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Cornerstones in Developing Forecasting Tool

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The purpose of the current thesis was to identify the key elements in developing a forecasting tool. The case company is a subsidiary of a steel corporation and operates in the Nordics and the Baltics. It is a distributor specialising in stainless steel, nonferrous metals and carbon steel products with approximately 1100 employees. The company has been formed from a merger between two separate companies which has led to two different forecasting processes. The management of the company decided that in order to align the processes and to add more visibility to the forecasts, the forecasting tool, EffectPlan, that had been previously used in one of the companies would be developed to include all forecasts.

The study used mixed qualitative research methods, such as personal interviews, and a pilot study project. Altogether 19 in-depth interviews were conducted to gather data from internal and external experts. The pilot study was conducted to study functionalities and the capabilities of the EffectPlan tool, as well as to test the tool. The theoretical framework focused on forecasting processes, Sales and operations planning (S&OP), project management as well as change management.

The findings showed that combining the forecasts is not easy. The findings from the pilot study showed that EffectPlan forecasting tool needed to be developed to correspond to the company's business needs.

A major finding showed that some interviewees thought that development made more sense when done after another bigger investment, the ERP implementation project. Other research findings showed that the key elements in developing a forecasting tool were project management and the handling of business change. There was also a lack of communication and a misunderstanding in the pilot study project. External expert interviews revealed that communication and proper planning were also vital elements in the development of a forecasting tool.

The researcher recommends that the forecasting tool development model includes project planning and management, change management and communication activities. The researcher recommends that the plan is put into action by holding a project initiation workshop, where the important aspects are discussed. To gain real benefit from the forecasting tool, the forecast solution should be built on EffectPlan. The researcher also recommends that a communication and training plan is created to include all stakeholders in the project.

Keywords	forecasting process, forecasting tool, S&OP, software development, business change, change management, project planning, project management, change communication
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1 Introduction

What are the elements in forecasting tool development in the era of business transformation? Technology takes modern development forward and brings constant changes into our lives. This not only has an effect on the consumer market but on many business to business (B2B) companies around the globe. At the same time, as competition is growing increasingly intense and unexpected economical changes are always just around the corner, technology is driving the world. Companies must come up with new ways to ensure the availability of goods and reliability of service to the customers. There is a constant struggle to stay in the game and keep up with the speed at which the world is turning.

In order to thrive, businesses must find more efficient ways to maintain the level of customer satisfaction, improve processes and develop new and enhance existing ones. In fact, continuous improvement efforts have become an important part in business development.

The rapid speed is also causing companies to react quickly. This causes a lot of unexpected work and sudden extra work tasks. All this speed and unplanned development work can also cause a lot of confusion in organisations. So what is the cause of the sudden changes and is the speed always the most efficient way of reaching the required target? What are the obstacles to development, especially when business processes are complex or when there are different working ways?

This thesis research studies the fundamental factors in forecasting tool development. The research examines the vital matters in tool development and how to proceed when there are two different forecasting process models. What happens in constant changing environments and how will people be affected? Is the development about having the most powerful engine and the latest technology, or about people in the change? These are the questions that this study seeks to answer.

1.1 Overview

Simply put, the main purpose of forecasting is to acquire as accurate a forecast of customer demand as possible. The demand from customer is the anchor that steers the planning of operational activities in a company. Although forecasting is based on historical demand and is always a prediction of the future, an efficient forecasting process can help a company to better meet its customer needs and requirements and even to improve customer service level in the long run.

1.2 Case company

The case company is a subsidiary of a steel corporation. The company is a distributor of stainless steel, nonferrous metals, and carbon steel products and operates in the Nordics and Baltics. Turnover in 2017 was SEK 7,821 million and the company has approximately 1,100 employees in 7 different countries. The head office is located in Sweden.

Purchasing and inventory management (PIM) is an organisation that is responsible for ensuring the supply of goods and services according to customer demand at the right time and place in the Nordics and Baltics. The PIM organisation ensures customers are supplied with goods and services of the highest quality and quantity according to the sustainability standards of the corporation in the most cost-effective way. PIM consists of three different procurement product line categories managed by three category managers and purchasing line organisations consisting of senior buyers and local purchasers for each production unit or as called service unit. PIM also includes cross functional support units that operate across the whole company. These include inventory management and two procurement process development units.

Cross functional support units are in charge of planning and developing procurement and inventory activities and related business processes in the case company. Sales and operations planning and forecasting development is part of the support function's development goals.

Forecasting is used to set a baseline for financial budgeting and is an important process in planning the supply of material for the future demand in the case company. Forecasting also helps to plan production capacity and work hours used in the production process.

Forecasting is done monthly and it is regularly reviewed in sales and operations planning (S&OP) meetings.

Because the case company has been formed from two separate companies in result of a merger of a Finnish and a Swedish corporation, there are two different forecasting processes that exist in the company and the tools used in forecasting are different in the two organisations.

The two organisations in this thesis are hereafter discussed as Oy meaning the Finnish organisation and Baltics and Ab meaning the Swedish organisation as well as Norway and Denmark. The case company hereafter is defined as the whole company operating in the Nordics and Baltics. Since the forecasts in Oy and Ab are generated in different ways, they are discussed hereafter as FIBA meaning Finland and Baltic forecasts and Scandinavia, which includes Sweden, Norway and Denmark forecasts.

1.3 Business challenge

Because of the two different forecasting processes and tools and systems, it is challenging to review forecasts at the company level. This especially causes a challenge when forecasts are examined for supply planning from the PIM perspective. It is difficult to examine demand at the company level when different calculations methods are used and when different products are included in Oy and Ab company forecasts.

Moreover, this causes challenges with planning supply chain activities. In order to be able to review the forecasts together, have more visibility and transparency of the demand, development work is needed.

1.4 Objective and scope

It was decided that the forecasting tool used in Ab company would be developed to also include the FIBA forecasts. This was thought to ensure a more unified view and transparency of forecasts and would help in developing the overall forecasting process in the case company.

The objective of the thesis is a development plan for combining FIBA forecasts into the forecasting tool called EffectPlan.

The purpose of the research is to identify business and data requirements needed in order to reach the end result of having FIBA forecasts in the tool. Furthermore, the focus will be on studying how the tool can benefit PIM. The aim is to study the technical requirements, data needed, business requirements, resources and roles and responsibilities required to successfully develop the tool.

The findings presented in the thesis and the expected outcome of the thesis research are based on theoretical investigation and a study of current operations in the company. Although the research covers a review of company IT landscape, it excludes a detailed investigation of the business intelligence tools used for analysing and reporting forecasts. These tools are only briefly discussed in the thesis. The research is also limited to examining and building a sales forecast tonnage model in the tool. This is called a volume forecast.

1.5 Thesis outcome

The outcome of the thesis is a development plan for the EffectPlan forecasting tool. This includes a proposal of the plan. The outcome includes defining data and business requirements, guidelines for project planning activities, testing, training as well as the organisation involved in the development. The solution is built according to the case company practices and regulations, and industry-specific knowledge.

1.6 Key terms/concepts

PIM Procurement and Inventory Management

S&OP Sales and Operations Planning

ERP Enterprise Resource Planning

FIBA Finland and the Baltics

Scandinavia, Sweden, Norway and Denmark forecasts

Volume Forecast Sales forecast number in tonnage

B2B Business to Business

KPI Key Performance Indicator

CDW Common Data Warehouse

BI Business Intelligence

1.6 Thesis outline

This thesis is divided into three phases in which the research was carried out.

The first phase discusses the objectives and outcome as well as the plan of how the research was carried out. It covers the study of the current situation and pilot study of the EffectPlan tool. The first phase then continues with literature review.

The second phase is an introduction to the development plan proposal. This phase discusses the overall research findings and introduces the proposal for the plan. It also presents the preliminary outcome of the thesis.

Validation of the proposal is done in phase three. In this phase the proposal is reviewed and further developed if necessary. The final development plan is then presented as the thesis outcome. The final part of phase three contains the thesis conclusion part with recommendations for future proceedings.

2 Research design

2.1 Research model

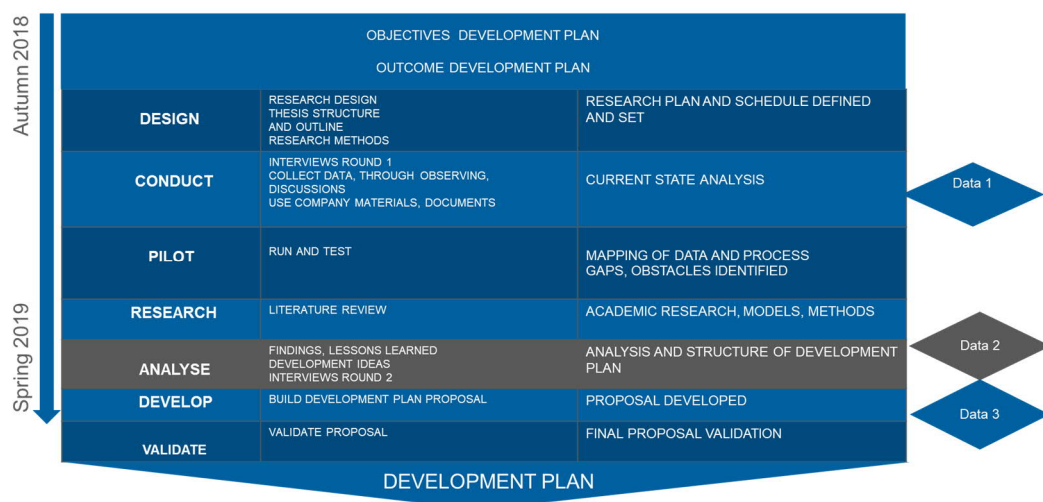
“A research without a pre-drawn plan is like an ocean voyage without a Mariner’s compass” Krishnaswami and Satyaprasad (2010, p.42).

This thesis is constructed of 7 separate stages that form the entire final thesis research model. The first stage defines the objectives and outcome, describes the outline of the thesis and stage two introduces the research plan. Stage three consists of research studying the present situation in the company. Stage four includes a pilot study. The pilot study presents a hands-on deep dive into the research, with a testing of the tool’s functionalities and capabilities. Stage five consists of academic research. This was done from autumn 2018 to summer 2019. Academic research was necessary already at the beginning of the research in autumn 2018 to understand the concept of forecasting and S&OP and to learn about the processes.

In stage six, work continued with building and developing the proposal. Finally, the last stage in the research was stage seven. This included the validation of the proposal which was at this point presented and discussed together with PIM.

Figure 1 illustrates the research model. Data collection for round 2 was done after the pilot study and is highlighted in grey.

Figure 1. Research model



2.2 Research plan

The research was done through mixed methods as applied qualitative research. The purpose of the research was to find a solution to an existing problem through a specific case study (Krishnaswami and Satyaprasad 2010). In this case by developing a plan and proposing a model that could improve the existing situation.

In-depth qualitative research was done by combining two main methods. Conducting personal interviews and participating in a pilot project. Company documents, academic literature and white papers, web sources, discussions with stakeholders as well as observations done throughout the research were also an important source of information. Evidence-based research was done with internal and external industry stakeholders, and combined with the theoretical examination.

The first phase was done by researching the current way of working and identifying the forecasting tool landscape through discussions and interviews with stakeholders. The second phase included participation in a pilot study. The third phase was done through a second round of interviews focusing on development of the thesis proposal.

The literature for this thesis has been chosen to cover an introduction to forecasting processes and methods. The S&OP process and its effects on forecasting are also examined. Forecasting systems and data entry tools are introduced to clarify the technical terms and concepts used. Project planning and project management are the main focus areas in the academic literature and also form an important theoretical framework for the solution proposal. In addition, literature on change management and communication is studied to identify success factors that advance business change projects.

2.3 Data collection and analysis

Data was collected from both internal and external stakeholders. The purpose was to gain enough insight knowledge to develop a proposal and to support the triangulation model in this thesis.

The first round of data was collected from October 2018 to April 2019. The purpose was to review current forecasting practices within the company and identify differences in the

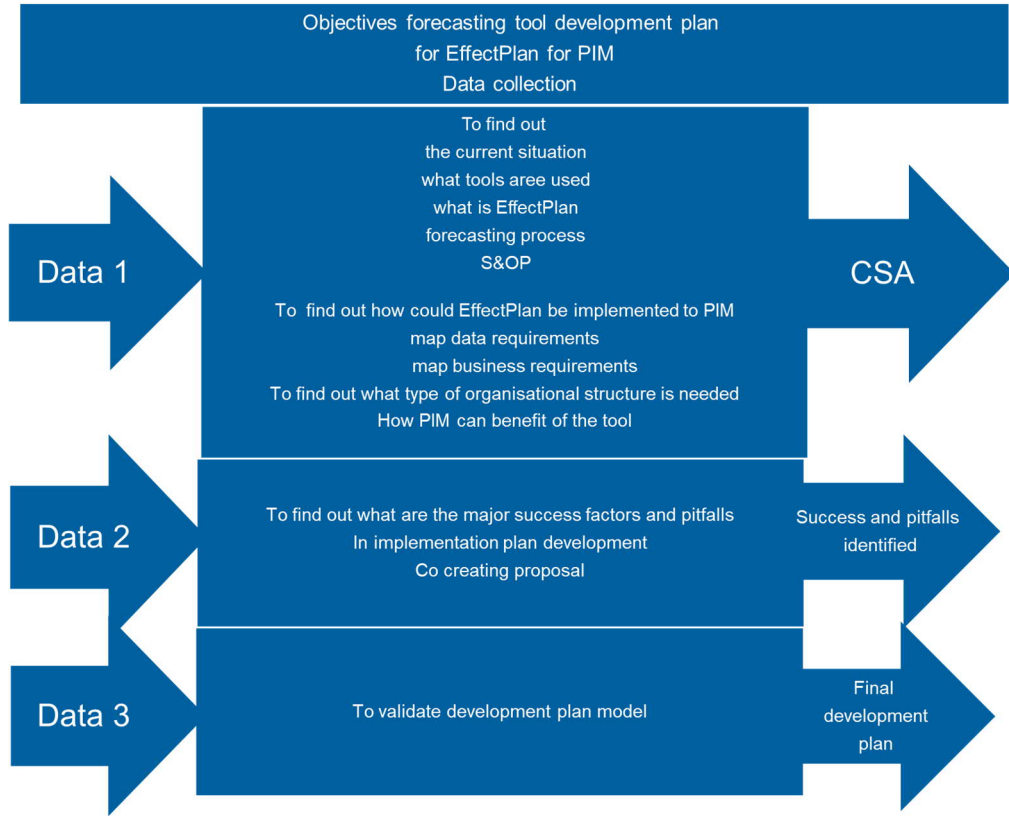
process and tools. Interviews were held with the personnel working with forecasting in Oy and Ab companies and with other reference group members that worked in cooperation with Oy and Ab personnel.

The pilot study was conducted from January 2019 to April 2019. The objective of the pilot study was to examine the minimum requirements to add FIBA to the EffectPlan tool and to gain an understanding of how the tool had been developed to function with Ab's forecasting process. Data collection in the pilot study was done through identifying and mapping data and business requirements in accordance with the existing EffectPlan volume forecast model. Data in the study was collected through observations, tool testing sessions, project findings and experience. The information gathered and observations made helped to gain an understanding of the key focus areas needed in developing the proposal. The pilot study additionally helped to pinpoint things that might have otherwise been overlooked.

The second round of data collection was during spring 2019. Internal and external industry experts were interviewed between April 2019 and May 2019. Interviewees were picked based on their background of working in similar manufacturing industries and having experience of running or being involved in software development projects.

The final proposal for the development model was validated in a workshop meeting, which was the data collection round three.

Figure 2 Data collection plan



2.3.1 Selection of interviewees

All but one interview was held through one-on-one interviews via Skype. One interview was a telephone interview in round 2 with an external expert. Skype proved to be useful as it enabled interactive connection and online demonstrations as well as video recordings.

