Carriers and contents: Retrieval, access and display of performance data in a sales environment

Pulan Li
Abstract

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The fast pace of business growth has brought small and medium enterprises (SMEs) new challenges as the size of business data grows dramatically as well. Instead of archiving all the records in database or printed logbooks as what was done in the old days, enterprises start to consider taking advantage of the potential values of data, for example, to support their business decision via readable results based on analysis of trillions of numbers. A vast demand of business intelligence (BI) tools then emerges, requiring services including agile data analysis and representation with user-specific accuracy as well as excellent usability. Being successfully applied in data analysis process in various fields, data visualization is one of the most popular solutions providing intuitive and effective aggregation to the reviewers. In an investigation conducted by IBM in 2011 among chief information officers (hereafter “CIOs” in short) of 200 enterprises, 83% of them have visionary plans that include business intelligence and analytics.

Together with Uppsala’s local business, S2 communications AB, this thesis investigated data representation of reporting service in a sales-intense telemarketing environment, in which three major research questions have been thoroughly studied:

- Data retrieval
- Data access (carriers of data)
- Data representation and visualization

This thesis used a combination of methods to investigate solutions to these three questions, including both comprehensive client-side interviews and technical prototype development based on company’s business data. A proper attribute set of data was proposed, as well as data access and visualization solutions. Most of resources, e.g., clients and business data, were provided by S2 Communications AB.

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Tryckt av: Reprocentralen ITC
Acknowledgement

First I would like to show my gratitude to my supervisor, Mr. Pär Wästberg, who generously provides me with continuous support and effective feedback on my thesis work. I feel fortunate to have his sharing of his wisdom and experience, from which I benefited a lot for the growth of inspiration and enthusiasm.

I would also like to express my gratitude to Mr. Morgan Sandberg, CEO of S2 Communications AB, for his effort on client interview arrangement, his prophetic and creative advices on my daily work, and the trust he put on me throughout my thesis work.

It is always a great honor for me to work with all the excellent colleagues in S2 Communications AB. Their kindly help leads to the completeness of this thesis. Special thanks must be given to Mr. Ulf Sahlén, whose inspiring discussions and solid technical support enable me to quickly adjust my work to a most effective path. It is also a pleasant experience working together with Mr. Erik Åhman and Mr. Tobias Steen. My classmates in HCI master program, Marten Biehl, Jonas Celander Guss, Bastiaan Boel and Mark Conte, also helped me with enlightening discussions.

Last but not the least, there will never be enough words for me to devote my thanks to the continuous support and encouragement of my family and my best friends.
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Chapter 1 Introduction

As an introduction, Chapter 1 covers background information which is the fundamental theories of this thesis project, including business intelligence, data presentation architecture (DPA), data visualization. Background information of the organization (S2 Communications AB) which supported this thesis project and outline of this thesis has also been provided.

1.1 Overview: Business Intelligence

Business intelligence (BI) is a term originally proposed by IBM researcher Hans Peter Luhn to describe “the ability to apprehend the interrelationships of presented facts in such a way as to guide action towards a desired goal.” [2]. In 1989, Howard Dressner, a Gartner analyst, used this term to describe “concepts and methods to improve business decision making by using fact-based support systems” [3]. Before the term “BI” coming out, the name “Decision-support system” (DSS) was more widely used in early 1970s.

A typical BI framework contains two major activities: getting data in (data warehouse), which is accomplished by the process of extraction, transaction and loading (ETL), and getting data out (business intelligence), illustrated in Fig.1.1 [4]. This thesis mainly focuses on the activity of getting proper data out of database and representing selected data in company’s reporting service, including data retrieval, access and client-oriented data visualization.

Fig.1.1. A typical business intelligence framework [4].
There are various benefits of deploying BI into business. Firstly, it provides enterprises with thorough and effective business data analysis with accurate aggregation of raw data which helps setting up crucial correlation hypotheses for business decision making. Secondly, delivery of analytical results can be launched once corresponding queries are made by end users, further furnishing the result delivery process with better utilization and efficiency. Proper representation of aggregation results also offers readable analytical results on a higher level, improving effectiveness and efficiency of decision making, thus brings down cost of time for managers, executives, etc, to analyze data. With a comprehensive view of enterprise’s key performance indicators (KPIs), enterprises can make best plans of their business strategy to improve profitability.

Throughout years, numerous BI technologies with different degrees of complexity have been developed and have been confirmed as essential tools in real business, including online analytical processing (OLAP) [5], data mining, business performance management, predictive analytics, prescriptive analytics, business reporting, etc. There are many well-know companies, e.g., IBM, SAP, SAS, Oracle, etc, providing compelling BI solutions with powerful analytical calculation and visualization ability, some dashboard examples of which will be studied in section 3.1.2.

1.2 Data presentation architecture (DPA) and data visualization

As shown in Fig.1.1, one crucial part of BI application which greatly affects the usability of BI applications is the process of data retrieval, access and representation. Thus, data presentation architecture (DPA) should be carefully designed in BI applications in order to optimize the effectiveness and efficiency of identifying, structuring and presenting of data.

Data visualization, also known as visual representation of data, illustrates abstracted and aggregated information [6]. Data visualization has been applied in various business and research fields, including information graphics, statistical graphics, etc, with many techniques involved, from data acquisition, data analysis to database management. In this thesis, data visualization is investigated together with data retrieval and access, in order to provide clients with effective and efficient business data analysis in a sales-intense environment, thus support clients’ business decision making process.
1.3 Organization briefing, motivation of thesis

S2 Communications AB ("S2" in short hereafter, website: [http://www.s2.se/](http://www.s2.se/)) is a Swedish company located in Uppsala, Sweden, supplying high performance sales system to marketing-intensive companies. S2 customer relationship management (S2CRM) system provides a Web-based production environment integrated with IP telephony, which is suitable for sale- and contact-intensive activities. All relevant data are recorded in S2’s server, and can be exported by clients as well as be imported to other information systems.

The system can be accessed via hyperlink [http://www.s2.se/logga-in](http://www.s2.se/logga-in).

Among all the functions provided by S2CRM, this thesis mainly focuses on its reporting service, highlighting on retrieval, access and representation of data extracted from clients’ business process in a sales-intense environment. This thesis project aims to deliver a comprehensive, structuralized set of intelligible reporting service prototypes with ease of use, user-friendly interface and delivery methods according to clients’ requirements.

1.4 Outline of thesis

The remaining part of this thesis is organized as follow:

Chapter 2 describes outline of this thesis project, including research questions, methodology, roles involved, clients briefing and project timeline.

Chapter 3 describes and discusses process and results of client interview.

