own particular forum but then the final approval is done in SI+ and you would hope that the managers when they approve it carries the cost path and been to such and such so you don't mess with finance, that they ask those questions.

Practitioner: Yes, anyway... you can always say that you have to get some kind of management approval, or?

Buyer 2, 3: Yes

Practitioner: Even thou it's a very complicated process to get there. Then the basic thing is that management has to approve the changes somehow. Maybe we can write that to keep it as simple as possible here. So maybe "Buyer inputs new affecting figures into the system after management approval", what do you think about that, can we say that?

Buyer 2: We put in the changes first and then the approval. It won't be affective until it's approved.

Practitioner: Yeah, okay

Buyer 2: This function is the most important thing, this is the reason why we change from the old SI system to this new one. Because the approval process in the old system was not there actually.

Buyer 3: It was down to SOX wasn't it, the old SI system wasn't SOX accountable. It was no accountability in the system. You could just update a price and that was that. Whereas now people got to approve it...!

Buyer 2: If you put in a price change which takes for instance one price up. Lets say 5€ up, when its affecting on 500 parts if you get an approval sum, then nothing is stopping the factory from buying not 500 pieces but 500 000 pieces instead just to call for the material, so the approval system is lousy really. It's not connected to what we buy, it's actually just connected to get volumes.

Practitioner: What you mentioned before, I am just curious about this with the approval before and after, if there is some kind of meeting like that with the raw material or what is was, and they say that now we have to do a change from Y to Z or something and you start

doing that changes, do that have to approved by management in the system like SI+ or something even then?

Buyer 2: Yes, I would say

Practitioner: So basically in the way of the system it always has to be approved after it's typed in.

Buyer 3: ... it doesn't matter weather it's going up or down, it still needs approval.

Practitioner: Yeah, so basically then I think we can write "Buyer inputs new affecting figures into the system before management approval" Even if you get management approval before you type in the figures then it has to be approved again

Buyer 2: Yes

Practitioner: So we are moving on to measure of performance for this activity... My suggestion is... "Influencing figures is applied in a way that makes a historical traceability possible", that's basically what I made from what you talked about with the root cause... but I am not really sure that its appropriate to have here now that I think about it.

Buyer 2: Are we trying to express what we want the new system to do?

Practitioner: Yes

...

Buyer 2: Then sometimes technical changes are connected with part number change and then we loose the track, then it's not that obvious anymore.

Buyer 3: Yeah, maybe you will benefit, within Ford they got a system (shows on paper).

Within VCC if we got a nut, just an ordinary nut. Then we give it a part number.

Buyer 2: 8 digits

Buyer 3: For example two years ago we had to take away cromium6 from all parts. So they just create a new part number. And that's it, we loose traceability. So it's only by going back into the engineering system and checking the change order or for the buyer actually having the PCR's there.

Practitioner: So its detective work for the buyer then

Buyer 3: Yeah, wish isn't the best actually when you got people changing all the time.

Because I don't know people file things in different ways, things aren't recorded in a proper manner and so on and so forth, it gets lost! So to try and help that they have actually put a suffix on the end now, A, AB and so forth, but the trouble is, say they were to change the thread on that nut... And you couldn't use it on old vehicles. They would create a new number again, so you still loose the track ability. So this helps up to a point because you can go, okay I can se where it changes to AA to AB to AC or raw material cost that affect that or technical changes and you can track it. But then as soon as you can't use it on old vehicles changes and a new number comes in and you loose it, so that's VCC. In FMC as a whole including jaguar/land rover, say that they develop a nut for the EUCD platform and you phase a new program you got, what is it, a prefix that defines a new program, the "6" is the launch year, I can't remember what that was but this is just an example. That would be your launch year, that would be your program and that's witch brand is responsible for it. So say you got the B platform, it might be split between Mazda and Ford on the EUCD platform. It's been split between Jaguar/Landrover, Volvo and Ford, so that defines who is responsible for it. So then you got a base, I can't remember how many digits are in the base but...

Buyer 2: Five I think

Buyer 3: Five yeah. And that describes the system so in this case our nut would have a similar arrangement, it wouldn't be exactly the same but you could basically see looking at the part number, okay that's a nut, or that's an air conditioning unit or that's a bonnet or something like that. And then you got the suffix on the end, that's AA. So as long as this nut is used in that program, it's a nut. So the only thing that changes is the suffix. So you can track it for its whole life...

Buyer 2: Its quite good as well because you can see, because you can pull out of the system that on this car you use 53N1A81 and then it doesn't really matter what the suffix or prefix are really...

Buyer 3: I mean that's a scenario that happens at Volvo as well. For example some of the EUCD parts are old P2 parts. So in the Volvo system you got that number. But then for EUCD you got a new part that's different for EUCD and you got that number. So if you are going to figure out how many parts per vehicle you are trying to use you can end up having to track two numbers. Or whereas in Ford you can actually see, well okay, an engineer can say AA and AB is practically the same we just changed it slightly to modify it so we can get it in a whole for EUCD.

Practitioner: So the bottom line is that these are just random unique numbers

Buyer 3: It's put from the air somewhere

Practitioner: It's not thought through basically

Buyer 3: Yeah, I guess it was historical, at some point where we was shipping part numbers when building a new vehicle, okay give them random unique numbers. So just give them a unique identifier. So the problem that we got with all of these is, I mean you can have your reason codes in SI+ 1 to 8 or whatever they might be, if each buyer got their own or what could be chosen to do that, and you put that in, you can track it on that number but as soon as you change the number you loose it and so, if we saved, I don't know extreme, if we saved 30% on that one. It shows up on the next report, and the next one is 0 %. Or it might be that the raw material cost is added 5 % but it goes back to 0 % on this one. So in terms of commercial reductions and posses it's lost completely.

Practitioner: So basically what we need is a relationship between the part numbers.

Buyer 2: And these relation is, you can find it in the change orders.