Each interview was recorded and each session lasted from 30 minutes up to 76 minutes. The telephone interview was handled by taking notes throughout the interview.

The interviews were semi-structured with a few pre-defined set of questions, which left room for discussions and demonstrations that helped to deepen the know-how on the topic. The interviewee list and interview questions can be found in appendices 1-4 and round two data collection is discussed in chapter 6.

The target group for the interviews included professionals from Oy and Ab companies in Finland, Sweden and Norway involved with S&OP and forecasting in the case company or the corporation. These interviewees represented business, finance management, PIM management and category managers, a development manager and business warehouse management, a development manager from corporation side and finance support manager responsible for Oy S&OP and forecasting monthly preparations.

Interviews with external stakeholders included professionals with expertise in project implementations. The purpose was to collect information on key factors in software development projects.

Current state analysis was created based on findings from 15 interviewees. This followed research and analysis of the pilot study. Co-creation of the proposal is combined from current state analysis, pilot study findings, the theoretical framework and discussions held with six professionals during development of the proposal.

To begin with, interviews were conducted to study the entire forecasting process in the case company. For these interviews, the questions were categorised into three different sub topics; the current way of working, obstacles in the forecasting process and future

opportunities. This helped to gain a clear picture of the process and to find out the general feeling about the development practices. The question template can be found in Appendix 2.

Interviews continued targeting the EffectPlan tool and the implementation that had been carried out in Ab in Sweden and Norway. The purpose was to gain a thorough understanding of the tool's features, capabilities, usage and the EffectPlan forecasting process. At this time, the research also focused on the development requirements such as data and business process requirements and hence the questions were specifically targeted. These interview questions can be found in Appendix 3.

2.4 Validity and reliability

The thesis was carried out as part of development activities run in the PIM organisation and thus by hands-on, action-based research. The validity and reliability of the research were achieved through the triangulation method. As Lincoln and Guba (1985) state, credibility and trustworthiness are two factors to be considered when collecting and analysing the data and presenting research findings. Hence the aim has been to collect data from academic sources as well as from industry experts and/or through process examination in the case company.

The triangulation method used in this thesis enhances the credibility of the results and trustworthiness of the information stated in the thesis. Triangulation presents sources from three different points of view (Saldana, Leavy and Beretvas 2011). Therefore the theoretical framework, current state analysis, pilot study and industry expert interviews are included as evidence-based data. The material presented and used in the academic research is peer-reviewed, industry-specific literature.

Validity and reliability are achieved through assessment of the preliminary findings made during personal interviews. (Saldana, Leavy and Beretvas 2011) For instance the current forecasting process flow models were drawn out based on the verbal explanation during the interviews and then sent to the participants for validation. Data collection and test data used in the pilot study was validated together with the pilot study project team. The proposal for the development plan was built and developed based on the data findings, and validation of the model was done in a workshop by presenting the model and findings to the management of the PIM organisation. The charts and models used in this thesis

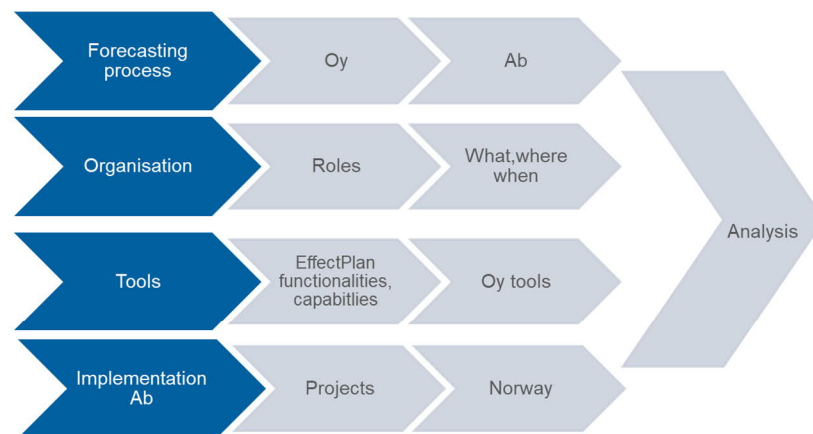
are actual models that were used in developing the plan. They have been validated by requesting the experts to check that the drawings are correct. Actual citations have also been used based not only on academic sources but also on collecting data from internal and external industry experts.

Several methods in data collection proved to be an advantage in the research and hence also increased its trustworthiness (Saldana, Leavy and Beretvas 2011). In fact, the pilot study was useful. Initially, it was thought that the major emphasis would be on the technical requirements, roles and implementation process but the study findings suggested that there were other major obstacles which might even prevent execution of the development plan altogether if it was put forward as such. Therefore, through the chosen multiple research methods, the findings in the research provided a wider spectrum of the diverse perspectives, as also recommended by Saldana, Leavy and Beretvas (2011).

3 Current state analysis

The research in this phase comprises a study of the organisation's roles, responsibilities, S&OP, tools and forecast data management, and forecast processes used in the case company. It therefore incorporates an investigation of how the forecasting is done, who is involved, what is included in terms of the tools and data set, organisation and process and the implementation practices, involvement of the organisation and data and business specifications. The outcome is a current state analysis.

Figure 3. Current state research and study of four major topics



3.1. Forecasting process in the case company

Volume forecasting in the case company equals the volume of sales tonnages. It is complex. It consists of actuals which are the historical sales numbers, a sales forecast that indicates the market demand and a demand forecast that is used by PIM to plan the supply of items. When discussing demand forecast from now on, it is important to recap that it is a forecast for planning the supply of items. It is derived from the sales forecast that indicates the real customer demand from the market.

The forecasting process runs monthly and it is reviewed in S&OP meetings. The S&OP meetings are held mainly at a country level and hence Oy and Ab meetings take place

separately. Top management also reviews forecasts at the case company level and reports the results to the corporation. S&OP meetings are attended by sales area managers, the finance manager and country manager who hold a review meeting where the final forecast figures are agreed.

Figure 4. Forecasting process in the case company:



3.1.1 Forecasting in PIM

Forecasting is important for the PIM organisation, which manages the Nordics and Baltics for the supply of goods in the case company. Through the forecasts, PIM does the planning for procurement activities; levels of inventory and purchasing of goods.

The demand forecast contains more detailed information and is split between production plants called service units. Demand forecast is naturally important to the whole PIM organisation but especially for buyers and senior buyers. The forecast serves as baseline data for the inventory plan report, where demand figures are viewed weekly and which serve as a basis on which to plan purchases.

Demand forecast

As previously explained, PIM views forecasts to plan the supply of items. In Oy, the demand forecast, which is derived from sales forecast, also contains information about the volume of scrap produced. Scrap means the material that is left over from production of products. Forecasts are also divided by service unit. The end result shows the forecast for all service units in Oy including other stock reservations from other business divisions in the corporation.

Demand forecast calculation in Oy:

sales forecast+ scrap goods
per service unit

Overall, the demand forecast is essential to both Ab and Oy companies but it is derived differently.

Questions about the development of the forecasting process in PIM were also asked and the overall feeling for further development activities appears to be positive in the PIM organisation. This was also stated by one of the category managers, who said that since forecasting and S&OP are fairly new there is a room for improvement.

3.1.2 Defining Forecasting practices in Oy company

The business model in Oy is different from that of Ab due to the earlier merger. Although the product offering may be similar to some extent, Oy has an additional product business called parts that is significant to the company. On top of that, the tools used to generate forecasts are different. Furthermore, when it comes to generating forecasts, there are differences in the information and data collected. Altogether this causes a major challenge in developing the forecasting tool.

Data and ERPs

When looking at the present situation, it can be said that already baseline static data that form the forecasts differ in the FIBA forecast model. Already the system template in the ERP system differs. This consists of system processes and master data such as orders, deliveries and invoicing, and the actual process in the system. In addition, since product hierarchies, product groups and sales area data, etc. have been set to align with the business prior the merger, they vary. Hence, the data that is used to generate forecasts varies from Scandinavia forecasts.

Having two separate ERP systems between Oy and Ab is another challenge. Simply because the data are different and cannot be easily combined. This is because to build forecast data sets, the master data from the ERP system and the time period forecasts are planned in different ways. The way forecasts are generated, what is included in the forecasting and what data is imported from different systems varies. In Oy sales for the past 12 months are used to generate forecasts.

Common data warehouse

The common data warehouse platform, CDW, has been developed by corporation resources. CDW is a database which consists of various types of data sets that are harmonised to fit together by key identification field/s. Although FIBA forecast data includes data from three different ERPs and there are two system solutions existing in the Baltics, the data has been harmonised in the CDW. This means it can be easily exported and combined to generate forecasts. In fact, the actuals used in building the forecasts in Oy are exported from the common data warehouse.

According to the controller in PIM, the CDW has been built to support the harmonisation of data in the whole corporation. The corporation requires information to be available for reviewing and analysing the total number of sales, volumes, etc. and hence the data warehouse is also an important strategic tool.

3.1.2.1 Outlook of the FIBA volume forecast process in Oy

Volume forecasting model in Oy company consists of gathering of data on FIBA actuals and handling and processing them in multiple excel queries. This is a vast amount of data and done by one administrator. The data is first gathered from the CDW and then processed via multiple calculations and formula queries in Excel. It then forms the historical sales data; actuals. Actuals are the basis for sales forecasts as they show the previous month's figures of what has earlier happened; in a time series it is the past 12 months of sales. It is split into sales areas. The current way of generating forecasts is through an Excel template and includes the value in terms of money (EUR) against the amount of sales tonnage. This information is essential for sales, finance and country management in Oy as they mainly look at the value of tonnages instead of volumes sold.

When the actuals template has been prepared, it is posted onto a company intranet site SharePoint, where area sales managers enter their estimates and figures for the following month's sales forecast. This happens in the middle of every month and once the entries have been made, the administrator combines the sales forecasts together by running another Excel power query. At this point the query run updates excel report views that show the new sales forecast. Once this step has been done, the administrator runs another query which updates the demand forecast for the PIM organisation.

3.1.3 EffectPlan volume forecasting process in Ab

EffectPlan is a forecasting tool and foremost data input tool that was taken into use in Sweden approximately a year ago. In Ab company, it is used to do financial budgeting and forecasting, and entering volume sales forecasts. EffectPlan is available through an online portal. Unlike in Oy model accessing, the tool can be used simultaneously meaning multiple users can update and save their changes at the same time into the tool. The files are not stored on an individual's computer either. Also sharing forecasting information and viewing forecasts is easy. EffectPlan tool is administered by Ab's finance controller.

The forecasting process is built around the tool and runs monthly. First the administrator of Ab prepares new actuals by creating a new file and updating the data from previous months. The actuals data in EffectPlan is updated from Qlikview, which is the business intelligence tool used in Ab and also consists of Ab's ERP data.

The process is done automatically with a built-in data template. The data can also be imported to EffectPlan manually. Once the actuals have been updated, the sales forecasts are entered directly into Effectplan by Ab sales managers known as product managers. Updating of sales forecast can also be done by using a mass import excel file. Once the forecast is ready, it is reviewed and adjusted by Ab's management and finance organisation to which the administrator also belongs to. After this, the forecast is closed and the new forecast is updated and available for review in Qlikview business intelligence tool.

EffectPlan automatically imports the forecast data into Qlikview, where the information is viewed through built-in reports. EffectPlan can also be used to view the forecasts but since Ab personnel uses Qlikview for reporting, visual reports are not used in EffectPlan. PIM on the Ab side also uses Qlikview.

According to the finance manager, EffectPlan enables a fairly easy way of combining forecast data together in Ab. The data is imported to the tool according to a data template. It is easily done, as long as the data is harmonised and corresponds to the template.

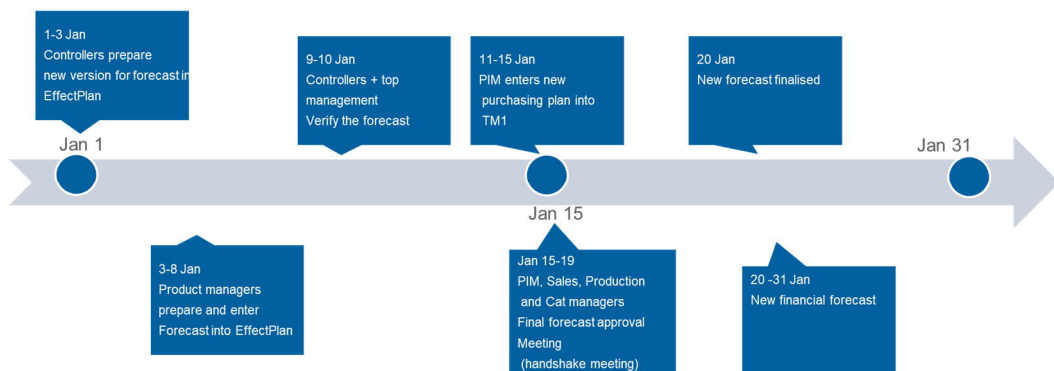
The tool enables a common communication platform for sales also as they can insert comments into the forecast rows for others to view. For example, when there is an increase or decrease in sales forecast.

As mentioned above, EffectPlan can be used to view forecast information but the reporting tool Qlikview used in Ab companies is the main tool that users log into when reviewing forecasts. There the Effectplan forecast data are consolidated into reports.

An interview with the administrator of the tool in Ab established that EffectPlan has helped to reduce a number of data sources that were previously used because since sales enter forecasts directly into the tool and no other consolidation of data is needed.

EffectPlan version handling is also straightforward and easy. Each month, the controllers run a new version of the actuals data on a data template and the product managers then enter the new sales forecast directly into EffectPlan. After this, the sales forecast is verified in a management meeting and the figures are ready to be reviewed in the reporting tool Qlikview. Forecasts are reviewed in tonnages per day.

Figure 5. EffectPlan volume forecasting process and S&OP



3.1.3.1 Differences in Ab and Oy IT landscape

As explained, there are differences in the tools and systems used and how the data is imported for forecasting. To understand the technical requirements, the following table was made to list the tools and systems.

Table 1.

Country	ERP	Data gathered from	Forecasting report tool
Finland	SAP Oy	CDW, Sharepoint site	Excel Power query
Baltics	iScala	CDW, Sharepoint site	Excel Power Query
Sweden	SAP Ab	Qlikview-->EffectPlan-->Qlikview	EffectPlan, Qlickview
Norway	SAP Ab	Qlikview-->EffectPlan-->Qlikview	EffectPlan, Qlickview
Denmark	SAP Ab	Qlikview-->EffectPlan-->Qlikview	EffectPlan, Qlickview

To understand the flow of the forecasting process and the tools and systems associated with it, an IT landscape map was created. This helped to distinguish the differences at a detailed level. The map indicated where the data is imported into the forecasting tools (shown in the centre) and how the data is then used for consolidating reports. The map covers the whole forecasting process. In figures 6a and 6b, the research area in the IT landscape is highlighted with red circle.