Chapter 4 demonstrates process and results of prototype development.

Chapter 4 summarizes this thesis project and proposes potential development of S2CRM’s reporting service.
Chapter 2 Project Outline

As described in Chapter 1, according to the increasing demand of reporting service with enhanced analytical ability from end users shown in the feedback from their clients, S2 planned to improve their existing reporting service by investigating current use cases and the expectation among S2’s clients, and then improving the overall performance of S2CRM’s reporting service so as to increase the value of this service for both S2 and their clients. The targeting use cases are for sales coaching, including both group sales coaching and individual sales coaching. This thesis project aims to enhance the following aspects of S2CRM’s reporting service:

- Effectiveness: deliver the most useful data to clients’ business;
- Efficiency: propose efficient delivery methods according to clients’ use pattern;
- Satisfaction: design proper layout of information to increase ease of use.

Based on the project goals, the remaining part of this chapter discusses project outline accordingly, including research questions, methodology, roles involved, technical development environment and project timeline.

2.1 Research Questions

This thesis project attempts to answer the following research questions and develop S2CRM reporting service prototypes accordingly:

- Who is/are the target client group/-s?
- Why do target clients need reporting service of S2CRM?
- How frequently do target clients use reporting service?
- How do target clients use reporting service?
- What data do target clients require on reporting service?
- On which carrier do clients want reporting service to be delivered?
2.2 Methodology

Case study

Before starting client-side requirement analysis and prototype development, study on S2CRM and stereotype of business process of S2’s clients is a prerequisite, in order to understand how the system works during clients’ business processes, thus guarantee the following interview/prototyping stages run closely to the real cases. Case studies are also conducted on dashboard samples of existing reporting service as an overview on current industrial solutions, including sample reports of MS SQL Server Reporting Service (SSRS), Telerik reporting, and Crystal Reports (Xcelsius).

Client interviews

This approach collects feedback, requirements and expectations on S2CRM’s reporting service from S2’s clients. This method includes preparing background questionnaire and interview questions, conducting one-on-one interviews at clients’ offices, analyzing qualitative and quantitative data. Details of this method (questionnaire, interview details) are described in Appendix.

Prototype development

Photoshop prototyping is used at the beginning phase of reporting service design, for its relatively fast development speed and powerful visualization capability. The results of Photoshop prototyping are used in client interviews so as to give clients a concrete view of ideas on reporting service development. Then Visual Studio prototyping is used after client interviews to build a functional Web form with Telerik report integrated, which provides user interaction in a comprehensive reporting service.

2.3 Roles involved

This project was conducted jointly by S2 Communications AB and Uppsala University.

- Project worker: Pulan Li (Uppsala University)
- Project supervisor: Pär Wästberg (S2 Communications AB)
- Client contact, interview scheduling: Morgan Sandberg (S2 Communications AB)
- Technical consultant: Ulf Sahlin, Tobias Steen (S2 Communications AB)
- Clients (interviewee): see Chapter 3.
- Thesis reviewer: Lars Oestricher (Uppsala University)

2.4 Technical development environment

Hardware: HP EliteBook 6930p
OS: Windows 7 Professional
IDE: Microsoft Visual Studio 2012
DBMS: Microsoft SQL Server 2012 Express
Visualization tools: Photoshop CS3, Telerik reporting Q1
Programming language: SQL (data retrieval), C# (report customization)

2.5 Project timeline

Fig. 2.1 shows timeline of this thesis project.

Fig. 2.1. Project timeline.
2.6 Conclusion

This chapter describes outline of this thesis project, from research questions, methodology used in this project, development environment, roles involved, to project timeline. Details of methods and deployment of corresponding methods into project are described in Chapter 3.
Chapter 3 Case Study and Client Interviews

Since the actual development of reporting service is based on case study and client interviews, the results for three research methods mentioned in Chapter 2 are split into two chapters. Firstly the results of case study and client interviews, which are also the input of the next stage of development, will be presented and discussed in this Chapter (chapter 3), and results of prototype development will be presented in Chapter 4.

In case study section, the business process of S2CRM and current reporting service will be described and analyzed, following a thorough study on current dashboard examples of reporting service products in the market. In client interviews section, firstly a brief introduction of clients involved in interview stage will be made, following the data retrieval, access and representation that these clients required according to the interviews.

3.1 Case study

This section covers case study on S2CRM and its existing reporting service and different sample reports listed in section 2.2.

3.1.1 S2CRM, S2CRM reporting service

S2CRM provides three fundamental functions for their clients’ business processes:

- Ordering: contact customers and record ordering information, e.g., order number, order value, product name, etc.
- Booking: contact customers and record booking information, e.g., time and venue record, modification and cancellation of bookings, etc.
- Survey: contact customers and record survey results.

S2CRM extracts and transforms transaction data throughout client’s business process and then loads data into its database. The activities include contacting new customers, recording customer’s feedback to modifying/cancelling of order/meeting, managing re-call ring pool, etc. Collected data includes outcome of calls, order/booking/survey details,
qualitative feedback from customers, etc, in time/project/employee subtotals. Employees perform different levels of activities, thus hold different system access authorizations accordingly. Fig.3.1 shows how S2CRM works during one ordering business process with one agent and customers involved.

![Diagram](image)

**Fig.3.1. S2CRM in ordering process.**

By default, there are eight types of outcomes, which can be grouped into four categories:

- **No response/Error:** Ej svar (no answer), upptaget (line busy), Svårnädd (difficult to reach), Fel (error)
- **Re-contact:** Återkom (contact later), ÅterkomPrio (contact later with specific salesman)
- **Reject:** Nej (no/refuse to take the order)
- **Order:** Order

During transactions, S2CRM records every entry of outcome with details of time log, user and project information. For outcomes marked “Återkom” and “ÅterkomPrio”, the customer information (kundkort) will be sent back to S2CRM’s ring pool for recall management. For rejection outcomes, S2CRM provides a text field for salesmen to record client’s qualitative feedback. For order outcomes, S2CRM stores order details including order time log, customer information, order value, order number, product details, etc.

Business data listed above can be retrieved and viewed in S2CRM’s reporting service. Fig.3.2 is a screenshot of S2CRM’s Web-based reporting service, with the view of (a)
selection pane and (b) updated report. S2CRM provides clients with reporting service on performance, sales, products, bookings, logs and telephony, shown in the grey tabs on the top of selection pane.

Fig.3.2. S2CRM Web-based reporting service (under performance tab). (a) selection pane; (b) updated report.

As illustrated in Fig.3.2 (a) and (b), clients have access to quantitative data including number of outcomes, active time, etc., of specific project/user, or during specific periods, or
using a unique set of outcomes in a comprehensive table generated by Microsoft ReportViewer. Clients can change dimensions of reports, update reports, and export reports to Excel spreadsheets.