Buyer 3: The idea would be that, shoot me down if I am wrong, but in SI+ you can put your reason code in, and the system actually goes, hang on, the buyer has just put in that the reason for this going up in price or going down in price is a technical change. The reason why this part number was created was change order number XXXX, there is actually a line in the change order that says the reason why the part number has been created or part number changed. And if that could go in somewhere into a finance report then our colleagues down in finance could go, okay they made a reduction, and in this case it's a technical reduction and it was due to taking away chromium6 or...

Buyer 2: That will normally happen, because what happens for the buyer is that, ops, a new part number, ops, it comes a new part number, what is this you wonder and try to get a price of it hence there is nowhere in the system, in SI+, when it comes a new part number its just like that, there is no connection to the historical, to the history in any way.

Practitioner: So the whole root cause here is basically that there is no relationship between the numbers... Yeah, you can't trace back

Buyer 3: If you consider all that you got...

Practitioner: So basically everything here would be solved, if you could click expand or something on a new number and see the old

Buyer 2: Its also important to know in what way you want to use the information to be able to do the tracking in a correct way because its also very useful, I mean it happens all the time, its very common for instance this nut as Richard declared or described above there, it suddenly becomes not one new part number with the same volume but it becomes two or three part numbers with a third of the volume each.

Buyer 3: Yeah, that's a big problem as well. We saw that in EUCD and we suddenly got half a million units we producing aren't we? We are using one part number but then when you actually look at it its three part numbers but it's the same part, just that one has been

developed for Ford, one for Jaguar, and two has been developed for Volvo, but it's the same nut.

Practitioner: But basically everything comes down to that there is no working relationship between the part numbers.

Buyer 2: Not that it's easy accessible by SI+. There is of course tracking in the change order.

Buyer 3: That's what we trying to describe here, as a buyer, you sat there in SI+, a new number comes in to your queue, you see the new part number, you get a pull effect from the purchase coordinators who are saying "guys we need to get this part into the plant". Oh, we got a new part number. You send a mail off to the supplier "what the price?" and they send you the price back and you go, hang-on, that's the old part this is the new part, yeah that seems to be about right. As a matter of fact if you stand back and go, hang on, I need to understand where this new part number suddenly comes from. I mean at some point the buyer should have signed a change order, I mean in terms of where the number comes from, it appears the number comes from KDP, its actually on the change order, I mean the reason is in there. So in the case of part number changes the reason is in the change order but that doesn't get carried from there to there. I mean it's stored in KDP but it doesn't get carried there. I mean the trouble is that it's only a document so I don't think you could actually automate all the information from there to there. That doesn't really solve why you got currency changes, it's only that first one the technical changes.

Practitioner: A spontaneous reaction here is that technical changes and commercial changes could be different entities here?

Buyer 3: My thought now describing it to you for the technical changes is that there should be, I hate to say it because it puts more, shoot me down again if I am going in the completely wrong direction. As a buyer I would hope I would know that's the old part number and that's the new part number and I would know the reason for the change. What I feel we need is basically some kind of tick in a box somewhere in SI+ to say actually this part number was that part number.

Practitioner: Yeah, that's basically establishing a relationship between the numbers.

Buyer 3: It starts a completely new question mark, yes or no. If no, then what the reason for the change and just a brief one liner and that should be on the change order.

Practitioner: But everything comes down to that there is no working relationship between the numbers. Then ticking a box or whatever is basically kind of a solution to the problem that there is no (working relationship)

Buyer 3: Yeah, that would help. It doesn't fix everything for example on the EUCD changes where the part were carried back to old vehicles. A part number change on EUCD costs in figures from 50 000 SEK to 200 000 SEK and then we can just say we can't afford the part number change or we wont do it.

Practitioner: "...by establishing working relationships between part numbers"

...

Practitioner: What information do we need here to commence with out technical changes within the system

Buyer 3: ...What? From the purchasing side? It's the PCR quote one pages.

Practitioner: Okay, so it's PCR...

Buyer 2: Don't mix it up with the PCR report, because this means product change request.

Buyer 3: It might be best to change technical change/PCR to concern, product concern, VCC concern!

Buyer 2: Yes

Practitioner: ... thru or by PCR, that basically what you get it from, right? Some kind of PCR or how does it work?

Buyer 3: If we start from the beginning, Volvo needed some kind of change process for product change request for changing the parts and they came up with PCR process, product change request, simple. And its one document with timing, costs and approval, all in one document. And then within ford, the way they work is that whenever a part is changed they release a concern. If you are concerned with a part you need to change it, so concern. The concern is basically two documents, you create a concern to change the part so one engineer goes, oh, we definitely need to change this part, or even creating a part. You create a concern and you get a unique number. To get that approved you got two documents... one called a support plan and the other one is called a quote one page. So you got two documents, the support plan is all about timing and instructions. So...basically, timing and quality... So you got a quote one page wish got costs and volumes on and those two documents has to be approved in different forums. So whereas one document at ford that was basically just approved by a small group of people, within the concern process you got two documents wish is sent all over the shop, don't they? We will be in that process for the next three months. Like I said it's quite well described within BMS. You got two documents, the one that buyer is concerned with, it's a discussion that can take all day, a quote one page because that's got your costs on. That's basically the information you use to change it in SI+.

Buyer 2: In many commodities they use PCR's to get the information correctly and then they take a set of PCR's, 10 or 15 PCR's and then they create a quote one pager.

Buyer 3: The problem that we got is basically that within ford there isn't a clearly defined process how the engineer goes to the supplier and says can you have a look at this, don't do anything yet but just have a look at it. Whereas here at Volvo we kind of go, hang-on, we haven't got a process to do this, now you are giving us a concern process but we carry on using the PCR process and ... create 15 PCR's and... call it one concern.

Practitioner: So its kind of a Volvo way adapted to the ford

Buyer 2: We do it the Volvo way and the ford way!

Buyer 3:... at Jaguar/Landrover they use DCE's and they have exactly the same problem, how do we approach the supplier before we go ahead and release a concern, just to release a concern creates flags in all kinds of systems all over the shop ...

Buyer 2: Sometimes the supplier is more involved and they are running the shop completely and they decide themselves that now we need a concern.

Buyer 3: Yeah

Practitioner: Do we need information support provided to us by, for raw material prices

Buyer 3: I don't know where that comes from, where do you get that information from?