Figure 6a. Oy

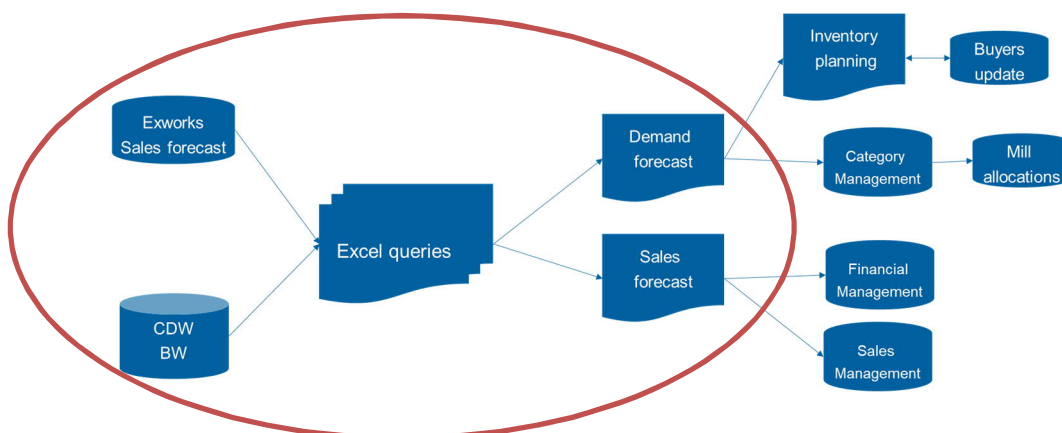
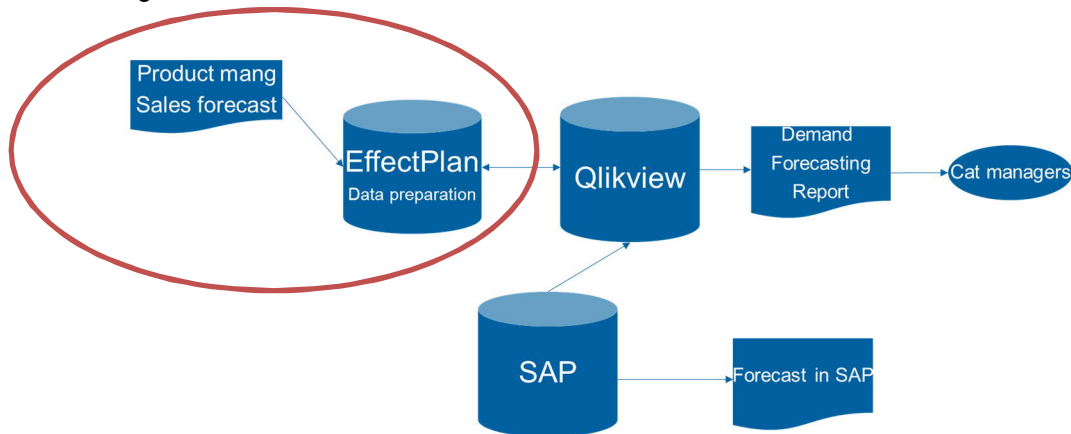


Figure 6b. Ab



3.1.3.2 Possible barriers affecting development

When interviewing the stakeholders, it became very clear that having different ERP systems causes the main challenge in the development of forecasting, especially when the tool EffectPlan is considered. Because the tool was initially built to align the existing Ab processes, the volume forecast template is built based on the Ab requirements. As has been explained earlier, because of the two major SAP systems, there are difficulties in combining the forecast data. The finance support manager in Oy company pointed out that because of the different product hierarchy, for instance, the product groups and areas differ. He then added that until there is the same ERP system set-up in use in Oy and Ab, it will be difficult to harmonise the forecasting process in the case company. In his opinion, the firm should wait for the Oy company ERP solution to be implemented into Ab solution first. This way the forecasting can be developed a lot smoother.

In fact one major obstacle is a planned ERP implementation project in Oy. The existing ERP system in Ab has been planned to be brought in use in Oy also but unfortunately there have been significant delays for a number of years and the project has not yet even started.

Since there is a new time plan, the general opinion raised in the interviews was that development of EffectPlan should be done after the implementation. It is thought that the same ERP system would mean there will no longer be that many differences with the data sets, product hierarchies and product groups once the systems and solutions are combined.

ERP implementation can certainly affect the development of forecasting. Both administrators agreed that it would definitely be easier to do any development work after the ERP implementation but the administrator of Ab strongly thought that development should not be done before the Oy solution has been combined or build into the Ab ERP system. "As long as we have two different ERP systems, there is no use in developing Effectplan to include FIBA forecasts," he quoted.

On the other hand, in another interview with a controller from PIM, the interviewee stated that although two ERP's pose a challenge, the data can be harmonised. He added that because the corporation strategy includes monitoring all business unit data, the corporation business warehouse team has built a common data warehouse solution. This solution is a database that extracts data from multiple sources, harmonises, and combines data. This means that data such as product hierarchy can be combined. Also part of Ab company data is already built in there. Hence the data is available or if part of it is missing, it is not a problem to implement it there. He commented that although resources are scarce on the case company side, there are more resources on the corporation side that can help and data harmonisation can be done, he explained.

3.1.4 EffectPlan implementation Ab

Effectplan was originally implemented to run the Scandinavia forecasting process more efficiently. The first implementation included forecasts in Sweden (Sweden and Denmark forecasts). Then later on Norway implementation was also done. The reason there were two separate implementations were because the Norway solution was slightly different.

EffectPlan implementation also included redefining the forecasting process in Ab company as well as development of S&OP. It also changed the way of working and roles and responsibilities of the parties involved. The end result of the forecasting S&OP process model was built around the new tool and this model served as a template when Norway forecasts were added. The tool was also implemented to the PIM organisation but partly as FIBA forecasts were excluded from the scope.

Implementation included developing an EffectPlan tool to correspond to the existing forecasting process and systems. Hence the EffectPlan data requirements were mapped against the existing Ab ERP system as well as the existing reporting tool Qlikview. The tool developer was the finance controller from Ab company and the tool set-up and data templates were created together with an external consultant from EffectPlan.

EffectPlan implementations both in Sweden and Norway were done as a small scale project and appears to be that it was done as part of a continuous development effort alongside other duties. The majority of implementation activities and EffectPlan data templates were defined during Sweden implementation. Norway implementation was hence done by adding the Norway forecasts to the tool accordingly.

Defining the needs and requirements was done in meetings held with sales and finance to plan and build the sales forecast template and then with PIM to discuss their requirements. The project plan was communicated and discussed in meetings.

Forecasts in EffectPlan are built in different levels, which means that different functions can benefit the forecasts at the top level and/or by having a more detailed view or going into specific information. Collaboration with the PIM development manager based in Sweden was done when building a more detailed forecast level for PIM but the scope included requirements for Ab's business only.

Today, EffectPlan is used to handle forecasts in the Scandinavia market area. The only forecasts missing are FIBA forecasts and this is because of the differences in the business requirements and the differences in the monthly forecasting process run in the Oy company.

3.1.4.1 EffectPlan implementation in Norway

Norway implementation was studied to reflect on the activities associated with the development and to get an overall picture of the EffectPlan usage in Norway. It turned out that in Norway only a few people were involved. The finance manager in Norway had the main role in adding Norway forecasts to the tool. He was interviewed in late autumn 2018. Later follow up discussion was held via email in spring 2019. In addition, sales personnel including a sales manager and sales executive were interviewed about EffectPlan implementation and the current way of working practices in autumn 2018 and again in spring 2019.

Norway started using EffectPlan in spring 2018. The users include sales and finance. The monthly process is similar to Sweden except that there are a couple of manual steps the finance controller does when preparing the forecasts.

When interviewing the users about EffectPlan, the finance controller in Norway seemed happy about the way in which the tool functions but thought that there is a challenge when trying to view the product articles. Sales in Norway were of the same opinion but in addition thought that also more training would be needed. Although the EffectPlan tool seemed good, the sales manager quoted “there is one forecast in use and therefore it provides one view and therefore more understanding is needed on the capabilities and functionalities of the tool”. Both sales and controller agreed that the information was still at the top level and more forecast model development was needed.

3.1.5 EffectPlan usage in PIM

The study of how PIM used EffectPlan was mainly done through company documents, materials and observations in the meetings. Additionally Skype interviews were held with category managers and with the senior buyer based in Sweden. As it was already anticipated from interview sessions with PIM, the senior buyer did not use the EffectPlan tool directly. Instead she used Qlikview for reviewing and analysing forecasts. She reviewed the demand forecast information directly through a report that showed the EffectPlan information as well as demand forecast information derived from other data sources such as the ERP system. She also used a tonnages per day forecast when FIBA forecasts were reviewed as tonnages per month.

The senior buyer reviewed the forecast figures with the category manager and sales at the beginning of every month and also followed up on the consumption history daily. There was no communication made with Oy and hence no discussion about FIBA forecasts.

3.1.5.1 EffectPlan development capabilities

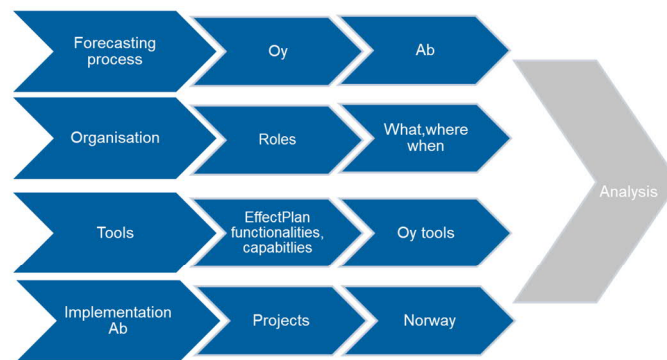
An interview with EffectPlan's sales consultant was held in spring 2019 to find out the current capabilities of the EffectPlan tool. According to him, the tool had a standard solution design, which meant no complicated technical customisation of the tool was needed. Configuration and setting up was easy according to the sales consultant. Configuration included creating and building the data templates. EffectPlan also allows a multi-company structure so different divisions can be added to the solution. Some companies used a harmonised accounting plan and hence the same solution is built for all locations/units in different countries but the process was the same. The solution can also be customised in the multi-company structure according to requirements.

When it comes to learning, training and understanding the functionalities of the tool, EffectPlan has an online training platform that can be accessed. Additionally consultancy services are also available if needed.

3.2 Key findings of current state analysis

The aim of the investigation was to have an overall view of forecasting process and use of forecasting tools in the case company. This included looking into what the present situation in the case company is in terms of forecasting process and S&OP, and what is needed in order to reach the overall objectives in this thesis. Moreover, the purpose was to recognise what are the problem areas; the weaknesses (if any) and to identify the strengths in the present situation.

Figure 7. Current state analysis graph



After studying the different processes in Ab and Oy, the findings indicated that the S&OP process is not so different and the forecasting process is similar. That said, one of the biggest strengths found in the current state analysis is the similarities in the processes. This can create an advantage because the change that the development could bring is not as big as with a completely new process.

Another strength the findings show is that forecasting and S&OP is fairly new in the case company. The newness in the practices can create an opportunity in further development as people can be more acceptable to change. Having interviewed the stakeholders, especially in PIM, it appears there is also eagerness for development.

Anyhow, there are differences in data, forecasting attributes set up such as how tonnages are calculated and in what time period the calculation is used. This should be taken into consideration in the development of technical requirements.

The administrator of Ab explained that since the tool had only recently been implemented, it is still being developed so this was taken as meaning that the tool can be developed to add FIBA forecasts. Further, the tool is easy to use and according to the administrator in Ab, development of the tool does not require external labour but new templates can be created according to the needs and requirements. But because the tool has been developed for Ab purposes, the development to include FIBA seems to require changes in the IT data landscape and set-up.

Because there is a limited amount of resources, implementations are usually done as part of continuous improvement in the case company and only bigger projects are handled with nominated project organisation, etc. This system of continuous improvement can be advantageous when working in a small-scale project with set resources, but challenging when there are differences in the way of working between the departments and organisations, especially when work is cross functional over different countries. Therefore, more cross functional communication with all stakeholders may be useful when developing EffectPlan.

3.2.1 Tools and systems analysis

The main difference lies in the tools. When it comes to FIBA forecasts, the Excel toolset-up is very complex and requires the studying and reviewing of steps every month. There is also no way of validating the data. Sales enter their figures into another excel sheet which is stored in company intranet. Version handling is difficult as heavy excel files take time to update and save. The current model seems to be working quite well as it is run by the manager in Oy but there is a risk in having one person running the whole process. This is also very time consuming and also risky due to data quality, errors that may occur in the system and even technical problems that can occur while updating. After all, Excel power queries are used to consolidate the data into reports that are used in purchasing, planning of capacity in production, planning budgeting activities, demand forecasts and allocation. Also forecasts are reviewed by tonnages per month.

It can be said that the EffectPlan tool could bring about benefit in efficiency and accuracy for FIBA forecasts. After all, the administrator handles numerous types of data in Excel

power query from 3 different ERP systems, data warehouses and other sources. However, it became very clear in the interview with the administrator in Sweden, that two different ERP systems are a challenge. He thought that it is not a problem to import FIBA data into EffectPlan as long as it is harmonised, which currently is not the case.

From early on in the demonstration session, it was quite self-explanatory that the Excel tool is very complex. It takes time to run all the data and data load is often so huge that Excel is running out of power. As the work is manual, there are many steps that need to be remembered in generating forecasts. This is time consuming and the manual process can lead to errors. Furthermore, sole administration of the tool can be a problem if there are technical difficulties and processing data takes a long time. Besides, verification of data accuracy is not done. A more effective tool would diminish the risks in the process.

3.2.2 General feeling of development

Bearing the ERP implementation plan in mind, it can be concluded that one of the biggest obstacles in creating a development plan may be the planned ERP project. Many of the interviewees thought, it is worth waiting before any forecasting improvement actions to add FIBA to the tool are taken. However, from technical point of view, this will not prevent the effort from happening as the development can still be done by using the data warehouse for harmonising data and in this way all the data required can be made available. To add technical solution can be developed even without having same ERP system.

4 EffectPlan pilot study

As part of the research, an EffectPlan pilot study was conducted from the end of January 2019 to the beginning of April 2019. As the preliminary knowledge of the current state investigation of the data and tools turned out to be more positive than previously presumed, it was put forward by PIM management. The pilot study acted as an important empirical research in the thesis and the findings from the study were useful in developing the plan for EffectPlan. The pilot study also represented a deeper dive into the current working practices, where the emphasis was on the existing data requirements and current business practices in Ab company.

The purpose of the pilot study was to find out whether the current FIBA forecasts could be imported into the existing template model in Effectplan. The plan was that once the data was in the tool, it would then be transferred into a real production environment.

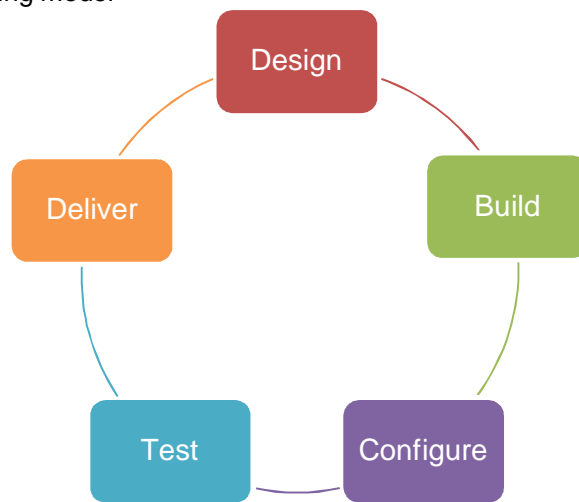
The scope included volume forecasts and followed the data preparation from inputting actuals to copying the FIBA sales forecast into EffectPlan. Testing was done by importing the forecasts into EffectPlan manually as no set-up for FIBA existed.

The pilot study was also supported by PIM management and follow up progress was reported to the country management. The schedule for reporting of the pilot study ran biweekly to PIM management, who then reported to country management. The project team included four personnel, the researcher, the administrator from Oy side and the main tool administrator; the finance controller from Ab side as well as his assistant (hereafter developer) from Ab side. The study was executed as a small project and the project goal was that the copy of FIBA sales forecast would be ready in the EffectPlan production environment by the beginning of April.

As previously mentioned, smaller projects are handled as continuous improvement projects in the company and hence the simple continuous process model was used in the pilot study to test the execution process. This model also benefited from proceeding quickly with the piloting. The process model was selected by the researcher and was based on a modified version of two separate process models; the original waterfall model used in the corporation and a lean, continuous improvement model shown as the continuous circle model. The researcher's former experience working in ERP implementation projects affected the model and hence the configuration phase was added

as a separate phase. She felt that this is essential to distinguish the configuration of the tool separately as many times configuration may be neglected and it may also be a separate phase in system projects. Further description of the tasks list in the phases is shown below.