Table-based report reveals details of business process; however, fine data granularity increases the workload of data analysis for higher-level information e.g. overall sales inclination, outcome patterns during certain working period using table view, thus brings down the effectiveness and efficiency of business decision making.

3.1.2 Sample reports study

**SSRS PowerView Reports**

Microsoft SQL Server Reporting Services (SSRS) is a server-based reporting platform that provides comprehensive reporting functionality for a variety of data sources [7]. Fig 3.3 is a screen shot of demo dashboard report in PowerView.

![Gas Price Impact on Models](https://businessintelligencedemoportal.com/sites/autosales/SitePages/pvrsample.aspx)

**Fig.3.3.** Screenshot of SSRS PowerView report.
This report demonstrates gas price impact on different car models. Cumulative sales and margin sales are jointly displayed in a bubble chart with flash animation to show the pattern transition of sales performance with regard to different quarters from year 2006 to 2011, grouped by different models of cars. A line chart below shows the pattern of gas price changes versus quarters correspondingly. Detailed sales data of each model can be observed in textboxes by cursoring over bubbles. This report has a scalable data granularity with accessibility of both drill-down (fine-grained granularity) and roll-up (coarse-grained granularity) data, providing end user with direct access to data on various levels.

**SAP BusinessObject dashboard (formerly Xcelsius)**

BusinessObject (“BO” in short hereafter) has become a part of SAP AG since 2007, providing services including reporting, enterprise information management and performance management, etc [8]. Fig.3.4 is a screen shot of SAP BO dashboard on sales and profits of an organization. By choosing specific region on the drop-down box on the top of dashboard, relevant sales and profits data by industry will be shown in a bubble chart, meanwhile, sales & profits details by sub industry will change accordingly in the bar chart.

![Sales & Profits by Industry](http://www.sdn.sap.com/irj/scn/index?rid=/library/uuid/50c39190-62c0-2e10-7ab4-82128be893fe)
Similar to SSRS PowerView report, BO dashboard provides a good hierarchy of data granularity, from aggregated view to details of numbers. Animations are also available to demonstrate changes of patterns. The bar/line chart on the right-hand side varies as point hovering on different sub-industries.

3.2 Client interviews

3.2.1 Client briefing

Bonniers Business Publishing AB

Bonniers Business Publishing AB ("Bonniers" in short hereafter) is a branch office of Swedish mass media giant Bonniers AB, located in Stockholm, Sweden. The targeting department of client interview is Bonniers’ sales division. The products they sell include subscription of digital version of magazines, training courses on industrial softwares, etc. They conduct multi-tier projects on different subscribers. They run outsourcing projects as well as inhouse projects. The interview was conducted together with Charlotte Carlén, sales manager of the company.

Topsell AB

Located in Sandvikan, Sweden, Topsell AB ("Topsell" in short hereafter) is a fast-growing telemarketing-based SME providing sales management service of energy products. They recently expanded organization size and planned to hire more employees in the near future. Salesmen at Topsell contact new prospects via cold calls and handle re-calls using S2CRM’s “Order” function. Managers at Topsell decided to launch new “booking” function soon. The interview was conducted together with Micke Löfdahl, CEO, strategic manager and owner of the company.

Bokningsservice i Sverige AB

Bokningsservice i Sverige AB ("Bokningsservice" in short hereafter) is a Swedish service provider offering high-quality meeting arrangement, of which the head office is located in
Kungsgatan, Stockholm, Sweden. Bokningsservice offers high-quality meeting arrangement, including booking, modifying and cancellation of meetings. Their clients are mainly in the field of finance, insurance, private investment, etc. S2CRM is the information system they used for booking and tracking meetings. The main function of S2CRM they use is “booking”. The interview was conducted together with Bokningsservice is Christian Silfversvård, owner and CEO of this company.

*Call-up AB*

Call-up AB (Call-up” in short hereafter) is a telemarketing and sales company with two call centers located in Uppsala and Gävle, specializing in sales orders, with the major clients in the field of banking, finance, insurance, media and telecommunication [9]. The main function of S2CRM they use is “Order”. Multiple projects are running in parallel at Call-up for different clients. The interview was conducted together with Johanna Bergström, sales representative of Dagens Industri at Call-up’s Gävle office.

**3.2.2 Why do clients use reporting service?**

Based on the results of client interviews, reasons (or potential reasons) why clients use S2CRM’s reporting service in a sales-intensive environment are concluded. Interview framework was designed according to the following questions (these are also main questions for decision makers to answer in order to refine business strategy):

- What has happened?
- Why did this happen?
- What will probably happen in the future?

Fig.3.5 lists possible answers to these questions. Business data is an important reference for sales managers to monitor what has happened and what is going on in the sales teams using descriptive analytics, and to deploy effective projects based on predictive analytics, e.g., group/individual sales coaching, campaign planning and work schedule planning according to the analysis on loaded data.
3.2.3 Use pattern of existing S2CRM reporting service

According to the results of interviews, clients tend to use reports generated from current Web-based reporting service as a data source for their own business analysis rather than directly using it as a comprehensive reporting tool as a reference for business decision making. Fig.3.6 shows the general use pattern of S2’s clients. Clients manually select data after generating a report spreadsheet from S2CRM (via Web directly, or exported Excel spreadsheet, or a printed version of spreadsheet), and do visualization manually, both by drawing numbers and figures on white board or by using visualization tools Excel.
3.2.4 Requirement analysis: contents of data

Data Description

Before starting requirement analysis on data content, concept of “OLAP cube” in online analysis processing (OLAP) is referred in this thesis in order to accurately and systematically build data model in S2CRM. OLAP Cube describes data measure in different dimensions. Multiple dimensions can be jointly used to comprehensively and accurately describe data. Each cell of the cube holds a number that represents measures of the business, such as sales, profits, expenses, budget and forecast [10]. Fig. 3.7 demonstrates measures and dimensions of business data analyzed in this thesis project.

- Measures: Performance data (outcomes, order values, order numbers)
- Dimensions: time, project, employee

![Fig.3.7. Measures and dimensions of business data in S2CRM.](image)

According to the sample data provided by S2, this thesis mainly focuses on data analysis and visualization of outcome statistics and sales statistics.