Buyer 2: It's a combination of information coming from engineering telling how much the content of certain raw material varies within the component and then the price, the result of it so to say, raw material market price x weight, that's the price change that comes from the supplier. And then we need to get the raw material market price confirmed somehow internally here. When we get the copper adjustments from Lear and Delphi we always go into the London Metal Exchange on internet to make sure...

Practitioner: ... So basically it's up to the buyer to summarise all that somehow?

Buyer 2: Yeah I would say that, and then there is a forum to present the case

Practitioner: What we spoke of now was raw material prices

Buyer 2: I think it's called directors board of raw materials or something like that

Practitioner: But that was for raw material prices only, right...?

Buyer 3: Yeah, so the base for raw material was engineering and supplier really giving information. So I guess it's initiated by the supplier basically saying we got an increase in cost, we need to account that.

Practitioner: Does that go directly through the buyer or through engineering and end up here?

...

Buyer 2: Either you do the payment in a lump sum payment and then you have to take each and every case to this directors board of raw material or whatever it is called or you get a process, for EDS we have a process where we take the average price for each months period and add it on to the piece price and then we have to change all the prices twice a year. Then we don't have to get to that board but then we have to, in the EUCD process for instance we have it approved by engineering by MOP wish is a part of the... it's a Ford process as well, I haven't really found out about the origin of it but its fairly established and it's the way we do, to get the suppliers to fill in the MOP.

Practitioner: Okay, so basically this is the supplier and the construction

Buyer 3: The information is supported by R&D and the supplier isn't it?

Buyer 2: Yes, R&D and supplier

Practitioner: R&D and supplier...

Buyer 3: The initiator is the supplier but the information comes from R&D not the supplier.

Buyer 2: But the R&D department should reach of the copy content of a certain part number

Buyer 3:

Practitioner: Should we carry on to the D&D changes then

...

Buyer 3: I suspect an awful lot of suppliers where we are doing that are getting more money than they should be. D&D changes I would change to capitalization.

Practitioner: Capitalization changes... So where does that information come from?

Buyer 3: That comes from agreements between R&D and supplier and purchasing.

Buyer 2: When there is a job split and a statement of work and I think the statement of work requires some sort of engineering budget from the stuff supplier, that these are the resources somehow connected to the sum here. We want to see the real connection, because normally we say that we don't buy 10 people from you, we want you to do this work and if it takes 10 people or 100 people we don't care about... but information regarding these arrangements should be available in the target agreements for each and every part.

Buyer 3: Yeah we put TA...

Buyer 2: Not TA, Its CPA nowadays

Buyer 3: What was it commercial...

Buyer 2: ... program agreement

Practitioner: Okay, moving on to currency fluctuations

Buyer 2: ...You have to talk to finance about that

Practitioner: Manufacturing volumes

Buyer 3: In the beginning of the program we get it from R&D who gets it from marketing

Buyer 2: But that's not really valid when it comes to reporting the result, we are basing our forecast on volume number that comes from this PVD or whatever it is called, this file we get out every month. It's the planned production volumes in the factories for 24 month forecast. That is what we plan... How we are doing our forecast. But when you are reporting out of course you take the true volumes that has been produced.

Practitioner: And those true volumes I guess must be from...

Buyer 3: You can see it in SI+ but where they come from I am not sure, it must be some kind of link to the manufacturing system in SI+ but that's when you need to get the process map for the system to show that.

Practitioner: But somehow it has to come from manufacturing

Buyer 3: PDD file is the commodity business plan, is that the one we use or? That should include date, shouldn't it?

Buyer 2: For the commodity business plan I have been using the long range plan...where you can see future volumes up to 2015

Practitioner: I think here we really have the right stuff to write out a little bit about the concerns about all these relationships. This is where we specify information gaps and opportunities and that sounds like quite a big opportunity.

Buyer 2: To point out the really weak point finance has to provide... algorithm for how they are calculating the commercial result... Finance defines an algorithm... that describes... an algorithm is a mathematical way of describing, not defines, more like states an algorithm for the financial report.

Practitioner: Should we include something more here under GAP's and opportunities?

Buyer 3: Historical tracking of part numbers, I would also put changes in there. It can be useful to know, especially for the reports. Tracking correctly the process to see witch date it was changed and from that figure out witch PCR it was and what the PCR's would cost and so on and so forth.

Buyer 2: It should be, when it comes to capitalization, we should be able to directly see in SI+ the capitalization part or the buy. We should have it separated somehow...

Buyer 2: And then it comes to manufacturing volumes

Buyer 3: That's not to easy is it because it depends on the supplier and the situation, because some suppliers go, okay they got a volume increase, let them have it...but other ones go, wait, we need to get something back for that.

Buyer 2: Another thing is to have the volumes when we create our forecast and that is a purchasers problem I would say. But somehow when they create the report then they have the true volumes to back into.

Buyer 2: They should specify that as well, what they (finance) need in their algorithm and if that is an issue for us we can say so to them.

Practitioner: Should we move on to enter new price details...

Practitioner: I just guessed that you gather data from agreements and other systems such as SI+ or something to enter new price details...

Buyer 3: All the systems, I don't know... new prices you get from the agreements, the PCR, the concern or the MOP or the...

Buyer 2: ...Consider internal and external environmental constraints, buyer inputs new affecting figures before management approval...then gather data from agreements and other systems

Buyer 3: It comes from agreements, isn't it? Gather data from agreements

Practitioner: Then we can toss this part

Buyer 3: I think your worry is that you started off by putting the...

Buyer 2: price

Buyer 2: We are almost ready with enter new price details

Buyer 3: Yeah, it looks good

Buyer 2: It looks good

Practitioner: Everything is right in the whole row there?

Buyer 3: Yeah

Buyer 2: From the next line there, interact and accommodate other reports. I am a bit against this, if you are using a database here with a lot of data and pulling out the reports of that. And if you need something to make another report, maybe you need from that database and you need the data but you shouldn't use that report, you should use the database to get that data

Practitioner: Yeah, yeah, and get to the source...