Figure 8 project operating model



Source: Planview LeanKit (2019) and corporation IT project operating model (2019)

Figure 9 steps in the project phases

Design	scope volume forecast
	Schedule
	Team
Build	volume forecast data requirements
	data mapping
Configure	cleaning of data
	fixing of data
	test environment set up
	user access rights
Test	testing of import
	testing of tool functionalities
Deliver	copy of environment to production
	upload to production

The study was started in a kickoff meeting done via Skype in mid-December 2018. PIM management, the finance controller from Oy, the controller from Ab and the researcher were present at the meeting. It was decided there that a pilot study would be done to test if the tool can be used for FIBA forecasts hence the exercise would include testing the tool with FIBA forecast data. However, everything that was agreed was verbal and no other specific plans or documentations were made at the kick off meeting.

4.1 Progress and end result

The first step was to build and map the FIBA actual figures into the EffectPlan volume actuals template. Already at this stage, the group noticed there were several significant differences in product hierarchy and reporting of sales data. In Ab company, for instance, product sales groups are split differently than in Oy. The work required the administrator in Oy company to clean the FIBA data first and map it according to the template. This required quite a bit of effort and only once the data was clean enough was it ready to be imported into the tool.

This step took a quite a bit of time, because the data preparation turned out to be more time consuming than thought. The data had some discrepancies and thus there were a few rounds of data cleaning before the data was good to be imported into EffectPlan.

Next, the administrator and developer of Ab set up the testing environment for the FIBA. Again this took a bit longer than expected, 1-3 days, because the pilot study was not prioritised and work was delayed because of other work priorities the Ab personnel had. However, once the environment was set up, the team was able to test the tool functionalities. This was done mainly by looking through the test data and trying out the tool functionalities.

Next, the team tried to get the volume sales forecast data into the tool but unfortunately there were a lot of discrepancies in the data. On top of this, there was a misunderstanding of the goal of the pilot study. This was because there was misinterpretation and it was thought that sales in Oy would start using the tool. This led to one of the team members to focus on other priorities outside of the pilot study and a decision was made to put the study on hold. Further to that, with other priorities going on at the time of the study and a lack of follow up and support from management, the study remained on hold and, in the end, team members moved onto other duties without the sales forecast import exercise.

4.2 Pilot study findings

Even though the pilot study was not fully completed, it was a useful study. It helped to further define data requirements and gave an understanding of the existing functionalities of the tool and how it is used in Ab company. In addition, it gave an insight into what the tool would enable in terms of forecasts if FIBA forecasts were added as per the current setup.

The most important findings in the pilot study were that it helped to pinpoint the issues that must be overcome prior to developing the forecasting tool. The study helped to understand that in order to have a successful forecasting tool development, a proper plan should be created even for a small-scale project. This plan should include not only technical requirements but the business requirements and communication and change should be included.

Lack of communication and understanding seems to be a big barrier. It seems there is also a lack of understanding of the goal of adding FIBA forecasts as well as the benefits this could bring. PIM aims at working towards improving the processes and towards a common good according to strategic targets of the corporation and the case company but this does not seem so clear. This may be due to differences in the businesses in Oy and Ab but may also be due to working in different functional areas that may have led to working in some type of silos. It is also possible that the main reason is the planned ERP implementation which may cause change resistance as personnel may not see the real benefits in adding FIBA forecasts into EffectPlan before the ERP project is completed.

There are also gaps in the data requirements. First, FIBA sales forecasts cannot be copied directly to the tool templates with the same results as with existing Excel solution. Also, it should be considered how to handle the demand forecast since there are data gaps:

- Sales area categorisation
- Calculating volume stock days tonnes/day used → process in Oy tonnes/month
- Plant level data

First, there is no existing demand forecast template as the set-up is different for Scandinavia forecasts and actually this data is in the Qlikview tool. Second, the resources time is important and there must be a better way of planning of them. Management support is essential in order to successfully make the FIBA improvement plan. Besides, the major misunderstanding was with the scope of the study and to succeed, the scope must be clear and documented in the project planning phase. Data quality is important but may take some time to be cleaned as was the case during the pilot, up to 1 or 2 weeks might be needed for this. Finally, there seems to be overall resistance to change due to the general feeling about the importance of implementation. This may be because of the current workload with resources and the prioritisation of the plan. After all in the midst of the study, the case company was in the middle of closing a deal on a major acquisition. This finding is of importance on the communication side and the overall change when developing the plan.

The findings and lessons learned from the pilot study were:

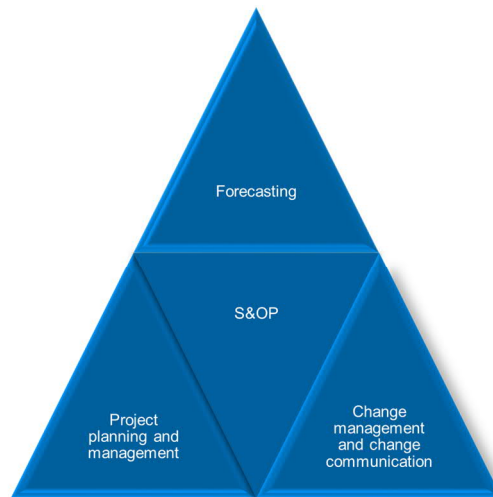
Table 2. Pilot study findings

Areas to improve	What?
Business requirements	Requirements definition and scope
	· what is needed
	· what do we want to achieve
	· on what level
Data requirements	Tool
	· volume forecast template
	-actuals
	-sales forecast
	-demand forecast?
	· What are the capabilities of the tool
	· Testing hands on experience
Organisation	Roles
	· who to involve
	· work load
	· Schedule

5 Existing knowledge / Best practice/ Literature

The theoretical framework is formed from academic writings that have been examined based on findings in qualitative research. Theoretical knowledge in the research comprises an introduction to forecasting and S&OP processes and the tools, project planning and management needed for the development plan as well as the organisation involvement and roles and responsibilities that have been found to be essential in the plan. Furthermore, the framework includes a review of change communication as well as a study and effect of change management. The literature chosen includes books, articles and website sources. It incorporates the topics as illustrated in the pyramid below:

Figure 10. Theoretical framework study areas



5.1 Forecasting

According to Krajewski, Malhotra and Ritzman (2019), forecasting is a prediction of future events that are used to plan business operations. These are estimates of uncertain future events including occurrence, magnitude and timing factors. Kumar and Suresh (2009) state that forecasts are essential in having smooth working operations. They can provide information of future activities that can help business in guiding the business operations towards organisational targets. Slack, Brandon-Jones and Johnston (2013) remind us that although forecasting is difficult in a business context and much more prone to error

than, for example, forecasting of natural events like the sunrise, it is a necessary business process that can help managers in decision-making in planning future resources (Slack, Brandon-Jones and Johnston 2013). Without a forecast, there is no way to anticipate future events or to prepare for them and so the forecast gives an idea of the expectations of the future events (Sanders 2015). Thus, as stated by Kumar and Suresh, continuous improvement should always be the goal in the forecasting process (Kumar and Suresh 2009).

Forecasting requires management commitment according to Gilliland, Sglavo and Tashman:

“Challenges in business forecasting, such as increasing accuracy and reducing bias, are best met through effective management of the forecasting process. Effective management, we believe, requires an understanding of the realities, limitations, and principles fundamental in the process” (Gilliland, Sglavo and Tashman 2015, p. 21).

5.1.1 Principles of forecasting

As mentioned already, forecasts are rarely completely accurate. This is because there are too many factors in the business environment that cannot be predicted with certainty. Forecasting involves the prediction of future events and therefore forecasters must live with a certain error margin in their forecasts. This margin is the difference between the figures predicted as opposed to what actually happened. The goal of the forecast is maintain overall good forecast accuracy. Even though few forecasts are perfect, generating forecasts with a good performance average and having smaller errors is a good goal (Sanders 2015).

Forecasts are more accurate at the product group level than individual items. This is because the individual values cancel each other out when product families and product groups are combined. The data become more stable even when the individual items in the group are less stable. The result is a higher level of forecast accuracy. Additionally, one way of doing this according to Krajewski, Malhotra and Ritzman (2019) is to look for more dimension in forecasts by combining forecasts by averaging independent forecasts based on different methods, different sources and different data. These combination forecasts often perform better over time than even the best single forecasting procedure (Krajewski, Malhotra and Ritzman 2019).

Forecasts are also more accurate when predicted in a shorter rather than longer term time frame (Sanders 2015). It is due to the lower degree of uncertainty with forecast numbers. Data are not changing much in the short term but as the time frame expands,

there is a greater likelihood that changes in established patterns and relationships will occur. Hence long range forecasts tend to be less accurate than short range forecasts. Sanders quotes “forecasting is an ongoing process that is always changing as new information and data become available” (Sanders 2015, p.25). Companies should fully understand the principles of forecasting in order to continuously look for improvements in the process and strive for the best possible results that can be obtained with forecasting (Sanders 2015).

Types of forecasts and demand-driven approach

Different functions in the company have different type of needs for forecasts. (Myerson 2015)

- Marketing forecasts determine new product launches, discontinuation of products and service, which markets to enter and exit, and which products to promote
- Sales use forecasts to plan sales activities and resources based on the estimates of future sales
- Supply chain managers use forecasts to plan procurement, productions and logistics operations
- Finance and accounting make forecasts for financial planning such as for budgeting and capital expenditures

The aim with most forecasts is to predict demand, yet the available data to prepare forecasts often reflects sales. If the inventory stock outs occur, sales are less than demand. (Kolassa and Siemsen 2014). In fact as stated by Sanders (2015) a forecast of demand is critical not only for a particular business organisation but for the entire supply chain. After all, it affects the plans made by each organisation in the chain. The risk occurs when members of the supply chain make their forecasts independent of each other and only look at the demand of their immediate buyer not the final customer in the chain (Sanders 2015).

This phenomenon also gives rise to the bullwhip effect. The bullwhip effect occurs when each function in the supply chain forecasts its own demand, plans its inventory levels and does the decision making independently of other organisations in the supply chain.

This causes volatility in orders which makes forecasting more difficult, and leads to excess inventory levels. It also can cause a high risk of stock outs and results in insufficient use of working capital and production capacity (Sanders 2015).

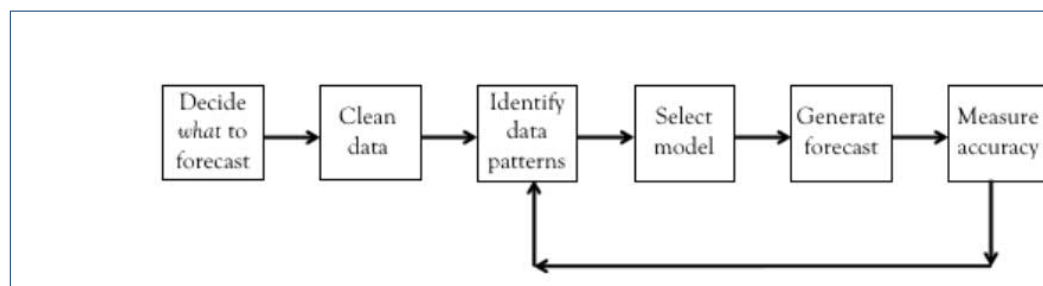
Hence operations in particular are primarily very interested in demand forecasts as the managers use the forecasts to estimate raw material prices, plan human resources and inventory levels and a host of other activities. This in turn can improve the use of capacity, responsiveness to service the customers and overall profitability (Kumar and Suresh 2009).

Up to now, the challenge to be more demand driven rather than forecast driven lies in the fact that many companies have little visibility of actual customer requirements, so they are forced to make forecasts based upon previous sales or deliveries and convert these forecasts into inventory planning. Still, the technology breakthroughs in the last decade of capturing demand direct from the point of sales or point of use are transforming the organisation's ability to access the market data and respond directly to it (Christopher 2016).

5.1.2 Forecasting process

Sanders (2015) states that it is important that the forecasting process is clearly defined with specified process steps. The process can be illustrated as follows according to him:

Figure 11. Forecasting process by Sanders



Source: Sanders (2015, p.20)

According to Myerson (2015), although forecasting is done slightly differently in companies and depending on the industry, the essential steps in the forecasting process are the same. He lists the 7 most important phases as:

1) Determining the use of forecast

Although this varies by industry, it is important to define what the forecast is for, manufacturing forecast may drive production and deployment while in retail the forecast might determine purchasing requirement and in service sector the forecast may be used in planning labour resources.

2) Defining the items to be forecasted

It is important to define what items are selected for the forecast, is the forecast aggregated and what level the forecast should be.

3) Defining time horizon for the forecast

How should the forecast be reviewed as? Is it a short term forecast, medium or long term forecast? What type of time frame is determined i.e. 30 days, 1-3 months or 4+ months (quarterly buckets).

4) Selecting forecast models and methods

What sort of forecast models are used and built? Such as customer forecast, is the supplier information included, are there mixed forecasts and so on.

5) Gathering needed data for the forecasts

This is important when using forecasting tools. Initial integration will require defining the data requirements, eliminating errors and such. Once this is set up, the long-term data requirements include data maintenance/updates and adding new items such as new and discontinued items.

6) Generating forecasts

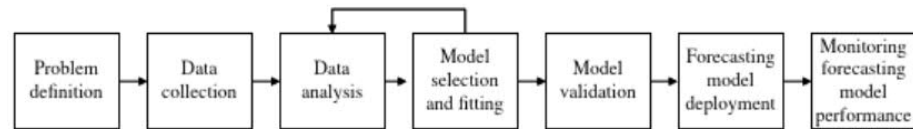
Statistical methods are usually used to generate baseline forecast at different detail levels. After this, the forecast numbers are audited and further analysed by trying out other statistical models. This can help to look at the forecasts from different points of view and help to gain an idea of sales estimates, promotional plans and supplier information.

7) Validating and implementing results

Forecasts are reviewed in S&OP meetings by the cross functional teams at the various detail level and unit of measure to ensure the highest level of forecast accuracy possible. This will result in agreement of the best possible forecast number which eventually means one forecast and a mutual understanding of forecast accuracy. The process usually cycles through on a monthly basis depending on the industry and the type of forecast and adjustments to the forecast are done due to over/under-sells, demand information, changes to promotions and discounts for instance.

Montgomery, Jennings and Kulahci (2015) describe the forecasting process as follows:

Figure 12. Forecasting process by Montgomery, Jennings and Kulahci



Source: Montgomery, Jennings and Kulahci (2015, p. 14)

The difference in this model is that it is more detailed. They list the phases as follows (Montgomery, Jennings and Kulahci 2015):

1. **Problem definition** relates to what is the purpose of the forecast and how it is used so that it meets the expectation of the customer (the forecast user). Defining forecast time horizon or lead time, what the forecast interval for revision is and what level of accuracy is required. The problem definition phase gives an opportunity for the business to discuss in detail the issues that lie in obtaining forecasting data or in the way of working, for instance, when developing inventory control forecasting there may be issues such as product shelf life, time required to manufacture or other lead time issues in obtaining the goods.
2. **Data collection** refers to the relevant historical data for the variables to be forecasted. In this stage, it is necessary to look at the relevant data and what the missing variables, potential outliers and other data related issues are that have occurred in the past. During this phase, planning of data collection and storage should be discussed and how to ensure the data is reliable in the future.
3. **Data analysis** is important step in the selection of forecasting model to be used. Preliminary data is prepared and checked against potential forecast models.
4. **Model selection** and fitting is defined as selecting one or more forecast models and fitting it into the data.
5. **Model validation** refers to forecasting model evaluation where the model performance is evaluated in the intended application and data. The forecasting errors should be examined in this phase also and in what scale the forecast errors would occur with the new data
6. **Forecasting model deployment** is a phase where the forecasting model and the forecast is deployed to the customer. It is important to ensure that the customer has

an understanding of the use of the model and that generating timely forecasts from the model becomes as routine as possible.