Outcome Statistics

Measures involved: answers of ineffective results (Fel, Upptaget, Svårmådd, Ej Svar) are not interesting at client side. The main goal of digging into outcome data is to see "what has
happened” and “why did this happen”, which means that successful answers as well as negative feedback from customers are equally important. For “Nej” answers, managers want to know why customers refuse purchasing their products; for “Order” answers, the details of orders are the most important data (which will be discussed in detail in sales statistics analysis); for “Återkom” and “ÅterkomPrio”, the efficiency of cold calls and re-called of specific salesmen could be revealed. Corresponding representation of data above should be considered in reporting service development.

By project: since different projects have different strategies and emphases (e.g., some projects focuses on number of orders since the price of products is relatively low, and some projects focuses more on the grand value of sales), scope from project dimension is essential for sales manager to monitor outcome performances separately and accurately. This dimension provides a relatively higher-level view of performance data for managers.

By time: statistics according to time is one of the most powerful analyses for clients to make business decision especially on scheduling, both in fine-grained and coarse-grained data granularity. Monthly/Quarterly patterns of outcome performance can be useful for sales coaching, product sales strategy, customer preference analysis, etc. Daily patterns of outcome performance act as a solid reference for daily work pattern arrangement. Call per hour is also a crucial number that managers will look into to monitor the working efficiency of employees.

By employee: managers who conduct sales coaching have high demand of individual data jointly representing outcome statistics and sales performance. Comparison within certain employee’s performance combined with time dimension, as well as comparison between different employees are two most highly-requested data sets from S2’s clients.

Sales Statistics

Measures involved: for sales performance, two fundamental measures are order number and order value. According to different projects, these two measures are of different priorities in sales manager’s consideration. Analysis on sales performance data is an important reference for conducting workload arrangement, sales coaching, campaign planning, client behavior analysis, etc.
By project: same as outcome statistics, since different projects have different characteristics, project dimension provide managers more specific views on sales performance thus leads to more accurate business decisions.

By time: similar to outcome statistics. Order numbers and order value aggregated by time can help with client preference analysis, active period of clients and work pattern analysis.

By employee: similar to outcome statistics by employee. This is one essential view that managers want to see in S2CRM’s reports, which existing system doesn’t provide.

3.2.5 Delivery methods: which carrier do clients prefer?

At the beginning of this project, through internal discussion with S2’s employees, several carriers were proposed as most promising delivery methods for sales coaching based on S2’s business strategy and were further discussed together with the clients during interviews. The carriers include:

- Web-based report
- TV-based report
- SMS-based report
- Tablet-based report

And the grading results were extracted by orally asking clients to rate their demands on these four carriers in three levels (“highly demanded”, “neutrally demanded/good to have”, “not demanded”) . The grading results are listed in Table 1.

<table>
<thead>
<tr>
<th></th>
<th>Web</th>
<th>TV</th>
<th>SMS</th>
<th>Tablet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bonnier Business</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
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<tr>
<td>Publishing</td>
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<tr>
<td>Service</td>
<td>2</td>
<td>2</td>
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<tr>
<td>Topsell</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Bokningsservice</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Call-up</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 1. Grading of carriers by different clients.
(“2”: highly demanded; “1”: neutrally demanded/good to have; “0”: not demanded)

According to the results, **Web-based reporting service** ranks top, followed by **TV-based reporting service** and **SMS-based reporting service**. These three carriers were selected in the development stages of this thesis project.
Chapter 4 Prototype development

In this chapter, results of prototype development stage will be demonstrated and analyzed. As discussed in chapter 3, results of case study and client interviews act as the input of prototyping stage, which means all the development decisions are made according to clients’ requirements. This chapter consists of four parts: prototypes of

1) Web-based reporting service,
2) TV-based reporting service,
3) SMS-based reporting service and
4) Tablet-based reporting service.

This chapter emphasizes on overall development process description and discussions on reporting service prototypes. More technical specifications are included in appendices.

4.1 Web-based reporting service

Incremental development method was chosen for Web-based reporting service development. Two prototyping stages were involved. Prototypes of Web-based reporting service were developed firstly by Photoshop (PS prototypes) and were used during client interviews. A more in-depth Web application design in Visual Studio was carried in parallel according to qualitative results from client interviews, using actual data stored in MS SQL Server 2012 Express and Telerik reporting tools.

Photoshop Prototypes

Fig.4.1 (a) shows an integrated view of reporting service in S2CRM, loaded in Google Chrome browser. The selection panes are categorized into shortcuts selection and specific period selection, in order to provide clients a structured interface with fewest clicks to reach the exact reports.
Fig. 4.1 (a). A comprehensive view of redesigned S2CRM reporting service in Google Chrome browser.

Access to both data spreadsheet and data pattern (graphical reporting view) is provided, as illustrated in Fig. 4.1 (b). An “Individual Performance” report tab is also added based on interview results, which will be discussed in detail in “Visual Studio prototypes” session.

Fig. 4.1 (b). Access to both data spreadsheet and graphical report.

Fig. 4.1 (c) and Fig. 4.1 (d) are Photoshop prototypes of outcome statistics and sales statistics. For outcome statistics, an overall view is design for outcome composition analysis,
followed by outcome distributions according to time periods and employees. A table of detailed data is also provided at the end of the report. For sales statistics, ranking analysis is provided by listing best selling products and top salesman, meanwhile detailed data is also attached.

Fig. 4.1 (c) A Photoshop prototype sample of outcome statistics. Data in this figure are random numbers.
Fig. 4.1 (d). A Photoshop prototype sample of sales statistics. Data in this figure are random numbers.

Performance data versus time/individual are visualized using different types of charts. In general, chart visualization is based on the following principles:

- Bar charts are chosen to visualize comparisons within and between different attributes (e.g., within one project, between different individuals).
• Pie charts are chosen to visualize composition of outcomes.
• Line charts are chosen to visualize patterns, trends, fluctuations, etc.
• Details of data under visualization should be easy to access.

**Visual Studio Prototypes**

Based on Photoshop prototypes, Visual Studio (“VS” in short hereafter) prototypes of reporting service was developed. Fig. 4.2 is a screenshot of VS workbench in designer view. Toolbox lies in the left-hand side pane, and solution explorer is in the right-hand side pane together with “property” pane. At the bottom of the workbench, SQL data sets used in this project are listed.

![Visual Studio Prototypes](image)

*Fig.4.2 Workbench of VS prototyping (designer view).*

Tools in Telerik reporting Q2 was used to build report application in VS. All the visualized components were developed using components in Telerik reporting. Each visualized component uses one data set extracted from sample database via SQL. Different components can either share data set or use unique data sets. Sample database were
implemented in MS SQL Server 2012 Express by segmenting and importing .xlsx raw data spreadsheets were provided by S2. This sample database covers 4 projects during 5 months (from 2012-05-01 to 2012-09-01) with 38 salesmen involved. There are 545 order records in 137,058 outcome records in total. 11,525 login histories are stored in a separate table, which is not discussed in this thesis project. Fig.4.3 demonstrates the structure of sample relational database. “Sales” schema is applied on outcome table and order table, which are the fact table of this sample database. Information of time dimension is included in “moddate” and “orderdate” column correspondingly. Project table with primary key of “ProjectID” acts as project dimension, while employee table with primary key of “UserID” acts as employee dimension.