Buyer 2: Yeah, it exchanges data with other database I would prefer to say, even thou the data from those databases are presented in other reports

Practitioner: Yes

Buyer 2: ... Is there a part of analyze in this data?’
 Practitioner: Yeah, I guess it will have to...correctly analyze...
 Buyer 3: Exchange gathered data
 Practitioner: I am not sure that’s a measure of performance
 Buyer 3: Exchange gathered data from ...Exchange and analyze gathered data from reports...data sources...
 Practitioner: What did you say?
 Buyer 3: Exchange and analyze gathered data from reports and data sources.
 Practitioner: Maybe it’s also important that we don’t have redundant data?... Avoid redundancy
 Buyer 2: ... When I do manual reports in excel and things like that I always, to avoid mistakes I try to work in a way that I double check my result by calculating it in two different ways... there should be built in some kind of checkpoints in the system.
 Practitioner: ...If those checkpoints are made correctly by the systems engineers team then the data will be exchanged correctly and reported and avoid redundancy...

Appendix IV – Transcription of information needs part 2

Buyer: PCR and finance need this; they are the one who are making the reports from this data. And then, information support, support provided by...
 Practitioner: Is that TVM?
 Buyer: TVM, I don’t know, what happens on this row is the ones who are going to make their reports have to use our data, use a little bit of other data from other systems and maybe analyze this a little bit and put it together in the form of a report and the data who comes from enter new price details is what states what we do here at the purchasing department. You could say that that is a form of support for finance and PCR when they are making their report. Yes, purchasing has delivered their numbers now, and then they need to look into other systems to look at manufacturing and a few others and then see that we got the green light from them as well when they have delivered... and now we can make our report.
 Practitioner: I was thinking, maybe we need to exchange some data with finance?
 Practitioner: Or is it only the output they gather?
 Buyer: Yes, but what is... their report doesn’t match our output
 Practitioner: Let’s carry on to PCR then
 Buyer: I would say the finance report feeds the PCR report... what is a commercial change gets verified by the finance report
 Buyer: What we input in the system often correlates quite well to the PCR report but the problem comes when that is going to be verified through the finance report, then it doesn’t match, the gaps are too big. But maybe it can sometimes be the other way around, the finance report is the right one, and that’s a big uncertainty...
 Practitioner: Discrepancy between purchasing...
 Buyer: I was thinking about the one with the problem “data is exchanged correctly and reported” and redundancy is avoided, shouldn’t it be like that instead? What is really valid here is that finance states an algorithm for the financial report...
 Practitioner: Shall we move it down or have that on both places?
 Buyer: ...both
 Buyer: The ford people always do it like that, when they are going to lower they always say for example 3.5 % but also when, that’s also important for us, but mostly for having everything in order with the supplier when we lower the price, but ford are saying, okay, 3.5 % starting from the 1/6, if they have a turnover of 100 %, 100 millions, 3.5 % of that is 3.5 millions and that becomes...

Practitioner: That must be 1.75 %

Buyer: Yes so that becomes 1.75 MSEK and that's really much better, but it can also be that they have no reduction at all from their supplier so the price... lets say this reduction was taken into effect 1/6 and they take into account that reduction, Volvo is just looking at the reduction when it comes to purchasing. But ford can also make the decision that they are not going to make a reduction, the supplier instead deposits 1.75 MSEK to fords bank account and then they have reached their goal even thou they have the same price in the system and that's not really good either. A combination here would be the optimal, to track both ways. Sometimes it can be good to lower the price 5 % in December because you get a low price for the whole next year but the year when you do the reduction, well then you have paid to much for the other months...

Practitioner: ...Having the same price and making a deposit into the bank account... what is the point of that?

Buyer: Maybe the supplier doesn't want to lower the price but can make a discount or refund of a certain amount and then it becomes more of a yearly negotiation.

....

Buyer: Produce Reports are we on now, right? It was good that we included that finance states an algorithm.

Practitioner: Shall we move that down to produce reports perhaps?

Buyer: ...No

Practitioner: Yeah, it belongs to both perhaps; we will keep it as it is for now

Practitioner: But buyers have to be included as well, right?

Buyer: Yes

Practitioner: But now I can't remember why I wrote strategy & process leadership here...

Buyer: What could be is that we got this with... If I express myself with lack of precision here you could say manufacturing here, because somehow we have to include volumes here but on many details and especially the take rate. And if you look at fords way of calculating, that upon one commodity we have now for one year bought for 50 MSEK and then we reduced the price by 10% but the take-rate increased and instead we have this mounted on not 10%, but 25% of the vehicles. In other words some skilled salesman has made this happen. Wow, we lowered the price by 10% but yet it went up from 50 MSEK to perhaps 100 MSEK, is that good or bad?

Practitioner: Well that has to depend on the take-rate then?

Buyer: Well, if we write manufacturing there I guess that would make the necessary connection

Practitioner: I think this has quite a lot to do with this "presenting in an appropriate way"... do we write finance there then?

Buyer: Well, they are really the ones doing the work now but... they have to support themselves a little bit here now, maybe they need some data from some kind of people working with raw material to make the right assumptions when making their reports.

Practitioner: Maybe what we got now is sufficient?

Buyer: Well, they need a little bit from R&D as well, they need to know...

Practitioner: Should we include them here then?

Buyer: If they have introduced a technical change and the prices skyrocket it is important for us to know this... we said we were going to call it VCC concern now, but lets keep R&D here, or wait, we you can write R&D VCC concern. Did we write manufacturing up there before? I think we wrote manufacturing volumes. You can write volumes, take-rate etc. after manufacturing... maybe we should have ratio as well.

Practitioner: What is ratio really about?

Buyer: It's a bit funny when you say it in English because Englishmen don't understand a word then, cost savings is what it is called in English. It's really some sort of measure to make a more rational construction.

Practitioner: So it's really product development who come up with smart solutions?

Buyer: Yes

Practitioner: Should we include information gaps and opportunities, an opportunity here is really to better manage... it really goes through everything here with finance to get better cooperation, that everyone is not doing their own calculations... that we can get good reports that everyone is satisfied with using the same base data, that has to be an opportunity.