7. **Model maintenance** includes ensuring that data sources and other required information are available to the customer and forecast models and systems are functioning in the right way. Monitoring the model performance and especially forecasting errors in the system is essential and should be done as ongoing activity

Forecasting process development is absolutely essential and the process should be aligned to the operative performance metrics (Myerson 2015). He continues presenting a KPMG study made in 2007 which pinpoints the forecasting practices the best in class companies are using. The findings of the study were:

- Defined responsibility of the agreed forecast
- Forecast accuracy has been set at the target level and forecasts are used in ongoing performance management
- Continuous improvement practices are in place and scenario planning and external market reports and data is incorporated
- Updating and reviewing of forecasts is constant cycle and forecasting tools are more efficient forecasting software systems rather than spreadsheets

Forecasting tools

Although the framework model for the forecasting process has been defined by the industry experts, according to the KPMG study many companies have challenges in following them, especially when it comes to selecting forecasting technology (Myerson 2015). Many companies rely on using solely spreadsheets in generating forecasts, Myerson writes of the study results (2015). According to KPMG, this causes challenges in the process, as there is a risk of losing efficiency and even having redundancies in the work process (Myerson 2015). In fact, according to Sanders (2015), spreadsheets are not meant for statistical forecast analysis and capabilities provided are limited to exploratory data analysis, checking of model assumptions and making comparisons of competing forecasting methods. Many other tools allow input from Excel files and enable integration with other forecasting systems (Sanders, 2015).

Küsters, McCullough and Bell (2006, p.613) write that forecasting tools should not only target organisational requirements for accuracy but must also improve processing speed, robustness and user friendliness in the systems. Forecasting is often dependent on organisation, production and sales channels, and so the forecasting systems should be tailored to the needs of specific organisational needs and users. This requirement may result in the development of specific forecast and operations architectures that are designed to look at the peculiarities of organisation-specific information and decision-making requirements (Küsters, McCullough and Bell 2006, p.613). Chopra and Meindl (2010) state that a sound IT system should help to trace the historical forecast data and errors that have occurred in order to improve the forecast process in the future. However, even with the best forecasting tools the human interaction in decision-making and the evaluation of forecasts is vital (Chopra and Meindl 2010). Companies must not rely too much on automated systems and software to quickly generate forecasts but carefully follow the forecasting process and analyse and evaluate forecast numbers. It is critical to look at forecast errors when evaluating forecast performance and to measure forecast accuracy in the long term. When the forecast accuracy is evaluated over time on regular monthly basis for example, the business will get a good idea about how well they are doing. Another vital aspect to forecasting is that the parties involved in the forecasting process should be familiar with the data, software and calculation methods used in generating forecasts. Judgment and assumptions made should be documented and transparent to everyone and individuals should be held accountable for their judgment (Chopra and Meindl 2010).

Minor enhancements in the forecasting process can lead to huge improvements in the supply chain without major investments in the technology. That said, the purpose is to manage cross-functional open communication and to get away from the organisational silos approach and conflicting incentives the parties may have (Kolassa and Siemsen 2014).

In a nutshell, forecasting is an important continuous improvement process that still relies on human judgment despite the availability of many sophisticated forecasting methods. According to Gilliland, Sglavo and Tashman (2015), in order to run an effective forecasting process, the business must follow a schedule that includes forecast, managing of forecast and forecast follow up in ongoing meetings, such as sales and operations plan-

ning (S&OP) meetings. An effective process also includes publishing the demand forecast on time and making sure all the parties involved have easy access to it for their own planning activities (Gilliland, Sglavo and Tashman 2015).

Brief explanations of data, information ERP systems

When talking about data and information simultaneously, it is important to distinguish the two terms. Data are the facts from which the information enabling decision-making is derived. Data are rarely used alone as such and in order for data to become information they must be put into context. This is what information systems such as ERP systems are used for. They enable users to have an overall view and define the level of information that is needed to unravel issues or to make decisions. Information systems also enable users to trace the source of the information from the data or to specify the required data need based on the information in the system (Myerson 2015). This can sound quite complex but put simply it means that a sales order transaction can be viewed by its static data such as customer name ID or by the sales area code that belongs to the transaction. An information system such as ERP is used to collect, process and share information so that it is available to decision-makers at the right time, easily accessible and the data is accurate. In ERP systems, this means that the solutions attempt to integrate all functions such as sales and purchasing across the company into one single computer system solution so that it still can be specified to match different department's specific needs (Myerson 2015).

Data warehouses and business intelligence tools

Data warehouses are used to store data such as sales, transactions, company financials, business and supplier performance and customer activity and relationships. A data warehouse can be a single storage system or nowadays, when the volume of data grows rapidly, it has become an integrated system that comprises components that are physically or geographically distributed like cloud data storage space. The purpose of the data warehouse is to handle vast amounts of data from multiple sources and different organisational information systems so that it can be organised, processed and integrated. The basic function of a data warehouse is data extraction, transformation and loading. Data extraction refers to obtaining data from multiple internal or external sources. Once the data extraction has been done, the data are transferred in the system through multiple

rules to prevent duplicated records and problems with missing information for instance (Montgomery, Jennings and Kulahci 2015).

Data cleaning involves examining data to detect possible errors, missing data or unusual values and other discrepancies and then correcting those that are detected. Data cleaning can also immensely improve the forecasting process (Montgomery, Jennings and Kulahci 2015).

Business Intelligence tools are useful in sorting out the vast amounts of data that have become available through supply chain technologies (Myerson, 2015).

Business Intelligence tools enable users to create new report views and to combine data from different sources through a range of reporting models. The tools help in reviewing the static data by cultivating it into numerous different report views and analyses.

Forecasts are usually produced by statistical forecasts in combination with managerial judgment where the initial statistical figures are adjusted. Having the adjustment done based on the opinion of the manager without using available techniques can often lead to a one-sided view. Still even the best demand forecasting software has its limitations and relying blindly on technology is not a good solution either (Sanders 2015). The idea is ultimately to have an integrated collaborative process that aims at minimising variance with actual versus target (Myerson 2015).

Sanders states that when implementing technology it is important to remember to focus on the process as technology does not automatically make forecasts more accurate (Sanders 2015).

5.1.3 Importance of Sales and Operations Planning in forecasting

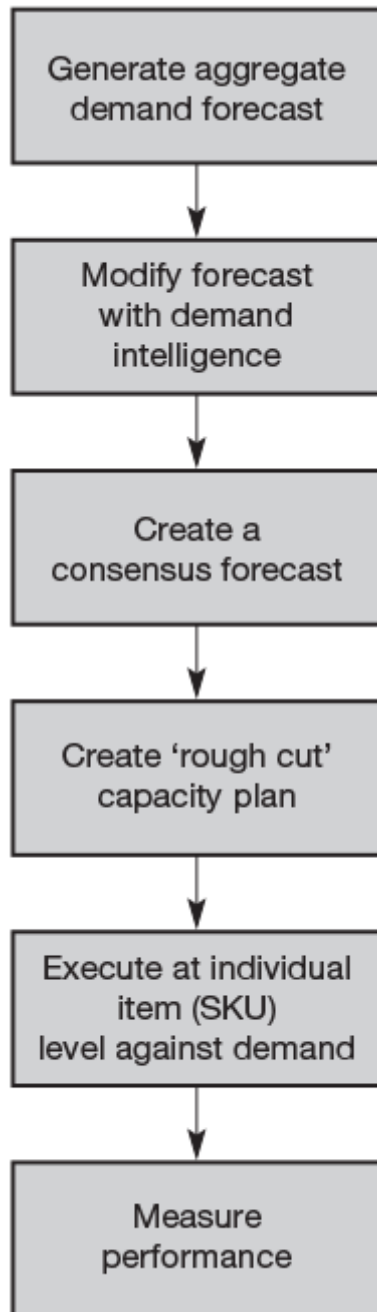
Sales and Operations Planning (S&OP) can be seen as a collaboration and communication channel to improve the customer service level in the long run. As an organisational process, the aim of S&OP is to increase collaboration between the supply and demand functions (Sanders 2015).

The process is based on information sharing between different business functions and using the information to generate forecasts (Sanders 2015). Teamwork is an essential

part of S&OP and requires sales, distribution and logistics, operations, finance and product development to work together in order to improve customer service, reduce inventory levels, lower customer delivery lead times and stabilise production levels (Sanders 2015).

The main purpose of S&OP is to bring marketing and sales closer together with operations and sourcing to ensure supply is better matched with demand requirements. The process includes a series of meetings aimed at reaching agreement between the functions on the course of actions required to achieve an optimal level of balance between supply and demand (Sanders 2015). Essentially marketing and sales meet at regular intervals with operations and supply chain personnel to present their modified sales forecast and then discuss the constraints that might cause challenges, such as capacity issues, supply shortages etc., in achieving the forecast. The S&OP meetings will also create a chance for the team to look ahead and understand the future impact of current trends to plan for promotions and new product introductions (Christopher 2016). After all, the purpose of the S&OP is to anticipate the real market requirement and to react to it accordingly in the most cost effective way.

Figure 13. Main steps in the S&OP Process



Source: Christopher (2016)

According to Christopher (2016), the S&OP Process should also involve key customers and accounts. This would be beneficial in strengthening collaboration. Secondly, he

states that because the goal of the S&OP process is to reduce dependency on the forecast, it is important to measure the lead time gap between individual item levels. He states that the aim is to reduce the gap progressively by a concerted effort on time reduction and improved visibility (Christopher 2016).

5.2 Project planning and management

Project planning and management is an essential part of every development. This also became clear in the earlier research and hence the next chapter introduces the important concepts of planning and managing projects.

Hobbs (2009) describes a project with the following quotation:

“A project is a piece of work that is designed to bring about an agreed upon beneficial change within a fixed timeframe using specified resources”

A project has a pre-defined goal which is the stage where the project is intended to be taken to. It can also be defined as a task with a desired end point (Newton 2016). The project goal is the agreement of the specified future stage that project implementation aims at (Artto, Kujala and Martinsuo 2006). A project can also be defined as a one-off scope of work that includes three essential parameters: time, cost and quality (Hobbs 2009). It is the way by which a particular result is delivered using specified resources within a set time frame (Hobbs 2009). Projects can be used to fulfil a predefined objective in a planned time period by planned cost (Newton 2016). Projects usually consist of a number of people to achieve the expected outcome. There is also often a certain risk associated with projects (Hobbs 2009). The duration of projects can be short, such as implementation of a standard software package to a defined group of personnel, or long, such as the deployment and consolidation of technology data centres. Short and long term are relative depending on the complexity and area of business, and can mean different things to different organisations. In any case, projects are characterised by having a clearly defined beginning and ending point (Resch 2011). Project management on the other hand can be defined as a management skill of transforming ideas into tangible results (Resch 2011). Hence for successful project every project plan from A to B is managed and controlled.

According to Hobbs (2009) a project has six stages:

- 1. Initial stage**

- 2. Definition stage**

Identifying the problem or opportunity to be executed

- 3. Planning stage**

Determining what needs to be achieved, when and with what resources

4. Control stage

Detailed description of how to achieve the objective of the project. Time schedule, resources, responsibilities and communication activities

5. Implementation stage

Execution of the project, monitoring progress and adjusting the plan according to the need

6. Review

Assessment of project outcome and identifying and listing lessons learned

Slack, Brandon-Jones and Johnston (2013) presents a slightly different approach and according to them there are 5 project phases of which the most important phases are: project planning and control, understanding the project environment; defining and planning the project; technical execution and project control. This thesis reviews the four most relevant phases in detail:

Phase 1– Project surroundings

The project environment in which the project takes place influences how the project is carried out often through the stakeholder activity and can also include internal or external factors. The environment in which the project is executed is also the main determinant of the uncertainty surrounding it.

Phase 2 Definition of the project

The end state that the project is aiming to achieve is the objective of the project. Scope is defined as the exact range of the responsibilities included in the project management, and project strategy is the way project management is going to meet the objectives of the project.

Phase 3 – Project planning

Planning project phase determines the cost and duration of the project, which in turn can be used in deciding whether or not the project will go ahead/kick off. During the planning phase, the resource needs are discussed. The planning phase is also important to determine the allocation of work and to monitor progress. Planning of the project should include the identification of resources and their roles and responsibilities, and it should help in assessing the impact of the changes that may occur in the project. Planning of the project is not a one-time phase but planning activities may be repeated several times during the project as changes

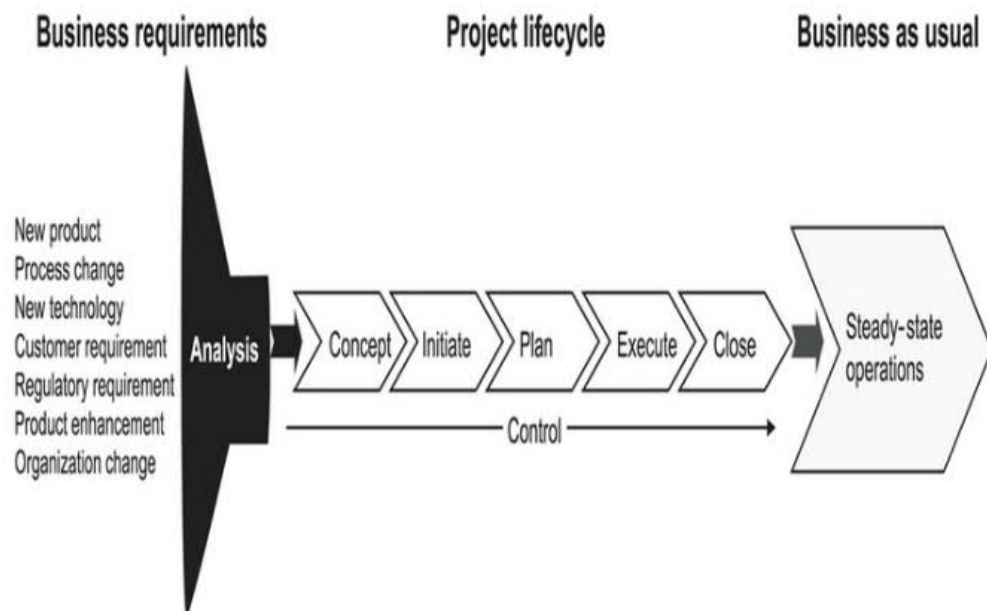
occur. Re-planning is part of the project process and not a sign of failure or mismanagement. Especially in uncertain projects, re-planning is a normal occurrence (Slack, Brandon-Jones and Jonston 2013).

Phase 4- Project monitoring

Project monitoring phase includes three different factors: How to monitor the project for the project progress; How to assess the project performance by comparison of the monitored observations with the project plan; How to make changes in the project so that after the project is back on track according to the plan. Usually a variety of measures are monitored (Slack, Brandon-Jones and Johnston 2013).

According to Resch (2011) the different project phases together form the project lifecycle. Where, as stated by the other authors, the emphasis should be on the project analysis and planning of the project phases:

Figure 14. Project planning phases:



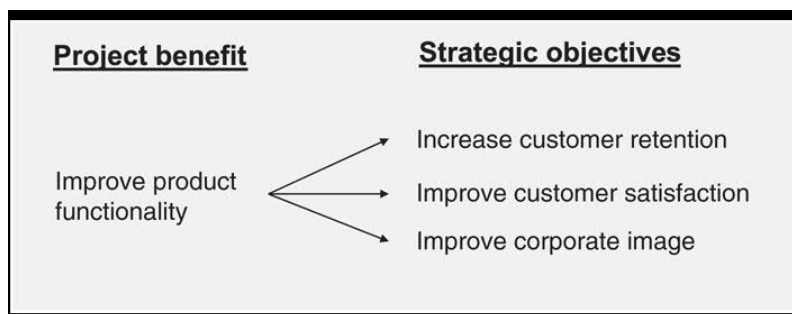
Source: Resch (2011)

Resch states that it is important to reserve enough time for the planning and analysis phase (2011). Without adequate planning and analysis time, project teams are not able

to build proper business cases and won't be able to justify the need for the project especially if the project is not considered a financial investment. In which case, the project is likely to fail and the business benefits won't be realised. He continues that project failure rates are high and that most of the failures are due to inadequacy in project planning.