Fig.4.3. Sample database structure used in VS prototyping (some contents are not provided due to confidentiality reason).
C#-based Web applications with reporting service integrated are shown in Fig.3.11 (a), (b) and (c). Full reports with development specifications are included in appendix. All the reports can be exported in the forms of .cvs, .pdf, etc, an essential feature for report distribution requested by clients.

Fig.4.4 (a)
Fig. 4.4 (b)

Fig. 4.4 (c)

Fig. 4.4. VS Web prototype of (a) Outcome Statistics, (b) Sales Performance, (c) Individual Performance.
In detail, measure data of outcome statistics is visualized on several dimensions. Firstly, data is separated displayed according to different projects, which can be selected on the selection pane on the top. The first view is an overall pie chart showing composition of outcomes, following a table of specific number of all the answer types and the percentage divided by grand total. This data is useful to as a general reference of project and sales team efficiency in group sales coaching. Order distribution by time is illustrated both in larger time scale (monthly in Fig.3.11) and smaller time scale (hourly in Fig.3.11), to reveal sales patterns accordingly. Distribution by time is an important reference for sales managers to properly schedule working hours and work shift.

Measure data of sales performance jointly displays order number in Measure.Outcome table and order value in Measure.Sales table, providing a comprehensive data pattern no matter the project focuses on any one of each or both. Details of measures can be reached via queries since they are related to project, product and employee schemas. Measure data of sales performance also offers access to top salesman information visualized by bar chart, which is an intense motive to employees during sales coaching.

One new tab introduced in this project is individual performance tab. Since sales managers conduct group sales coaching as well as individual sales coaching, a shortcut to a comprehensive salesman’s performance is necessary. As shown in Fig.3.11 (c), details of employees are listed functioning as a concise name card, following by two bar charts illustrating salesman’s performance by different time scales correspondingly. This comparison within salesman him/herself can greatly motivate salesman in sales coaching, according to clients’ requirements. Details of orders are also placed below, for quick search and order tracking.

4.2 TV-based reporting service

TV-based reports are highly appreciated by sales managers for its enhanced visualization ability, which is an utmost suitable solution for group sales coaching. Fig.4.5 (a) and (b) shows a Photoshop prototype of TV-based reports. The highly-requested contents on TV-
based reports are 1) top list of salesman, with fresh, real-time data; 2) progress overview, to demonstrate overall performance for the whole sales team.

Fig.4.5 (a). TV-based reporting service, top list view (Courtesy of Ulf Sahlin).

Fig.4.5 (b). TV-based reporting service, progress overview (Courtesy of Ulf Sahlin).
Fig.4.5 (a) is a TV-based reporting service showing top list of salesman together with key data individual performance (order number and order value). During interview session 2 out of 4 clients requested real-time information being shown on TV screen as a driving force on salesmen performing better by see the results immediately throughout competition.

Fig.4.5 (b) demonstrates a TV-based progress overview. Numbers of expected goals are shown as well as the sales achieved at the moment this report is generated. If the goal is achieved, red color is set to the number provoking alert to sales team. Green color is used for achieved goals.

4.3 SMS-based reporting service

Fig.4.6 shows two Photoshop prototypes of SMS-based reporting service. SMS reports can be used both as notification of order/booking and also as a shortcut to Web-based report as Internet connection is widespread thanks to the popularity of smartphone. Due to the limited contents and display of SMS, the message should be concise and accurate.

![Fig.4.6. Photoshop prototypes of SMS-based report.](image-url)
4.4 Tablet-based reporting service

Tablet-based reporting service can be integrated into a tablet App. It advantages in a bigger display screen compared to SMS screen. Although not the main focus of this thesis, Photoshop prototypes of tablet are also demonstrated here in Fig.4.7 (a) and (b), both in App and in Web-based view.

One of the considerations in tablet-based reporting service design is the consistency of interface. Fig.4.7 (a), an example of top list of salesmen on an iPad, has a consistent look-and-feel inherited from TV-based reporting interface. A gradual decrease of font size is introduced as salesman’s performance ranks lowerer on the list, providing ease of reading to the list. Ranking can be done on sales order and/or sales value, based the client’s specific needs. Shown on the left pane, it is relatively easy to switch between different reports in a tablet App by simply clicking virtual buttons. At the same time, Fig.4.7 (b) demonstrates the accessibility to Web-based reports of tablet-based Apps.

![Fig.4.7 (a). Photoshop prototypes of tablet (App view).](image-url)
Fig. 4.7 (b). Photoshop prototypes of tablet (Web view).
Chapter 5 Conclusion and Future Work

5.1 Conclusion

Information technology becomes one of utmost features pacing up the growth of business, especially in those whose business progresses are running in a sales-intense environment with IP telephony involved. S2CRM establishes a successful customer relationship management information system by providing their target clients with server-client-based data transaction model, allowing access to sales process via Web browser in arbitrary locations and time. Flexibility and simplified technology maximize usefulness and accessibility of S2CRM, meanwhile bring down cost of training and deployment.

One typical feature of Web-based information system is that all the transaction data related to business process in S2CRM is recorded in S2’s database servers. This provides S2 with the possibility of retrieving and representing clients’ data as a business intelligence tool for business decision support. For this purpose, S2 has already developed a spreadsheet-based reporting service. End users are able to generate detailed sales/booking statistics with respect to different projects, periods, agents, etc. using this reporting service. However, table-based reports with fine data granularity require clients to do aftermath calculation and manual visualization, which greatly hinders efficiency of business decision making process.

The main aim of this thesis project, thus, is to develop a comprehensive set of reporting service prototypes based on existing data model (in this case, data related to outcome, orders and log were given), with effective data contents and proper data visualization on various carriers according to S2’s clients’ requirements. Among various use case scenarios, this thesis project focuses on reporting service in SMEs’ sales coaching. In order to reach this goal, requirement analysis and prototype development have been done jointly, with results collected from the former one acting as essential reference for the latter one.
Before retrieving and visualizing data, it is very important to know why clients need this service. Generally speaking, clients want to know the answers to the following questions in order to adjust their strategies and make swift decisions:

- What has happened?
- Why did this happen?
- What will probably happen in the future?