Buyer: ... Somehow I think what is demanded many times is some sort of monitoring upon this. Feature increases, well you would like to think that the price was constant if no activities was made... well, you would think that the material bill would be the same if you did not negotiate the price or make any cost "ratios" or quality changes. But the reality is that the cars get more and more expensive because if you want to compete on the market you have to include new features, and that is done, at every "ÄO" something new is included. The car becomes more and more expensive, and somehow it would be great to have some sort of monitoring of feature growth upon that to relate to.

Practitioner: To sort out some sort of underlying trend

Buyer: Yes, and I think that engineering R&D, when they make their PCR report my assumption is that they have some sort of method to do this. But how that is conducted is unknown... I think the responsible for the finance report and PCR report would have a lot to benefit from more cooperation.

Practitioner: Maybe creating some sort of platform to support more cooperation

Buyer: Yes

Practitioner: Needs... and possible improvement...finance... product development, who should really be included here? Finance? The PCR people? Are they called TVM?

Buyer: No really, I think you can write PCR responsible's, product cost report... its

...

Practitioner: Are we satisfied with the produce reports activity now?

Buyer: I think that's about it

Practitioner: All right, on to the next one, only two more to go, exchanges data with other system. It's really mostly SI+ that is used to type in data, right?

Buyer: Yes

Practitioner: Or perhaps any more, measure of performance, exchanges data in a timely manner, that's good right? That's its easy to get the data without having to do a whole lot of workarounds to get the right data so a bridge is made (between the systems)

Buyer: PCR and finance is the ones who need this, I don't know, you have written TVM and finance here on various places, when you say TVM, what are you referring to then?

Practitioner: I don't really know actually

Buyer: TVM stands for team value management

Practitioner: That's really, or as it was explained to me it contains three groups

Buyer: It is an attempt to work cross functional and a adapting the ford way of working that Volvo really already was, but never mind, its product development, purchasing and purchasing is supported by cost estimators. Really you shouldn't have to say that because cost estimators is a part of purchasing, but at ford cost estimators belongs to central finance so that's way its three parts from a ford perspective and they are involved in this operation... TVM's focus lies perhaps not in what things cost at the moment but activities that affects the price in the future. But I don't thing they really are a reporting body in the way that they deliver any reports that comes into direct use.

Practitioner: Is there any more systems?

Buyer: Let me think, there is Pecca or Mecca, I am not really sure about the distinction. But my understanding is that you can see what is produced in the factory to what costs and information such as that. Its manufacturing's system I think.

Practitioner: Perhaps there lies some information that affects this work

Buyer: Maybe you should write manufacturing, Pecca and Mecca. But we are really talking about the same thing in different places here in this column, here in the top we say "manufacturing volumes" then "volumes take rate etc." then "Pecca, Mecca" and what I am really saying is the same thing all the way through the column here, there is quite a bit of useful information to be gathered here.

Practitioner: Maybe we should remove them but be aware of it.

Buyer: Make we should make a note of it in the corner that there is systems called Pecca and Mecca.

Practitioner: I will write this here at the moment so we can place it in a more appropriate place later on.

Buyer: Review reports, and that's management who reviews the reports. Somehow its management who decides what the report should contain even thou they sometimes need a little help with that.

Practitioner: But in the end it's their decision that counts

Buyer: Yes, they are the customer here, right?

Practitioner: Even if they need help to know what they need to know its still them who takes the final decision, so its more of recommendation (that is presented to them), you should know this etc.

Buyer: Yes

Practitioner: Long term profitability is achieved, management receives the right figures presented in an appropriate way. That has to be the point of all this reporting, right?

Buyer: Yes, that sounds good, if I was the boss I would like to read the report and it shows good numbers I would like to be confident that we have a good price level in this company.

Practitioner: Reliability somewhere perhaps, that we can thrust what is presented to us.

Perhaps we should write that somehow, reliable...

Buyer: There is the words, reliability and viability, we often talk about that regarding cars, do you have a dictionary at hand?

Practitioner: No, I don't have internet access here

Buyer: ... I think viability has more to do how it lasts over time

Practitioner: Yeah, I think I know what you mean

Buyer: But that's not really the case here so it has to be reliability...

Practitioner: Management receives reliable correct figures presented in an appropriate way...

Buyer:... The report has to be up too date, maybe that should be included somehow, no, skip that, it's to complicated

Practitioner: We kind of have that covered in reliable correct figures

Buyer: I mean, like when the big stock market companies present their annual report it's about one month after the period it represents and well then it's a little too late.

Practitioner: Yes, well then it's in the past

Buyer: Yes, I mean its naturally that's in the past, or else it wont be a report but somehow when it the end of the period it would be great to automatically generate the report the day after the period instead of taking eight weeks to get it together.

Practitioner: Yes, within a reasonable timeframe. How should we put that down, correct figures presented in an appropriate way and in a timely manner!?

Buyer: In time I would say

Practitioner: Yes, that's even better, that has to be everything on that one. Information needed? Everything pretty much leads to this last point...

Buyer: Yes, that's everything, when the highest boss is doing his reviews he goes like "oh, look at that one there, what has happen there, then he need to ask a lot of people to get that knowledge"

Practitioner: So in some way this is the data that we have gathered in all the other steps

Buyer: Yes!

Practitioner: Gathered data that we have retrieved from different sources and processed.

Buyer: Not like how it is now, when the report is on review and management says it's not correct.

Practitioner: What was the last one, information support provided by. That depends a little bit on how you look at it, in one way its al the other points here to gather our base data and get support necessary. So really it's all of them but...

Buyer: Really, if you use database in the bottom (information layer) that is user friendly, then it's easy for whoever needs it to login and verify where it comes from, what is it that you are looking it in whatever system it might be. It shouldn't be necessary to have three guys around you to tell you what has happened. It should be within the systems.

Practitioner: A measure of performance here is really information support provided by no-one. No one should really be needed, you should just be able to retrieve it without the help of anybody. So it's really No one, none, that should be the optimal.

Buyer: Yes, it has to be that

Practitioner: ...Information gaps and opportunities, the last box.

...