Another essential matter in projects is that if the project is not tied to the strategic business goals, it will not provide much value to the business. It can generate a tremendous outcome but if the outcome is not tied to strategy, the value the project can add is small. Therefore a project must be aligned with the vision and strategic objectives of the company and clearly communicated to business leaders. This is essential information for executives and senior management because it gives them the assurance that the strategic objectives are being implemented in the organisation and that employees understand them.

Figure 15. Diagram of strategic objectives tied to project benefit



Source: Resch (2011)

According to Project Management Institute (2016), a project must be tied to overall corporate strategy and should not therefore bypass a proposal stage without being aligned with the corporate strategy target. According to them, the corporate strategy defines the scope and timing of the project. They stress that a feasibility analysis of the planned project should be done beforehand to identify existing processes as well as the gaps between the existing solution and future plan and to address issues that might hinder the progress (Project Management Institute 2016).

A project plan is a roadmap for the project that helps in guiding the work from the beginning of the project to the closing stage. It describes the detailed work plan and also

serves as a communication tool with stakeholders and the project team, Campbell states (2014).

Campbell (2014) describes the project lifecycle and each phase important in the cycle. He lists the most important activities in each phase. In addition to the initial planning of business case and ensuring the project is tied to strategic objectives, the initial state includes budgeting, defining the scope of the project and the schedule in which time the project is to be completed.

Figure 16. Project life cycle and project phases



Source: Campbell (2014)

Important factors regarding project planning phase according to Campbell (2014):

- Finalising scope definition
- Project objectives
- Project requirements and specifications
- Developing detailed work breakdown structure (WBS) a detailed work task list plan
- Identifying work activities and milestones
- Develop organisation breakdown structure
- Match project work activities and performing personnel
- Work out project scheduling and cost estimating
- Identify activity dependencies

- Sequence activities
- Develop project schedule
- Estimate costs
- Develop budget/funding profile
- Determine scheduled start dates
- Set project milestones
- Establish measurement baselines for schedule and cost performance (project metrics)
- Originate subsidiary management plans
- Risk plan
- Issues resolution plan
- Organisation and human resources plan
- Procurement plan
- Quality assurance plan
- Project change control plan
- Organisation transition plan
- Project communication plan
- Change management plan
- Deliver project plan documentation to decision authority

(Campbell 2014)

Furthermore, measuring project success is an essential part of planning. It is important to specify the measurements used to identify the project performance. How well has the project succeeded and what were the causes for failure or success (Artto, Kujala and Martinsuo 2006).

Project organisation and roles

Campbell (2014) defines and explains the key roles in projects

A project sponsor can be a functional partnership manager who provides authority to the project to proceed and provides financial resources. The project sponsor is the key player in the project. The person shares responsibility for the success of the project and helps the project team to be successful. With an internal project, the project sponsor is usually a senior manager within the organisation. The project sponsor provides guidance and

monitors the project, and plays a significant role in the initial scope development and project charter. Typically, the sponsor will approve the project charter. A good sponsor also can provide assistance in overcoming organisational and political obstacles.

The core team includes the personnel heavily involved in implementation of the project and their task is to perform the work defined for the project, but not necessarily to be involved in managing the project (Campbell 2014).

The project manager has a pivotal role in the project. S/he has the overall responsibility for daily project management tasks. The project manager aims at ensuring that the project is delivered on schedule, within budget and to expected quality. The project manager is responsible for the overall project plan, monitors the project progress and makes adjustments according to the plan while the project is ongoing. The project manager is also responsible for reporting the milestones and results achieved in the project to stakeholders and the rest of the project organisation. When changes occur in the project, the project manager is responsible for assessing their impact and reports them to the board. The board then decides whether or not changes should be implemented or not (Hughes et al 2012).

A project stakeholder is defined as an individual or organisation who has an effect or is affected by or even perceived to be affected by a decision or project outcome (Campbell 2014).

5.3 Change management and change communication

I cannot say whether things will get better if we change; what I can say is they must change if they are to get better.—Georg Christoph Lichtenberg

(Stumpf 2015, p.1)

This chapter discusses change management and especially change communication. From study findings, it can be concluded that change management and communication appear to be important and therefore this thesis continues by reviewing the topics from the academic perspective.

Change management can be defined as “a set of activities, processes, and tools designed to help people successfully adopt change.” (Carr 2014)

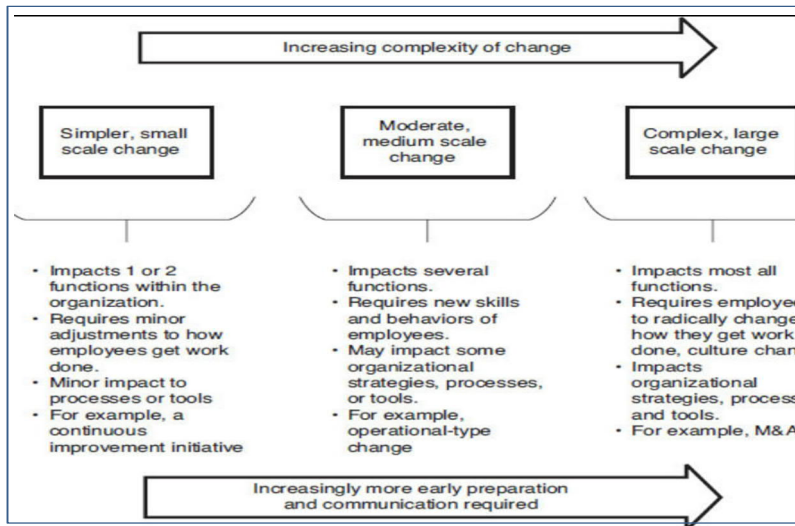
According to Abudi (2017), every business change must be managed as a project. This is because all change in the organisation happens through projects. In spite of that, every change project is a challenge because it is much easier to manage tasks than it is to manage people. According to Abudi, change is about managing people (2017). She goes on to state that people are unpredictable and while there are best practices that can be adopted for better people management during change, there are no shortcuts for doing so. Change management plans that were developed for one project may not apply to the next change project.

Projects require possible changes that will impact the people. For instance a project that aims at expanding product offerings might require developing a new product to offer to the customer and may require the implementation of new technology to support the product. Hence, employee training to support the technology to sell the product, provide support for the product or manufacture is required. (Abudi 2017)

Change initiatives require significant engagement through multiple communication channels already prior to the start of the project, during and after the project has been closed. Business process improvement initiatives have a meaning for employees and require a more personal touch. This is also valid for any other complex strategic change that can be business process focused change, change concerning people, change concerning customers or any other type of change with the organisation (Abudi 2017). Therefore,

change initiative and the efforts needed should be defined early on and the complexity of the project should be analysed based on the impact on the people and the time that should be used to follow up discussions:

Figure 17. Business change in terms of complexity and scale



Source: Abudi (2017, p.6)

Table 3. Time scale for change communication activities

Type (complexity) of change	Continue conversations for
Continuous improvement (small scale)	Min. of 2-3 weeks after implementation
Operational or incremental (moderate)	Min. 2-3 months after implementation
Transformational (complex)	Min. of 6-9 months after implementation

Source: Adapted from Abudi (2017)

Abudi claims that project teams often consider the end result of the project and targets for the projects while the change teams focus on the people involved. She continues that rather than looking at the end goal and what needs to be accomplished, the change teams consider how the people have to change for the goal to be achieved.

An organisation that can manage change well does not separate change from other projects within the organisation. It not only understands that all change happens through projects but that every project brings a change in the organisation, Abudi concludes (2017).

5.3.1 Identifying barriers in change

According to Kotter (2012), organisational structure and functional silos can cause a challenge when an organisation is going through a business change. He explains that change must cover everybody. As an example, a change that was first implemented from top management did not succeed because it turned out that the teams trying to work towards the change were undermined by the structural silos in many ways.

Fullan (2007) states that most organisations invest heavily in technology and possibly in training, but hardly at all in the sharing and creation of knowledge. He formulates that identifying the practices usually goes quite well, but transferring and using the knowledge is challenging and many times the organisation flounders (Fullan 2007).

According to Kotter (2012), in order to increase knowledge sharing, a communication plan should be established. This plan should include creating a vision of why, what and when in the plan. Communication practices should include two-way communication from top to bottom and bottom to up, thereby leaving room for discussion and dialogue (Kotter 2012). He explains that the essential part of communication is its simplicity. He pinpoints that there should be no jargon, that metaphors are beneficial for more descriptive explanations and that the key is the repetition of the messages. It is about two-way communication and creating dialogue, Kotter claims (Kotter 2012).

Carr (2014) explains that instead of just sending a one-way information message to people, it is recommendable to use multiple communication channels and encourage the audience to respond to these messages. She also points out that for communication to be successful, the key element is to start with a "blank page", omitting assumptions and explaining every matter in detail. Repetition of the messages is vital. Carr goes on to state: "When you think you have communicated enough, communicate more," (Carr 2014). She describes communication as a continuous cycle process where it is important to follow up on the communication plan and gather feedback (Carr 2014).

Abudi claims that to be successful, a major share of the timeline in the project must be spent on engaging and bringing along people and not solely on planning the tasks to be done. And to achieve a common understanding of goals and direction, the following should be in place (Abudi 2017):

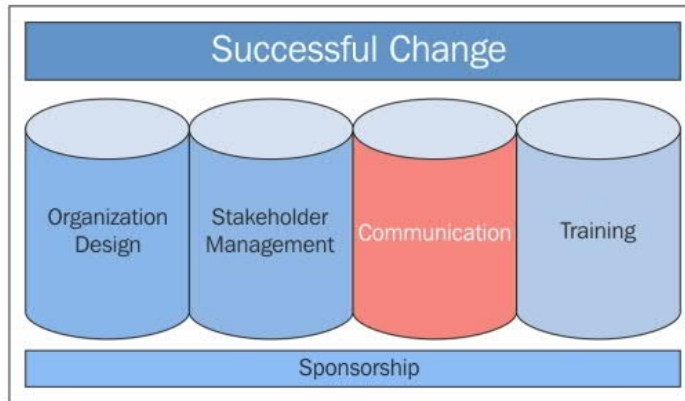
- A strategy around managing change that builds on project management strategy
 - A project manager to manage the project (this includes the tasks, budget, resources, time and scope of the project)
 - A change manager to manage the people-side of change (this includes engaging and encouraging people to support and adopt the change)
 - A sponsor for the project (project sponsor)
 - A sponsor for the change components (change sponsor or leader)
- (Abudi 2017)

5.3.2 Key factors in business change

Carr explains the key factors in her book *Practical Change Management for IT Projects (2014)* She calls them Pillars of Change. This research lists five of them:

- Sponsorship:
 - Top management sponsorship
 - Change personnel (pioneers of change)
- Design of the organisation:
 - Efficient structure of the organisation
- Stakeholder engagement:
 - Employee involvement
- Communication:
 - Honest, open and in time communication
- Training: Efficient training programmes

Figure 18. Change pillars



Source: Carr (2014)

Carr (2014) starts by explaining that when there is a change, organisation change must be considered. She pinpoints that it is important to consider how the personnel's tasks and roles could be affected in the change during and after the business change. Organisation design may sometimes lead to major changes and sometimes the human resources department should be involved in redesigning roles and responsibilities.

Secondly, she goes on to explain that it is important to build ownership and adapt change throughout the organisation. Hence it is important to get management involved and select a good sponsor who will provide support and involvement in the business change (Carr 2014).

Stakeholder management includes having an understanding of who the change will impact and the specific aspects, positive or negative ways. This understanding, Carr (2014) explains, is the basis in designing and creating communication and training activities. She states that to increase adoption of change across the stakeholders, it is recommendable to customise the change plan accordingly. She points out that individuals are different and adoption of change can happen in different ways for different people. "Not everyone will adopt the change at the same rate," Carr concludes (Carr 2014).

Communication is essential in any change project, Carr (2014) emphasises. It can be defined as the process of sending the right messages to the right audience at the right time using the right media. It requires receiving and understanding messages from stakeholders and using them to influence the business change (Carr 2014).

Training is the process of enabling stakeholders to act on the change successfully. It is crucial in change, whether this involves following a new process correctly, using a software system or behaving in a new way. She advises that the training plan should include different types of methods such as online training and self-learning. It is also important to have plenty of time to develop and implement training as 40 hours of material might not happen in the same week and implementation may take longer. People learn and learn again, and hence developing sustainable training where people can access the training material even after the project has been completed is recommendable, Carr concludes (2014).

5.4 Summary of theoretical framework

To summarise the research findings and to form the theoretical framework for the proposal.

- 1) The forecasting process is a continuous process and so development of the forecasting tool is a welcomed activity and can be useful also in the long run. It should be remembered that although forecasts are looked from different angles in the company, customer demand forecast is the only right forecast. Forecast accuracy can be considered when thinking about data accuracy. There should be different types of forecasts and more analysis of forecast figures is needed. But it should also be kept in mind that even minor enhancements in the forecasting process can make a difference in improving the whole supply chain.
- 2) The most important part even when developing a forecasting tool is communication and collaboration, and especially cross functional communication activities. When it comes to forecasting tools, more efficient tools are beneficial but a forecast always also needs a human touch for in analysis.
- 3) When it comes to project management and planning, project initiation and planning are key to managing a project. Project planning is all about collaboration and communication, and the tasks and project goal must be clear and understandable to all parties. Also to secure successful implementation, support for the project is essential. Management support and the project owner have an important role in establishing a base for support. Development activities in the project should always be aligned with strategic targets and it is useful to include this message in the development of a forecasting tool. Enough time should be spent to set up the project organisation and to agree on the roles and responsibilities. Documentation should not be forgotten and all agreed plans should be written down.
- 4) Change management occurs in all projects that involve people and so development of a forecasting tool should include change management activities. Moreover, there is no such thing as too much communication and sharing knowledge and information is essential. Training activities are part of change management activities. Multiple channels should be used to communicate.

6 Building the proposal

6.1 Co-creating the proposal

The findings in the current state and pilot study as well as the theoretical framework form the ground stone in building the development plan proposal. Gathering more data to gain new insights and have different aspects to the findings already made add another layer to the research.

The development work for the proposal was done by collecting data from industry experts. Altogether four external interviews were conducted and two follow-up interviews were made with the administrators in Oy and Ab company. The interviews were conducted in April and May 2019.

6.1.1 Development discussions held with administrators of Oy and Ab

An important step in the development of the proposal was to gather more data and verify the findings made in the pilot study and hence the interview discussions focused on these findings and a possible solution.

The administrator in Oy pointed out that the current set up of the volume actuals data template does not support FIBA forecasts because of the definition of sales area is different and would omit important sales business areas from the current template model. He commented that if the templates can be fixed or built separately for FIBA and the demand forecast is included, there is no problem. He seemed positive about development effort. He also stated that the scope of the development plan was unclear. He thought that further discussions were needed with PIM. He pointed out that the development plan would need a project owner and that change management is important. Additionally he noted that support from top management is vital.

When discussing the findings with the administrator in Ab, he stressed the importance of the requirements and needs from PIM and what warehouses would be included and what time intervals, etc. After that he considered there to be no problems with going ahead but that perhaps it would be easier to combine data rather than add FIBA fore-

casts to the tool. When asked about development, he quoted “there is no use in developing the tool to include FIBA forecasts until the same ERP system is in place”. It seemed he was firmly convinced of this.