By conducting interviews based on these three questions, requirements on data contents were extracted from the clients. The results of client interviews (mostly sales managers) reveal the fact that different representation methods should be chosen for measure data in different dimensions accordingly. For example, sales managers wanted to know the pattern of work during one day in order to plan the whole sales team’s schedule, e.g., when to have meeting, when to put more resources on sales process, etc., in which case a continuous line pattern works efficiently and accurately.

5.2 Future works

**Digging into clients’ requirements:** client interview has the effect of bringing crucial feedback and new ideas of business, not only for company’s future horizontal development, but also for boosting clients’ business (what information system is primarily supposed to do), especially while developing business intelligence tools. Thorough client interview is suggested if the company wants to enter a new service market.

**Dashboard view of reports:** This thesis also proposed a new approach – individual performance dashboard, according to the interview results, which is very useful and highly demanded for individual sales coaching process. During the development stage, SQL was used to query data from sample database. Good segmentation of raw data in RMDBS can greatly reduce the time of generating/updating reports. There are also new approaches like project dashboard, product sales dashboard being proposed in this thesis, however not developed yester because no relevant data was provided. Further development can be done accordingly.
**Data granularity, accessibility:** Since data visualization itself is an aggregation of all low-level numbers, a proper design of data granularity that matches clients’ requirements needs to be considered. At the same time, accessibility of both drill-down data and roll-up data should be always provided to the clients.

**Consistency and simplicity of design:** if multiple carriers are chosen as part of company’s future strategy of reporting service, considerations on consistency and simplicity of interfaces should be put on the highest priority level. A consist look-and-feel of interfaces with simplified user interaction greatly enhances usability of information system and burgeons business branding.
Bibliography

A. References for thesis writing:


[7] SSRS sample reports website
https://businessintelligencedemoportal.com/sites/autosales/SitePages/pvrsample.aspx

http://www.sdn.sap.com/ir/scn/index?rid=/library/uuid/50c39190-62c0-2e10-7ab4-82128be893fe

[9] Call-up AB:
http://www.call-up.se

B. Reference for SQL writing:

Appendix

A. Web-based reporting service design

1. Data segmentation

Sample data that S2 provides are in three spreadsheets: log, sales and outcomes, covering user IDs, project IDs, timestamps, and performance data selected from S2CRM database. User and project details are not visible due to confidentiality issues. Information is segmented into different schemas based on 1NF and 2NF. Since client-specific data is not provided, random data was manipulated in corresponding tables. An overview of data segmentation is shown in Fig. 3.10. Here is a more detailed description.

a) Sales schema
   Sales schema contains two tables: outcome and order. Order and Outcome tables are related since Order is one outcome in Outcome table. Order table records more details of ordering including order ID, order value and order number, while outcome table records concise information of every action that salesmen have done. The primary key of Order table is orderID, and the primary key of Outcome table is outcomeID. Both primary keys are not given by S2 and are manually generated by the author.

b) Employee schema
   All the information (e.g. employee ID, name, email address, phone number, salary, etc.) related to employees will be recorded in this schema. In this project, one table is used in this schema: employee. The primary key of employee table is employeeID, and other columns in this table records employee information, here in this case, First_Name and Last_Name.

c) Project schema and Product Schema
   These two schemas are not used in this project. The usage is similar to Employee schema, storing detailed information on projects and products in various tables.
2. Data acquisition

a) Outcome Dashboard

One entry of outcome is in form below:

<table>
<thead>
<tr>
<th>Outcome ID</th>
<th>Employee ID</th>
<th>Project ID</th>
<th>Timestamp</th>
<th>Outcome type</th>
</tr>
</thead>
</table>

For overall number of outcomes, COUNT aggregation function is used for counting number of different outcomes, grouped by outcome types using GROUPBY command. Constraints of project ID is added, of which value is delivered by global report parameter after user chooses one specific value.

The case for outcome by employees is a bit more complex since there are two groupby command required: employee ID and outcome type. A crossbar tab in Telerik tool can handle this requirement; in this case SQL queries are written directly to retrieve data from sample database.

The major issue of implementation of outcome by time is to select data based on proper and accurate datetime information for data representation. Since in real cases there can be empty entry for certain time (month, day, hour), all the null data should also be retrieved instead of being omitted since x axis of line representation is a continuous value of time. For this purpose ISNULL() function is used to assign a “0” value to empty entries according to time. CONVERT() function and DATEPART() function are also used to retrieve proper time value/format from timestamp. DATEADD() function shows the value within a certain range of period (yesterday in this case).

b) Sales Dashboard

One entry in order table is in form below:

<table>
<thead>
<tr>
<th>Order ID</th>
<th>Employee ID</th>
<th>Project ID</th>
<th>Timestamp</th>
<th>Order Value</th>
</tr>
</thead>
</table>
By counting number of entries using \textit{COUNT()} function, order number can be retrieved. Order value aggregation is done by \textit{SUM()} function. \textit{GROUPBY} order provides views in the dimensions of different employee as well as projects. Retrieval of sales data in the view of time dimension is similar to that of outcome data. Order value and order number are both shown in the bar charts, providing a comprehensive view of sales data, sorted by \textit{ORDER} order.

c) Individual dashboard

Individual dashboard is a new concept proposed in this thesis project. According to clients’ demands, individual performance both in large time scale (monthly, daily) and small time scale (hourly) is visualized. The queries are similar to those of outcome dashboard. Bar charts are used both views for a better effect of comparison. Detailed information of orders is listed in the form of table, including order ID, order date, unit price and number of ordered product (not shown in this case) with project sum and grand total sum.

3. Data representation

Data representation is done by binding report items (chart, crossbar, table, list, etc) in Telerik Reporting Q2 together with selected SQL data sets. Default settings can be changed by modifying options in “Properties pane”. Flexible content alignment can be done by using “List” tool which provides a pane of free space.