Practitioner: An opportunity here has to be automate processes, to collect all the data at one reliable source

Buyer: And in extension this frees up resources for other tasks, that could be a bit sensitive if it frees up resources to fire people, but they could do something that makes more sense than this (current reporting).

Practitioner: Free up resources, no that doesn't sound right...

Buyer: Utilize is something that can be used from time to time.

Practitioner: Utilize what?

Buyer: That means taking advantage of, right?

Practitioner: Yes, the thing is we no longer have to...

Buyer: Enable

Practitioner: Effectives the use of resources, perhaps, or? Frees up resources...

Buyer: Yes...

Practitioner: Let's write free up for now

Buyer: Enables, can spend more time on commercial issues. Enables personnel or

Practitioner: Spend more time

Buyer: On commercial issues! Or commercial work perhaps, issues is more...

Practitioner: Work while...perhaps something more, reliable, reliability of data

Buyer: Personnel is perhaps not the best word, people is perhaps better

Practitioner: Employees

Buyer: Employees!

Practitioner: An opportunity here is perhaps to give management the right tools with these reports to be able to act in the basis of what is identified in the reports... Provide data for...decision making, can you say that? Taking perhaps

Buyer: Gather data to take decisions is perhaps better

Practitioner: Another thing is, if you collect data like this in a central hub to avoid redundancy there should also be a point in having traceability in the data, for example if

management says “well, it says a million something here, where did that come from? This looks suspicious” to easy be able to go back in the system and locate the origin of the numbers.

Buyer: Improve traceability!

Practitioner: Yes

Buyer: It also helps the accountants in their work... What are they called?... A review is being done upon you... I know this, I am going to look it up on my computer.

Practitioner: Did you find anything?

Buyer: Audit!

Practitioner: Making it easier for audits, making audits more efficient!

Buyer: Yes, it looks good now, doesn't it?

Practitioner: In that case I guess we are done here

Appendix V – Transcription of final workshop

Practitioner:... This was the old activity model that we agreed upon, but after I looked a little bit further on it by myself I thought we might make some minor adjustments here. Basically the suggestions that I suggested is first of all to make one relationship here in one way, because with the “interact and accommodate other reports” we have this common data layer, we shouldn't really need to have anything going back from those reports, it should be just in one layer, so basically when we put it there we shouldn't need to make any adjustments with it, but that's just a suggestion, if you agree with that?

Buyer 2: Yeah, that's fine

Practitioner: And also the relationships here, before I only had one relationship going this way and this whole lot was supposed to be the embedded system, and I thought when I looked a little bit further that interact with other systems should exchange, we shouldn't only receive data from other systems, of course we should exchange in both ways, so that's the adjustments that I made

Buyer 2: Ok

Practitioner: And also... Here I made only one relationship going this (way), “interact with other systems” and then “produce reports” and then “review reports” and I thought we shouldn't need to interact with other systems just to product reports, it should come directly from the system so I made a line directly from the system

Buyer 2: Okay

Practitioner:... Yeah, that's it, that's the changes I made

Buyer 2: Okay

Practitioner: And if you agree with them I am going to stick with them, but if you disagree

Buyer 2: Yeah... no, it seems okay!

Practitioner: Good!... I don't remember really how far we got when you were attending the workshop?

Buyer 2: I think we nearly finished and we was...

Practitioner: We were nearly finished but where exactly... me and Hans filled out the remaining spots here, we were almost like, yeah I don't think we had more than 3... I don't know if we should wait for Buyer 3....

...

Practitioner: Okay, interact and accommodate other reports... discrepancy between...you were there when we wrote that one

Buyer 2: Yeah, when we did that one

Practitioner: And produce reports, do you remember if you attended that one?

Buyer 2: Yeah, we got that

Practitioner: Interact with other systems, that's probably as far as we got

Buyer 2: Yeah!

Practitioner: Yeah, what we are doing here, were you attending anything of this one?

Buyer 3: I don't think so

Practitioner: Yeah, that was the one me and Buyer 1 and Buyer 2 worked with during the last workshops and also I might just run this through you, I made some adjustments here also in the old systems model that we agreed upon that when I looked a little bit further on I thought I might spot some problems here. And the first one was that I had this relationship going both ways

Buyer 3: Yeah, yeah, have one...!

Practitioner: Yeah, I changed it into one, because, yeah, it shouldn't get anything back since it is a common data layer and also this one I thought was not right because we had no relationship here to the system that this symbolize.

Buyer 3: Yeah

Practitioner: And I thought this, "exchange data with other systems" should exchange data in both ways because we probably need to send some data and receive some data and yeah... and also this relationship "interact with other systems" to "produce reports" I thought, no wait, that's not right, of course it's the system that produces the reports, not interact with other systems. This relationship should go this way and I should remove this one.

Buyer 3: Okay, good!

Practitioner: So that's the only changes that I made so if you agree with that, that would be good.

Buyer 3: Yeah

Practitioner: Yeah, good, okay, we had two workshops when we made this one where Buyer 1 and Buyer 2 attended. And that's basically when we made most of it. But the last workshop where only me and Buyer 1 attended we finished up with the last two and half activities or something like that. So yeah, maybe we should start, do you want to get a hang of this a little bit from the start or?

Buyer 3: Please continue and I will try to follow

Practitioner: Yeah, okay, it's a little bit tricky to get everything into one slide. Okay, what me and Buyer 1 added here was calculate base data. Maybe I should start with the first one that is how the activity is done. Produce reports, calculate base data, basically everything we gathered around in our data layer or database and we should have everything there and then we calculate that in the way needed to produce the reports needed for whoever is going to receive it. And the measure of performance here for produce reports should be presenting the numbers in an appropriate way for the receiver.

...

Practitioner:...And information needed to carry out the activities is data from buyers and VCC systems. Yeah I guess you can put that in a ... from two perspectives there, because basically you are going to produce reports from the data you have gathered so you are really taking that from the data layer that's gathered but to gather that data layer you need to have data from buyers and VCC systems, so I guess you can look at it from both ways, but the ... was that we will write out the root cause of the data...