6.1.2 Insights from industry experts

External industry expert interviews were valuable in the research as they brought a new perspective that was not tied to internal habits and customs. These interviews also supported the triangulation method used in collecting data. Altogether four interviews were conducted and these provided valuable feedback in building the proposal. The interviewees' background was in software development and business process development and represented experts with 10 or more years of experience in the field of business. The experts are named as expert A, B, C and D in this thesis.

The interviewees were informed about the background of the research and the main focus was on the following two questions asked:

- 1) What are the major success factors when developing software project execution plans?
- 2) What are the major pitfalls that can easily be overlooked?

Expert A

In the first interview, expert A, an experienced professional and consultant, thought that the type of development involves business change and therefore the roles and responsibilities of the people involved and how will the change affects them should be taken into consideration. This supports the statement Abudi (2017) has made about every change initiative affecting people.

Expert B

Industry expert B was a professional working in an agile development organisation. He pointed out the importance of organisation. He thought that management support is vital and that it is important that enough time is spent on defining business and data requirements so that these are as well defined as possible, then the execution of the plan is done quickly. This supports the project models (Campbell 2014; Resch 2011 and Slack,

Brandon-Jones and Johnston 2013). Expert B also thought that 3-4 weeks working periods called sprints could be beneficial.

Expert C

Expert C worked in a similar manufacturing industry and was an experienced business development director having run different types of projects in her company. She talked about the importance of having a good communication plan. This is also in alignment with what Kotter explains (2012). She thought that communication should always be positive. She also explained that it is important to remember that the message that is being sent may not be understood in the same way as it was supposed to be. For example: "We don't talk about tool implementations but improving processes each time we have an implementation project". This is because with tool change, the process changes also in every implementation. "Because if you only talk about tool implementation, people can interpret the message in the wrong way", expert C concluded. This statement also supports the fact found from an academic source; according to Sanders (2015) when implementing technology it is important to remember to focus on the process since technology does not automatically provide the solution per se.

Expert D

Expert D had a very vast outlook on software development having worked in the telecommunications industry. His interview was slightly different as he was asked about his view of development activities when dealing with different types of data and systems. He thought that development should be smooth and agile. This would, according to him, mean small steps would be taken and in between there would be some sort of check points that could be used in communicating the progress. He also thought that acquiring feedback from stakeholders is important once the project has been implemented.

He was also asked how he would react in a situation where development might be slowed down by a major investment in another project. He thought that in the situation as such, timing of the development is important. But since there is no way of predicting anything, a cost of delay analysis would be useful. This analysis calculates the benefit and cost for a project against other investments. He explained that it would be useful to calculate this for a project in two types of scenarios; the result if done before a major investment and the result if done only after a major investment. This would then give an idea of what

could be more cost effective in the long term. He thought that it is a major matter that should be analysed carefully and mentioned that the calculation can be found in many sources. “But at the end of the day things are changing fast, so most important is to try to be as agile as possible”, he concluded.

Measuring the success of the project is essential stated Expert D. He suggested that this can be done, for example by, having an indicator to check the performance of the forecasts after the implementation. This statement supports not only the project planning key factors found from Campbell (2014) and (Artto, Kujala and Martinsuo 2006) but also the forecasting process measurements discussed by Montgomery, Jennings and Kulahci (2015).

6.1.3 Overall analysis of the findings after collecting data 2

The findings show the ERP implementation plan to be the biggest obstacle that seems to cause resistance to change. It may be useful to look into a cost of delay analysis but since it is not presented further in this research, it is not part of the solution.

The findings suggest that there is lack of communication and understanding. Overall discrepancies in communication are causing misunderstandings of terms and the needs required. There is also confusion in understanding the business goal and what PIM's aim is. As stated by Expert C, the message to the recipient may actually be interpreted differently and thus be misunderstood. Finally, the findings indicate that working in functional teams may have led to people working in silos. This easily leads to not understanding the overall project benefit and the purpose which is to work towards a common goal for the whole company.

It seemed that there was confusion as to what the development goals were. Hence the next step that could benefit and save time later is to go back to defining and planning what the needs and requirements are for development of the forecasting tool. What the end goal is and how to achieve this. The ultimate purpose is to reach a common understanding and agreement of the development plan as well as to establish an understanding of the overall strategic benefits this development plan can bring.

Findings in the research are summarised in the below table.

Table 4. Overall research findings

Findings	CSA and Pilot study	Conceptual framework	Findings questions	Data 2
Business needs and requirements	Unclear requirements definition and scope	Clearly defined requirements definition and scope	what is needed	Administrator of Ab thought that it must be defined what are PIM requirements.
			what do we want to achieve on what level	what storage level
				Administrator of Oy and Expert A thought that the improvement effort should have strong support from management. Expert A reminded that enough time should be spent on defining the requirements
				Expert A and B thought that project champion and project sponsor is needed
Technical requirements and process related	Data template does not support FIBA requirements	Forecast systems data analysis and model validation, data warehouse data set	How?	Administrator Oy suggested that new data template would be built entirely for FIBA forecasts. Common datawarehouse to be used to extract actuals
Roles in the project	Unclear roles and responsibilities	Clearly defined roles and responsibilities	Team roles and tasks should be defined prior to project execution	workload, schedule, task lists
			Role of the project owner	workload, schedule, task lists
			Role of the sponsor	workload, schedule, task lists
Lack of Change management	Resistance to change	Managing change	How?	Creating a change plan and vision of the change, communication. Expert B reminded that change impact everyone involved. Roles and responsibilities to be defined
Lack of support from management	Lack of support	Support from management		Clearly defined role of steering, communication
Project Communication and Collaboration	Lack of communication	Communication	Communication plan what and to whom?	Expert C thought clearly defined communication plan is the key
Project Communication and Collaboration	Lack of understanding	Clearly understandable message	Clearly explained goal and clearly defining what is to be achieved	Clearly explained messages, terminology communicated, documentation
Training	Lack of training	Adequate amount of training	What?	Process related training end-to end scenarios, hands on testing
Measuring	Lack of measuring tool performance	Tool Performance metrics	What	Expert D thought that forecast accuracy and data reliability can be used as KPI to measure tool improvement success

6.2. Thesis proposal

The thesis proposal is built on three separate elements. The first element presents a framework for project initiation and planning. The second element focuses on change management and change communication, and the third element consists of specification of the technical solution that is to be discussed also during the project initiation and planning phase.

Figure 19. Development plan proposal



6.2.1 Project initiation and planning

Project initiation (kick off)

The first element in the proposal is project initiation and planning. This element is mainly based on the models by Campbell (2014) and Carr (2014). It suggests that a small-scale project, where change communication activities are combined, is created for the development of the forecasting tool. Based on the project model by Campbell (2014) the phases in the project are:

Figure 20. Recommended project phases and progress points



Source: Adapted from Campbell (2014)

As the findings suggest, project initiation and planning is the most vital part of the plan. It sets the direction for the project. Project initiation is arranged as a kick-off meeting and includes follow-up on matters until they are finalised in the plan. The purpose of the meeting is to tackle the lack of communication and any misunderstandings in the current situation and to have everyone involved in discussions. This will help to create a common understanding of the development plan and identify important matters. Everything that is agreed is documented so as to minimise potential misinterpretations and misunderstanding.

Project kick-off meeting and initiation includes:

- defining of project goal and purpose.
- project scope adding FIBA
- solution:
- volume forecast FIBA model

The workshop also includes a discussion of the end-to-end scenario of what is required and the time schedule

- What the deadline is and what the milestones are
- Budget
- Estimated cost of tool development and process change

- EffectPlan user licenses
- new environment set up cost
- labour hours
- external labour if used
- training on tool usage

As suggested by the administrator of Oy, the proposal suggests that in the kick-off meeting the plan is walked through in the process flow model. This visualisation can then help in creating an end-to-end scenario analysis and form the big picture.

The end goal of the project initiation kick-off meeting is to create a common understanding of the goal and scope of the project, and get approval for the initial plan, which can then be taken a step further and developed in the planning phase. Kick-off participants include the development manager, head of PIM, administrators from both Ab and Oy, project sponsor(s).

6.2.2 Project planning phase: Organisation

After initiation has been completed and mutual agreement has been reached, planning continues with organising resources for the project. The project organisation forms the key resources in the project. In order to have people engaged and committed to the project, the organisation consists of the following key nominees:

Figure 21. Initial project organisation proposal



Project Owner, Steering and Project Sponsors:

Management support is important to ensure smoother project implementation. In a small-scale project, involvement from management does not require heavy input. The idea is to have the support agreed and follow-up is done in status meetings.

The roles are:

- Project Sponsor from Oy and Ab management
- Steering group (parties from PIM, Project Sponsors Ab, Oy)
- Project owner, Head of PIM

The steering group is involved from the start to finish of the project execution and follows up the status regularly and oversees that overall the project targets are met accordingly.

Project team, key users, reference group and project champion:

All roles and responsibilities are defined and agreed prior starting execution. The project team roles, task lists, estimations of the duration of the work/resource time needed and time period is agreed in the planning phase. The same applies to the key users, who are senior buyers and buyers. Their input in the project, especially in testing, is important. Hence agreement is reached on the list of tasks and the work estimates needed for testing, etc.

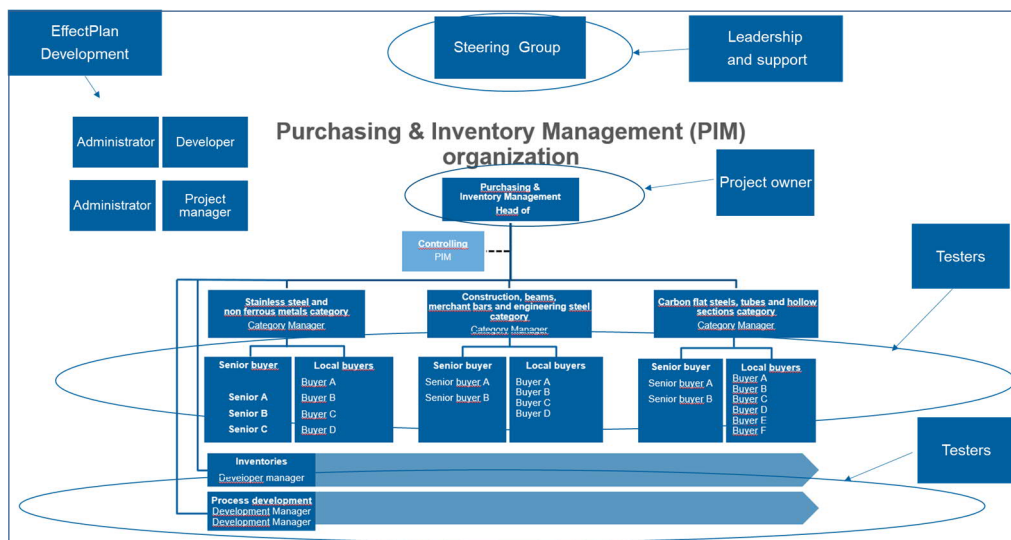
Testing is included to ensure the tool works in the proper way. Testing covers end-to-end scenarios by plant and by FIBA forecasts and by product line. Testers include a person(s) from the reference group; salespeople, finance in Ab and Oy and production. This will ensure the environment is tested properly. Other stakeholders are personnel from corporation BI and other corporation stakeholders that may be required for the technical solution built for instance.

The project champion can be a key user and the purpose of the role is to promote a positive message during project execution and to create awareness of the project.

The planning phase includes discussions and follow-up meetings for unclear matters. The final plan is finalised only when all matters have been agreed. The proposal suggests a checklist of the matters to be discussed and finalised:

- Project goal
- Process
- Organisation and roles
- Schedule
- Project key milestones or gate check points
- Follow up
- Setting up task lists
- Work estimates, buffer time between tasks
- What are the tasks that need to be done before other ones can be started
- Possible challenges
- Project key milestones or gate checkpoints

Figure 22. Project organisation proposal and roles



6.2.3 Project operating model

The project operating model in the execution phase refers to the model used in the pilot study. Development can be done more efficiently and faster using the circle model and also the experts recommend that four phases are needed for the project execution to run efficiently. Each step is clearly defined and systematically follows the development. After the initial first round of development, feedback is gathered.

Figure 23. Project operating model

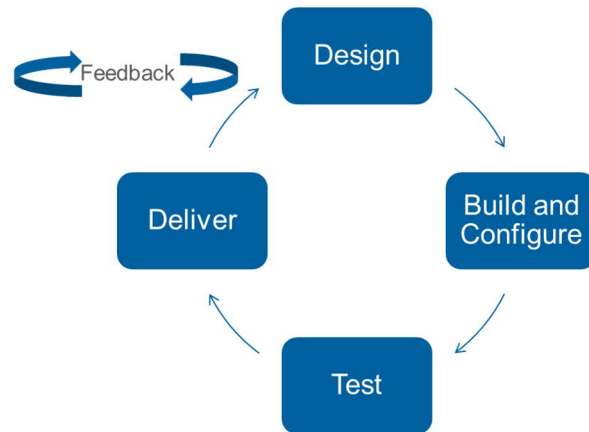


Figure 24 Task list associated with phases

- ▶ Depending on the project initiation these steps are defined in detail

Design

- ▶ Actuals and Forecast template Data requirements and business requirements
- ▶ Roles and responsibilities

Build and Configure

- ▶ Template development
- ▶ Data mapping and data cleaning
- ▶ Environment build test and production
- ▶ Fixing of data
- ▶ User roles

Training and testing

- ▶ User access rights
- ▶ Training
- ▶ Data testing
- ▶ Experimenting different scenarios

Deliver

- ▶ Production upload
- ▶ User roles in use

Project measures

In order to measure how well the new development has succeeded, the forecast accuracy is used as suggested by Expert D. Project measurement or the key performance indicator (KPI) in the project is done by defining the forecasting data accuracy and checking validity.

6.3 Communication and change management

The thing to remember when creating a communication plan is that the message may not be familiar to all stakeholders and may not be interpreted the same way as the sender may think. This also became clear in the findings and caused a misunderstanding in the pilot study. As Kotter states, communication simplicity is the key, no jargon and metaphors are to be used; repeat, repeat and repeat the message (2012).

Communication should also be tied to the strategic goal of the corporation and case company. This message should be loud and clear already when discussing the project goals and purpose at the initiation phase.

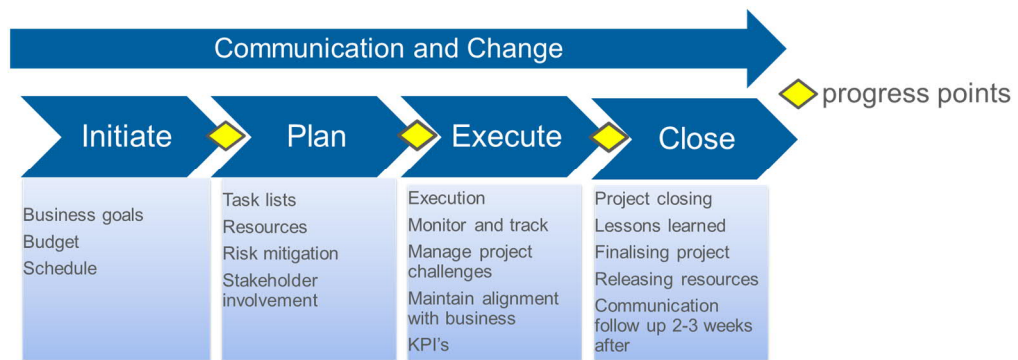
6.3.1 Communication and change plan

Carr (2014) states that communication is an important part of the project. Since the project in question is of a small scale, the communication activities are planned and executed accordingly and the project manager is mainly responsible for organising these activities.