Moreover, flexible customization of report is done by programmatically developing report using C# and intervene report processing via event handlers. The lifecycle of Telerik reporting starts with creating Report Definition. Initialization of an object is done in this stage with default settings. Then it follows the process of binding data source to this object. Several events are available to intervene in this binding process and to change the default settings of reports, in the actions of which customization of report can be performed. Three types of \texttt{EventHandler} (\texttt{ItemDataBinding}, \texttt{NeedDataSource}, \texttt{ItemDataBound}) could be used before and after data binding process, as well as in the cases that data source is of null value.
## B. Interview Documentation

### 1. Background Questionnaire

**Bakgrundspågor**

**Personal Information**
- Name: ________________
- Company: ________________
- Occupation: ________________

- How long have you used S2CRM?
  - Less than 1 year
  - 1-2 years
  - 3-5 years
  - More than 5 years

- Which purpose(s) listed below matches your use of S2 reporting service?
  - Sales coaching
  - Performance monitoring
  - Regular reports
  - Others ________________

- Which function(s) do you use for your work most frequently?
  - Bokning
  - Order
  - Undervis
  - Others ________________

- How useful is the data in current reporting service to your business?
  - Important, essential for business decision
  - Useful, in general cases
  - Neutral/a little bit
  - Not very useful, keep it as archive
  - Not useful at all

- How often do you use S2 reporting service?
  - Never
  - Few times in total
  - Monthly
  - Weekly
  - Daily
  - Above 2 times per day

- Are you satisfied with current reporting service?
  - Very satisfied
  - Satisfied
  - Neutral
  - Not very satisfied
  - Dissatisfied

Your suggestions and expectations:

____________________________________________________________________

____________________________________________________________________

____________________________________________________________________
2. Contact Email

Dear xxx,

Thanks for your interest in the interview session of S2’s reporting service project. I am Pulan Li from China, the moderator of interview session.

For your reference, below is a brief description of interview outline. Thanks again and wait for your reply about possible interview schedule.

Sincerely yours,
Pulan Li

=====

Interview Outline:

1. Fill a background questionnaire: This questionnaire includes background information questions, e.g., your name, industry, the time and frequency you use S2CRM and its reporting service, etc.

2. Interview talk: Firstly, a short discussion on how you work with S2’s reporting service will be conducted. After that, several mockup pictures will be shown and your comments are expected. We will discuss regular report, SMS report and sales coaching report on different displays (e.g. PC screen, TV screen, mobile phone, etc.).

Should you have any inquiry and suggestion, please do not hesitate to contact me via plant.li.cuhk@gmail.com or 070 034 9784.
3. Interview Details

2012.09.27 Client interview: Bonnier Business Publishing

Interviewee: Charlotte Carlén
Occupation: Sales manager
Time: 2012.09.27, kl 10.00
Venue: Stockholm

*******************************

- Actual usage (Questionnaire)
  - Since when?
    Less than 1 year
  - Function/s of use?
    Booking, order
  - Frequency?
    Above 2 times per day (around 2 time one day)
  - Purpose?
    Sales coaching, performance monitoring, regular reports
  - Usefulness?
    Important, essential for business decision
  - Satisfaction?
    Not very satisfied
  - Suggestions and expectation?
    None

- Working pattern
  - Daily sales coaching: two times per day. Numbers are drawn on the white board for the whole group. Analysis and motivation are done during sales coaching.

- Feedback on Contents
  - Web-based report
    Individual performance and progress overview, dimension of period for comparison

}  
  - Outcome composition
Nej, ÅterkomPrio, Order is important data (why does their customer say yes/no?)
Comparison between different periods

- Outcome: time distribution
Fresh data needed, as a reference for daily schedule, e.g., what time to reach their customer, what time to plan group meeting/sales coaching.

- Outcome: top 5 salesman performance
Salesman’s outcome performances (total number, order number, order/total to see the efficiency)

- Sales performance overview
General sales performance/outcome statistics according to certain time scales, in line-chart form to show the performance of daily work.

- Salesman performance overview
Salesman’s order number, actual sales money (on a daily/monthly base since their salaries on these numbers)

- Individual report
Needed for sales coaching

- Product selling statistics
Order number of different handbooks

- TV Screen
Satisfied with topplistan with up-to-date data
Progress overview (whether they’ve reached the goal that has been set)

- SMS
Real-time SMS notification: confirmation sent to their clients once an order has been made. A link to their online system is preferred. Email notification is not highly preferred since there can be emails piled up in the mailbox.
SMS performance monitoring: preferably twice a day (lunch/end of day) in case of travelling.

- Tablet: Good to have
2012.09.27  Client interview: Topsell

Interviewee: Jean-Michael Löfdahl  
Occupation: Owner, CEO  
Time: 2012.09.28, kl 11.00  
Venue: Svarvargatan, Sandviken

******************************************************************************************************

• Actual usage (Questionnaire)

  - Since when?  
    Less than 1 year

  - Function/-s of use?  
    Order (Booking function will be launched soon)

  - Frequency?  
    Never used S2 reporting service before

  - Purpose?  
    Others (will use the charts to view visualized data)

  - Usefulness?  
    Not known yet

  - Satisfaction?  
    Neutral

  - Suggestions and expectation?  
    “I expect that the charts in real time will meet our needs to maximize and inspire our staff and sales.”

• Working pattern

  - Now only one project is running. 5 projects are about to be launched soon.
  - A separate contractor information system is running in parallel. There are some compatibility issues with S2CRM.
  - Sales coaching method: face-to-face talk, based on the outcome/sales performances, and the responses customers according to salesman.
  - Meetings: minor meetings (10.00, 13.00, 15.00 every working day), regular weekly meetings.
  - Data analysis: self-made Excel sheet from their own system.

• Feedback on Contents
- Web-based report
  target group: CEO, sales manager, salesman.
  Focus on individual performance
  The exported file sent to salesman needs to cover more detailed information,
  while sales managers are comfortable with top lists.
  Email with pdf file attached: a weekly/monthly delivery is preferred.

{  
- Outcome composition (including project basis)
  Order, Nej, Total number of calls
  Project outcome and total outcome can be put together. No Återkom/ÅterkomPrio.
  Details of responses in projects are also useful.
  Hierarchy of Återkom

- Outcome: time distribution
  Not very important

- Outcome: top 5 salesman performance
  Topplistan. Consider all the agents as well.
  Återkom/ÅterkomPrio as a reference of working efficiency with detailed tree
  information, showing performance of cold calls and re-calls. This information can
  be used to train salesman how to respond/talk to customers as well.

- Sales performance overview
  Xx

- Salesman performance overview
  Top list

- Product selling statistics
  Subscription management

}

- TV Screen
  List of top agents with their sales amount
  Real-time always-on service preferred.
  Goals and achievements (daily, weekly, monthly, in percentage view)

- SMS
Notification sent to customers (their customers have already asked for this service). Now they are sending email notification to their clients by themselves. They plan to use S2’s automatic email reply service in October.