Buyer 2: Yeah

Practitioner: Information support provided by buyers, of course, manufacturing, volumes, take-rate...R&D, VCC concern. That's basically the data sources that we came up with.

Buyer 2: Mmm

Practitioner: And information GAP's and opportunities. Reliability and correctness of data is that. An issue and an opportunity is that we have everything sorted out in one place to avoid

redundancy and also Buyer 1 talked about monitoring of feature growth because of, lets see if I remember what he talked about, but basically I think what he talked about was that if we just stick with the that the buyer reduce the price of the parts that we buy it is not always certain that the car itself will get cheaper because new features are added because we have to keep the market and the customers happy and the car in terms of the features and the stuff, the parts added gets more and more expensive over the years and at the same time we reduce the costs for produced cars so he thought it would be interesting to have some kind of monitoring of feature growth to relate to... Buyer 1 would probably be able to explain it a little bit better...

Buyer 3: Yeah, I understand why he considers it troublesome.

Practitioner: Yeah

Buyer 3: Maybe it should be good to monitor the take-rate, sometimes for our ...

Buyer 2: Yeah, you can do that from SIPlus, oh, no, not the take rate.

Buyer 3: No, not the take rate, if it has increased or decreased.

Buyer 2: Yeah, it if was a system we could do that from that would be really useful.

Practitioner: Monitoring the take rate or so.

Buyer 2: Take rate increase or decrease

Practitioner: Yeah, we can add that!

Buyer 2: It must be a system because marketing gave me a print-out the other day

Buyer 3: There probably is a system somewhere

Buyer 2: Yeah

Practitioner: Alright, I guess it's true that reporting has got to have that as well. Alright, yeah! I should mark that out somehow so I remember then, what we changed this time, underline, no bold! Now I can remember what we changed, yeah! And also another thing was creating a common platform for exchanging needs and possible improvements for finance and PCR report responsible's because basically the problem is to understand how the finance conduct when they make their reports, what algorithms they are using and that it would be really useful for everyone in some way to create a platform for exchanging the needs and working together and get everybody do understand what each other is doing so we can help out instead of trying to figure out what we are doing here.

Buyer 2: Yeah

Practitioner: Yeah, so...weren't you here when we talked about this?

Buyer 2: Yeah, I think so...

Practitioner: And interact with other systems, the system exchanges data with other systems was how the activity is done and measure of performance is that the right data is received in a timely manner.

Buyer 2: Mmm

Practitioner: It doesn't have to be lightning quick but has to be decent quick so it's useful.

Buyer 2: Yeah

Practitioner: Yeah, that was the measure of performance we came up with. And information needed PCR and finance, those were the departments that we need to interact with, I don't know if you want to add something like R&D?

Buyer 2: I think the "ÄT" is what we get the information from. Its not really having a connection to KDP is it? No, no, it's okay

Practitioner: We will stick with it?

Buyer 2: Yeah!

Practitioner: Yeah, and information support provided by finance and manufacture and when he mentioned manufacturing he was referring to Pecca and Mecca or they were called something like that. And what did he say here, I almost forgot, I think he wasn't really sure but he thought that there might be useful information in Pecca and Mecca about what, I think

what, yeah, I guess it has to do a little bit about the take rate, basically what we are producing.

Buyer 2: Mmm

Practitioner: He thought there might be a system with useful information but he wasn't really sure, just that it was possible. Maybe it was an opportunity. So that's why we added manufacturing here. Okay, carrying on, review reports, how it is carried out, management review the reports that we produce and the measure of performance, long term profitability is achieved, management receives reliable correct figures presented in an appropriate way and on time. Review reports, information needed, to review the reports we shouldn't need anything more than the data we have gathered to make the report of course.

Buyer 2: Yeah

Practitioner: And information support provided by none we concluded after a little bit of thinking. Because if we make this system we shouldn't have to have a guy standing over the shoulder and explaining what we did.

Buyer 2: Yeah!

Buyer 3: Yeah!

Practitioner: It should be easy to understand...so no information support needed for management. And the last one, information gaps and opportunities, enables employees to spend more time on commercial work while improving the liability of data, giving management the right data to take decisions and improve traceability and yeah, basically when we get that data we shouldn't have to run around and do some detective work to find out where it came from. It should be easy to trace the data, these things are due to that, yeah, x and y and...

Buyer 2: Yeah

Practitioner: And also for making audits more efficient for the accountants when they check up on, what they check up on, make them happy

Buyer 2: Yeah...

Practitioner: So, yeah, that's basically

Buyer 2: Yes

Buyer 3: I think we pretty much covered everything now

Practitioner: Do you know anything about Pecca and Mecca and what we can find there? No?

Buyer 2: No, we talked about it before but I am not actually sure.

Buyer 3: Pecca and Mecca is R&D's finance database or

Practitioner: Oh, I thought

Buyer 2: Pecca must be R&D and Mecca must be manufacturing, mustn't it?

Practitioner: Because I thought, or what Buyer 1 thought

Buyer 3: Is it only volumes?

Practitioner: Was that it was a manufacturing system

Buyer 3: Could be, I have heard of them but I have never been into them looking at some

Practitioner: That it was a production system for monitoring the production, I don't know really. Maybe he will pop up now, he said he was going to be 30 minutes late. While we are waiting for Buyer 1 perhaps we can check out this one. Consider internal and external environmental constraints, buyers input new affecting figures into the system for management approval and measure of performance for this activity, influencing figures is applied in a way that makes historical traceability possible. Establish working relationships between part numbers. Information needed, technical changes, raw material prices and currency fluctuation changes, manufacturing volumes, a lot of information supports, VCC concern, technical changes, R&D and suppliers for raw material and CPA capitalisation changes and

also unknown for currency. Maybe you have any suggestions for that? I think we talked a little bit about it but didn't come up with anything.

Buyer 2: No, I am not sure. I think the best idea is to speak to finance about that.

Practitioner: Yeah... and manufacturing volumes, information gap's and opportunities, finance states an algorithm for the financial report, its theme over all the information gap's and opportunities in different ways. Establish relationships between part numbers to enable historical tracking of changes and changes of part numbers. Separate the D&D charge from the part price. Enter new price details, gather data from agreements... and measure of performance is availability and correctness of data. And information needed, VCC systems, buyers....