The purpose of change communication is to create awareness and keep everyone in the loop. The aim is to have two-way communication from start to finish. This means it leaves room for dialogue between the participants and promotes open, honest communication. There are also feedback and information sessions that help the project organisation to stay committed. The message in the project is positive and focuses on improving the forecasting process and not just the tool as suggested by Expert C.

- Project communication plan
- Change management plan

Figure 25. Communication and change activities are entwined in the project framework model.



6.3.1.1 Why, what, when and where

Communication activities start before the project initiation or kick-off to the parties involved and continue thereafter as the agreements are reached. The purpose of communication is to create a vision of the present situation and what direction the project is taking and what the expected end result is.

The first message contains what is going to change and why? What does it mean for me and my manager? This is important to stakeholders, reference groups and naturally to users. Communication at this point contains a description of the project plan and who is involved in the project execution, when the Go-Live is, etc. As expert C also stated, the personnel's KPIs can be used in determining the motivation when designing the message. Moreover, what should not be forgotten is the importance of reminding people that the project is aiming for common good according to the strategy goal of the corporation and the case company. It is important to communicate this at all levels and repetition is the key.

Means of communication

Communication is handled mainly through info calls which are done via Skype depending on the agreed and set schedule. Communication to management continues as in the pilot study but as proposed it is also important to have full management support for the project. Project champions are the promoters of positive messages.

Communication activities follow-up is set to 2-3 weeks after the project has been closed to ensure smooth project closing and a return to business as usual. The purpose of this round of communication is also to establish an understanding that the project has been

completed and to obtain feedback from stakeholders. The purpose is also to review what went well and what requires improvement.

Training activities

In the findings, training was one of the points that the interviewees said was lacking. Training is also an important part of business change activities and the development plan. This is where a project champion, such as the key user/s, is helpful in acting as a forerunner in teaching and promoting development. Other training activities and use of a training platform are to be discussed during project planning. It is important to include stakeholders in the training plan and the proposal suggests testing and training for the walkthrough process for a better understanding of the development effort.

6.4 Technical solution

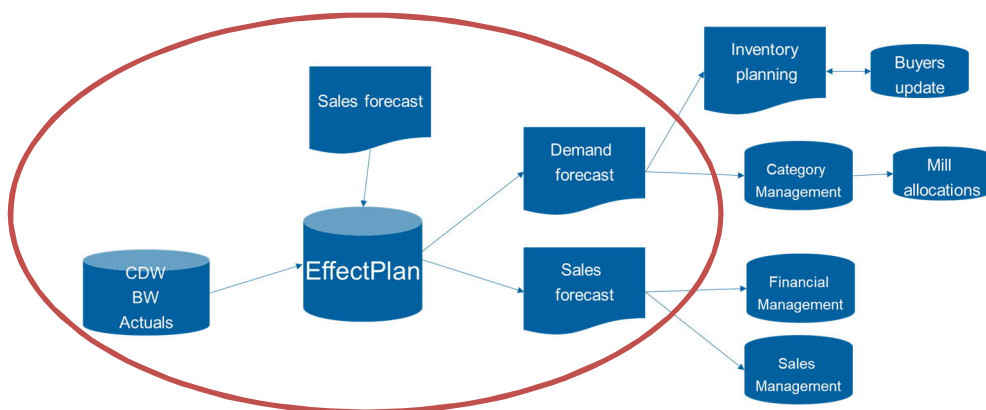
The current template model in Ab would omit an important part of the forecasting data if implemented as such. Therefore, to be able to use and benefit from the forecast data, the outcome of the research shows that the focus needs to be on the following key factors, which must be included in the development:

- Sales area data is available for analysis of volumes
- Parts business area data available
- Scrap information available
- Warehouse locations included

In order to develop the tool to include FIBA forecasts, the data template for FIBA needs to be developed. This requires a separate template for FIBA in Effectplan but this should be further discussed during the initiation phase.

The technical outcome includes importing actuals from CDW through the FIBA template and the new monthly sales forecast is then imported to EffectPlan manually also using the FIBA template. This ensures all forecast data needed are available. After that reports and graphs can be made accordingly.

Figure 26. Technical solution IT landscape



7 Validation of the Proposal

The Proposal of the plan was presented to the PIM development manager and head of PIM on 7 June in a Skype workshop meeting. The presentation started by recapping the research model from defining the objectives to the outcome of the thesis. This was followed by a discussion of the findings made from the process and tool perspective. PIM was also interested in academic research and what the experts in the industry had written. The development model and the elements in it were slightly surprising. This was because the research that was done through hands-on work did not go as originally anticipated. However, PIM was satisfied with the outcome and thought that the major findings were good.

Since the final proposal was approved, the proposal already presented in the previous chapter is the final version of the development model.

The development plan:

Figure 27. Final development plan



The final development plan model concludes the thesis research and shows that this model will benefit the case company in project execution. The three elements in the development plan model are essential to secure a successful execution from start to finish.

8 Discussion and conclusions

Since the merger with another company, forecasting is a relatively new business process in the case company. Especially because Ab and Oy companies have been working on developing their own forecasting processes. This creates an opportunity for cross functional development work. This in turn increases communication and collaboration with Ab and Oy. As said in the literature review, even minor changes in the forecasting development can have a positive impact throughout the supply chain.

Development work always starts with initiation and planning. Many times only the technical side is reviewed but the key elements lie in project management activities and dealing with the organisational change project. Hence it is important to start by making sure there is a common understanding of the project goal and scope. It is also important to align the communication and messages with the strategic goals of the company. The end result should be to reach mutual agreement on the project activities and approval of the development plan.

The technical solution for the development submits that the data can be exported to the tool and this would then be used in reporting and looking at forecasts at the case company level, including all countries. However, the research scope included a study of the EffectPlan tool and therefore there may be other alternatives. There may be possibilities to gather data into Qlikview and combine the forecasts there. This assumption is based on the interviewee finding with Ab administrator who said that Qlikview is good tool to use in collecting data, building reports, viewing and analysing them. But since this was outside the scope of this research it needs to be investigated other than in this thesis.

8.1 Recommendations for next steps

Although the study did not include forecasting process development per se, many key points were introduced in the thesis including forecast accuracy and the error margin, which are important aspects when analysing forecast figures. Also the study clearly shows that forecast development is continuous and hence the next step in the process development should be to look at forecasting from different angles such as product information that can be analysed by product categories or by product line.

In any event, the research included part of the forecast process solution so the work continues. The next steps include planning the project initiation and creating concrete plans. The next task in the project is also to agree and set a project (initiation) kick-off meeting time. The meeting should include the pilot study team and PIM management. The kick-off meeting includes the steps in the model but also a set agenda is to be written including a discussion of the technical solution, an alternative solution with Qlikview and the plan to look into this, and the future outlook in the project, including the long-term forecasting process development goals. The follow-up steps are agreed in the meeting for each topic on the agenda.

The next steps also include a task to conduct a cost of delay analysis. This can be done either as part of the kick-off meeting while discussing ERP implementation or outside the meeting. The important thing, however, is to have it done.

Part of the initiation and planning is to create a communication plan and training plan, and agree and set up the project organisation. The follow-up after the meetings is important in order to have all tasks closed before the project execution starts and also essentially to have roles and responsibilities defined. Long-term development goals should include a plan to see how sales can get involved in starting to use the EffectPlan tool to enter forecasts directly into the system.

However, it may be recommendable to review the overall strategy and align tools and systems with the development activities also in development the forecasting tool. Perhaps this could include an analysis of the direction that has been set and could be taken to.

As things stand at the moment, it seems to be that development should not rely on the ERP system implementation as there may be a further delay and the implementation plans that have been made may be outdated. Hence, a thorough initiation for ERP implementation may be needed for the project. This in turn will require more time and hence may cause further delay. It is recommended that a review that includes the relevant parties involving the ERP implementation project and EffectPlan development tool project is established to gain common understanding and align plans.

8.2 Conclusion

Since the modern world moves rapidly and technology constantly brings new solutions and systems, it would be useful to consider pressing ahead with the development rather than waiting for ERP data and system harmonisation. Simply because in the future there will be even more different types of set-ups and data sets brought by mobile applications, tools and new systems. There may be a greater need to combine data rather than harmonising it with another system.

The plan that was co-created in this thesis sets a framework for many other development projects. Although no two projects are alike, the development plan serves as a model. Finally, it is important to bear in mind that in business transformation, business process development is the key. It is never only the tool that changes.

At the beginning of the research, specific questions were raised; what are the key factors in software tool development and is the development about the best-in-class solution or about business change? These questions were answered in the research and showed that project planning and change management are vital in development of the forecasting tool. After all, no matter how fancy the solution, it is the people that make the change happen.

8.3 Self-reflection

When I started my thesis approximately a year ago, I knew that the research would require a lot of hard work and that it would bring along many long days and sometimes sleepless nights. I was ready to face this challenge and eager to begin my research. However, I never anticipated that the thesis journey would be so rewarding and that while I would be doing my research work, I would also grow personally.

The hardest part in my thesis was the conceptualisation and narrowing down the thesis scope. I had several discussions with my instructor about the objective of my thesis but struggled to define it. Once it was defined, however, it was easier to search for literature for the topics. I definitely now know why this was emphasised in the thesis course and seminars.

S&OP and forecasting were actually fairly new concepts to me. Being a newcomer to the area of S&OP and forecasting, I did feel that someone specialised in this field would have been able to delve deeper into the topic. In fact, at the beginning of my thesis I felt I didn't have enough experience or the knowledge to understand all the detailed information. But I think this was ultimately an advantage since I was able to look also at the big picture.

I had difficulty in keeping my academic part of the research separate from the research I was studying for the case company. My research consisted of a wider part for the company and it was difficult to separate the two. Especially when I was building my proposal, I often found myself thinking about a bigger picture from business side or being sunk into the academic portion. This was challenging as I was also reporting the progress to the case company and to the university.

I thought my strength was my ability to be persistent throughout the thesis. In fact, this was a great advantage in interviews. I conducted more than enough interviews and not all are included in this research. I also thought that the interviews went well and that I was able to maintain my objective view, although at the beginning I might have led the conversations a bit. My persistence was also the thing that kept me going even when I lost the plot in my writing.

Although I searched for a lot of information, I constantly asked questions and had discussions with other stakeholders and I think it would have helped to have had more discussions about the findings together with PIM. Perhaps after round 1 data collection and then after data 2. This could have helped in clarifying matters and perhaps the findings would have been slightly different. However, I still feel that the findings indicate the areas for improvement and are what they present.

While it was not a requirement of my research, I think that my strengths were in my previous experience of working in many different ERP implementation projects. However, I did find this was also a burden since I found myself viewing things from a data angle or process angle.

Having said this, I did feel that my weakness was my inexperience in managing the pilot study. I felt that had I known the principles of project management better and identified the pitfalls in advance, the outcome would perhaps have been different. Because proper project plan was not written or project goals were not defined in detail, this left a gap in communication already from the beginning. Perhaps someone with a strong background in project management would have been able to identify these in advance and thus avoided the challenges in the pilot study.

The thesis journey has probably brought me the biggest learning experiences. It is hard to tell what the learning curve would look like but it has certainly given me confidence both as a professional and a researcher. Through the thesis I have learned to stay more focused, calm and trust myself. This is because when you are doing research, you can easily get side-tracked or lose your way. Thanks to my instructor whenever I did get lost or go too deep into a matter, he guided me to the right path by reminding me where I was and what was the aim for each research phase. The thesis research has also taught me to take responsibility for things even if they take me to my discomfort zone, since while doing research you actually never know where you will end up.

I'd like to thank everyone who was involved and helped me on my journey. A special thanks to my instructor Antti Hovi and my teachers at Metropolia University of Applied Sciences. I would also like to thank the PIM organisation and my colleagues as well as my classmates, Ville Juutilainen, Petri Pertta, Stina Sundman and Niko Neuvonen who encouraged me during the year and helped me to believe in myself. Finally, a special

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List of interviewees, data 1 and data 2

Role	Area of Expertise	Discussion	Date	Duration
Finance Support Manager Oy	Preparation of forecasts, main administrator of Oy forecast tools	Forecasting Process and Tools in FIBA	2.10.2018, 2.4.2019	76 mins, 59 mins
Controller, PIM	Expert in S&OP Finance and business management point of view	Forecasting Process and Tools, S&OP in FIBA	1.10.2018	65 mins
Finance Controller, Oy	Management point of view, S&OP	Forecasting Process and Tools, S&OP in FIBA	2.10.2018	40 mins
Supply Chain Development Manager	Forecasting Process, S&OP another division	Forecasting Process and S&OP Process, best practice	11.10.2018	52 mins
Business Intelligence	Expert in S&OP, CDW	Datawarehouse	14.11.2018	66 mins
Business Intelligence and S&OP	Expert in S&OP, Forecasting, CDW	Data warehouse and Forecasting and S&OP Process	14.11.2018	66 mins
Administrator Forecasting Ab	EffectPlan Development implementation expert, forecasting and S&OP Process	Forecasting Process and EffectPlan development, S&OP	23.10.2018, 15.4.2019	66 mins, 46 mins
IT, ERP Expert Ab	Expert with SAP Ab system, processes	S&OP Forecasting Process IT	2.10.2018	42 mins
Category Manager PIM	PIM perspective, S&OP, Forecasting corporation products	Forecasting Process and Tools, S&OP PIM	15.11.2018	32 mins
Category Manager PIM	PIM perspective, S&OP, Forecasting external products	Forecasting Process and Tools, S&OP PIM	22.11.2018	58 mins
Category Manager PIM	PIM perspective, S&OP, Forecasting external products	Forecasting Process and Tools, S&OP PIM	28.11.2018	44 mins
Sales Manager Norway	Expert knowledge Norway sales process, EffectPlan usage	Forecasting Process and Tools, S&OP Norway	21.11.2018, 8.4.2019	31 mins, 22 mins
Finance Controller, Norway	Expert S&OP, Forecasting, EffectPlan usage	Forecasting Process and Tools, S&OP Norway	26.11.2018	53 mins
Senior Buyer, PIM	Procurement perspective into S&OP and Forecasting	Forecasting Process and Tools, S&OP PIM	16.4.2019	27 mins
Sales Consultant EffectPlan, External	Expert in EffectPlan features, development possibilities	Features, development opportunities, usage of EffectPlan	12.4.2019	35 mins
Expert A, Business consultant	Managing of projects, implementations, business transformation	Project management, software development, projects implementations	11.4.2019	62 mins
Expert B, Software development consultant	Managing of projects, software development projects	Project management, software development, projects implementations	8.4.2019	45 mins
Expert C, Director Service design	Managing of projects, business development, business transformation	Project management, software development, projects implementations	17.5.2019	45 mins
Expert D, Director Telecommunications	Software development, business development, business transformation	Project management, software development, projects implementations	30.4.2019	75 mins

Current state analysis questions; forecasting and S&OP

Date xxx	Column1	Person xxx	Function xxx
Role and responsibility	CSA		
Forecasting process currently in use	CSA		
Tools used in forecasting?	CSA		
What are the improvement areas using the tool/s and (the process)?	CSA		
Major obstacles?	CSA		
Benefits and future outlook?	Development		

Current state analysis; EffectPlan questions

EffectPlan	What was the time frame for the whole implementation?
pros	How are EffectPlan and Qlikview,SAP connected?
pitfalls	How were data templates determined? Organisation involved and also time frame it took
EffectPlan now	How much participation did sales have in the process?
	Has PIM been involved in the development?
	What was the training process?
	What was the communication and Change management process?
	What were the pitfalls in the implementation?
	How feedback on the tool been received and recognized?

EffectPlan questions template; external EffectPlan sales consultant

EffectPlan Sales Consultant			
	Tell me about Effectplan tool?		
	Capabilities of the tool?		
	What is the tool design?		
	Is their reporting model in EffectPlan?		
	Can you build multiple companies in EffectPlan?		
	How do you add data templates?		