(Buyer 1 enters the meeting)

Practitioner: Yeah, information gaps and opportunities, measurability of data and enter new price details and interact and accommodate other reports. Exchange and analyze gathered data from reports data sources. Measures of performance, data is exchanged properly and reported and redundancy is avoided and information needed for that is CPR and finance and information support provided by TVM and finance and information gaps and opportunities is discrepancy between purchasing and finance reports is an information gap and finance states an algorithm for the finance report is an opportunity here to avoid the gap. And we are back to square one with the produce reports.

Okay, Buyer 1, a suggestion here is to add monitoring of take rate as an information opportunity under produce reports. And yes, sounds good?

Buyer 1: Yes

Practitioner: And we talked a little bit about Pecca and Mecca also but we didn't really know what we were speaking about. But that was some kind of manufacturing system, right?

Buyer 1: Yes indeed, and it is feed, at least one of them is feed from SIPlus I think. Pecca that's the prices I think I am not so familiar with it but I think, do you know what differs Mecca?

Buyer 3: Isn't it Hans Andersson or him, aren't you sitting next to him?

Practitioner: Yes, almost

Buyer 3: He is a system guy, he can probably explain in better words...

Practitioner: But when we discussed this with Pecca and Mecca, what were we going to get from those systems? What take-rate or what? ...

Buyer 3: What was the head of that?

Practitioner: The head of this column is information gaps and opportunities...

Buyer 3: Did we write it in? Pecca and Mecca? I think at least from where I come from it is... it is very difficult to make correct predictions when you don't know the historical data and from this you can get lots of historical data about what we have produced earlier.

Practitioner: So the take-rate in history so to say?

Buyer 3: Yes, for instance, take-rate! Could be used to calculate average give away cost on EDS I would say, produces for a lot of purposes...even take-rate, you can guess future take-rates but if you have no idea how it was in the past it becomes even more difficult. If you then don't have a clue, you can at least state how it has been in the past. That is no data that we ever are being feed with.

Buyer 3: But really that are something that you would need in any of all our systems.

Buyer 1: In that case you could yourself choose a timeframe, what percent have had during this timeframe. I think that would be very useful.

Buyer 3: Especially for yearly negotiations so you can check if the take rate is higher than what we have in our agreements, if it is higher it is very useful in a negotiation.

Buyer 1: All data is already there

Buyer 3: It is just a matter of retrieving it in the right manner, in a structured manner.

Buyer 1: I mean, I can imagine that there is a few established reports... you want to be able to choose a timeframe yourself and gather instead of being informed that during 2008 there has been a 9% take rate on this item, the curve could have gone like this, how did it look after the ÄT for example? Did it go up or down or what happened? I think that would be interesting analyze that kind of numbers for the purchasing department.

Practitioner: So in principle it is what is used in the production that is available there?

Buyer 1: Yes

Practitioner: You talked about EDS there too, what is that?

Buyer 1: EDS is cables, but what difference is between Pecca and Mecca, one of them I think is, I don't know.

Buyer 3: There is no point in guessing, it is better just to ask Hans or someone who knows.

Buyer 1: Yes

Practitioner: It doesn't really matter so much in one way because this symbolises the buyers what we have written down, so that you do not know about or have been informed about Pecca and Mecca is an information gap in itself.

Buyer 1: Yes

Buyer 3: Yes

Practitioner: So that's not the end of the world

Buyer 3: Interact with other systems, Procost for example

Buyer 1: That is a terrible system!

Buyer 3: If that could communicate with SIPlus better, maybe they would have updated numbers over at R&D. That would be of tremendous help.

Practitioner: What is?

Buyer 3: R&D has Precost and Procost that is two price systems and they use one of them in the beginning of the project and one when they start the production, right?

Buyer 1: Yes

Buyer 3: Or at least during some milestone they switch from Precost to Procost. And those systems is loaded

Buyer 1: They are feed manually, right?

Buyer 3: Yes, manually and is not loaded from SIPlus, which one got the right numbers? So they can have totally wrong prices away at the Precost and Procost systems.

Buyer 1: SIPlus doesn't necessary need to have the right prices.

Buyer 3: No, it doesn't have to be that way but it is often more accurate than what they have entered manually over there.

Buyer 1: Yes, with a few exceptions.

Buyer 3: There are always exceptions

Practitioner: But these, pro and pre, they are using them, when are they using them?

Buyer 3: Oh, they got that for their budget work

Buyer 1: Yes, project calculations

Practitioner: And this was the only one we changes to... take rate, maybe I should run that through you also with the, I made some adjustments... to the activity model. Lets see here, this was the one we agreed upon but when I looked a little bit more on it by myself I thought that we had maybe some small problems here, and first of all we had this one with the relationships going both ways here and I thought maybe that's not correct...

Buyer 2: ... round and round you go, ha-ha!

Practitioner: So the system should only accommodate add reports to PCR and finance, should only go that way. I thought we shouldn't need to get anything back if we have just one common data layer, it should sufficient to accommodate their needs. And also we had this relationship going that way and this one trying to symbolize the system... and I thought interact with other systems, that should probably be data exchanged in both ways because we

probably need, if we have this common data layer we need to both retrieve data from other systems and they also probably need to get something from us to make everyone happy. And also this one, we have a relationship going from interact with other systems to produce reports and I thought, wait, hold on a minute that is not correct, it is the system that produces the reports not the interact with other systems, that is not what produces reports, it is the system so the relationship should go that way, and not from here to here but from here to here. So that's the changes I made. Suggestions, comments and question!?

Buyer 1: Mhm

Buyer 2: No

Practitioner: Looks alright?

Buyer 2: Yeah, it looks good...

Practitioner: Yeah, I don't know, that is basically it. That's everything because we didn't make any changes what I can remember to anything else me and Buyer 1 to the PQR and everything, we just stuck with it.

Buyer 1: Yeah

Practitioner: So I shouldn't need anything more from you... this is it!

Buyer 3: Then we will wish you good luck with the examination...

Practitioner: ... Thank you!