- Tablet: Portability is welcome. Can be useful during traveling and meetings
2012.10.04 Client interview: Bokningsservice i Sverige

Interviewee: Christian Silfwersvärd
Occupation: CEO, owner
Time: 2012.10.04, kl 11.00
Venue: Stockholm, Sweden

(Email of sample pictures is sent)

- Actual usage (Questionnaire)
  - Since when?
    About two years
  - Function/-s of use?
    Booking
  - Frequency?
    Above 2 times per day (every hour for performance monitoring; every 5 minutes to check booking details, daily as a regular report)
  - Purpose?
    Performance monitoring, regular reports
  - Usefulness?
    Important, essential for business decision
  - Satisfaction?
    The customized function works well.
    The export function is complex and of low efficiency.
    The process of cancellation is of low efficiency. (Firstly he has to export the report with booking details, then check for the ID of specific user, type it into S2CRM and finally do the cancellation. The search function is relatively slow.)
  - Suggestions and expectation?
    Report sent to mobile/SMS; searching function improved; application on smartphone; statistics on TV screen; more information on personal sales performance

- Working pattern
  - Hierarchy:
    Client companies
      ▼ (Resources, available time schedules)
    Bokningsservice AB
↓ (Booking coaching, overall monitoring, quality management)
5 outsourcing telemarketing companies distributed among Sweden
↓ (Assignment, sales coaching)
Bookers
↓ (Booking, meeting procedure tracking)
Potential customers from PAR

- Monitor the performance of outsourcing companies.
- Tracking the whole process of meetings (booking – notification - modification – cancellation – ongoing meeting)
- Check contact information of customers to make sure all the real time information about active meetings reaches them.

• Feedback on Contents

- Web-based report
  As a manager, he wants to see a general picture of his outsourcing companies, e.g., their booking performances, their efficiency, and overall trend of booking quality. It is both for performance monitoring and budget estimation.
  He cares less about the individual bookers. The individual report only works when he wants to monitor new employees (for 1 – 3 days).
  He wants the data to be real-time produced for monitoring purpose.
  All the raw data (details of meetings and bookings) are essential for the manager since their main selling point is a guaranteed quality of booking.

{  
  - Booking overview
    He wants to see details of each meeting (mail address, phone number, and contact address) to monitor and directly take care of the quality of booking.
    For tracking bookings, data about # of bookings and # of cancellations will be interesting.

  - Booking: time distribution
    He wants the data of booking number to be shown in an hourly scale, for the sake of company’s business decision, e.g., planning their working schedule, conducting new weekend project, etc.

  - Progress Overview
    Interested. Target for tasks is meaning for booking coaching.

  - Sales performance overview
    the outsourcing company might have greater interest in sales coaching, but the problem is the customized functions should be delivered separately to each company instead of being shown to everyone since they are competitors.
- Individual report
  Not interested

- TV Screen: No interest
- SMS: No interest
- Tablet: No interest

- Potential BI functions of S2CRM:
  - Workforce scheduling: hourly pattern of booking number
  - New project reference: daily pattern of booking number
  - Performance monitoring in a long time scale
  - Budget estimation: booking distribution among 5 outsourcing companies.
2012.10.24 Client interview: Call-up

Interviewee: Johanna Bergström
Occupation: In charge of sales group management
Time: 2012.10.24, kl 13.00
Venue: Norra Slottsgatan, Gävle, Sweden

(Email of sample pictures is sent)

- Actual usage (Questionnaire)
  - Since when?
    More than 5 years.
  - Function/s of use?
    Order
  - Frequency?
    Above 2 times per day (refresh every hour to get the up-to-date data. 2 hours or more in total)
  - Purpose?
    Sales coaching, performance monitoring, regular reports
  - Usefulness?
    Important, essential for business decision
  - Satisfaction?
    Satisfied
  - Suggestions and expectation?
    Report sent to mobile/SMS; searching function improved; application on smartphone; statistics on TV screen; more information on personal sales performance

- Working pattern
  - From a bigger picture (group performance, project performance) to individual statistics.
  - Meeting
    Morning meetings with the whole group, no stats, general talk in 15 mins
    Group sales coaching according to yesterday’s results
    Private individual meetings with stats, for sales coaching
    Weekly meeting on Monday, summary of last week
Monthly meeting, summary of last month

- Comparison among all the sales man is important – works as a stimuli
- Both team work and individual work are equally important

• Feedback on Contents

- Web-based report
  Good to have always-on tabs since sometimes the table-based report can be very bulky as the project data increases and it will be difficult to read if the tabs are missing.
  Print function within-one-click

  {  
  - Outcome composition
    Dimensions: project performance (comparison within project, different time, since different project has different characteristics)

  - Outcome: time distribution
    High satisfaction, can be used to follow group working pattern
    Dimension: project performance according to different periods

  - Outcome: top 5 salesman performance
    Can be interesting if it is shown in a daily basis and monthly basis
    Can be very/less useful according to different projects

  - Sales performance overview
    Can be more useful if it is displayed according to different project separately
    Comparison among different periods
    Good to have progress overview (weekly/monthly)
    Good to have a more flexible feature

  - Salesman performance overview
    Already available on salesman’s interface
    Can be more interesting if this data can be shown on TV screen to the whole group

  - Individual report
    Self comparison (according to time), comparison with others

  }
- **TV Screen**
  Weekly/monthly goals (can be switched between different projects)
  Topplistan with up-to-date data

- **SMS**
  No SMS notification to customers right now. Only email notification is available.
  Good to have for aged customers.
  SMS to sales manager can be quite interesting. Used for performance monitoring.
  Concise information of performance is needed especially when sales manager is travelling.
  Good to have an Apps view as well.

- **Tablet**: Johanna doesn’t own a tablet right now.
C. Visual Studio Prototype Screenshots

1. Outcome Statistics

**Outcome Composition**

<table>
<thead>
<tr>
<th>Answer Type</th>
<th>Number of Answer</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order</td>
<td>120</td>
<td>0.44 %</td>
</tr>
<tr>
<td>Upptaget</td>
<td>351</td>
<td>1.30 %</td>
</tr>
<tr>
<td>Återkom</td>
<td>540</td>
<td>1.99 %</td>
</tr>
<tr>
<td>ÅterkomPrio</td>
<td>763</td>
<td>2.82 %</td>
</tr>
<tr>
<td>Fel</td>
<td>1478</td>
<td>5.46 %</td>
</tr>
<tr>
<td>Svärnad</td>
<td>1977</td>
<td>7.30 %</td>
</tr>
<tr>
<td>Nej</td>
<td>5971</td>
<td>22.04 %</td>
</tr>
<tr>
<td>Ej svar</td>
<td>15887</td>
<td>58.65 %</td>
</tr>
<tr>
<td>Grand Total</td>
<td>27087</td>
<td>100%</td>
</tr>
</tbody>
</table>

**Distribution by Time**

- **Daily Distribution, 2012-05-01 - 2012-05-31**

- **Hourly Distribution, 2012-05-30**

**Top Performance**

<table>
<thead>
<tr>
<th>Name</th>
<th>Order</th>
<th>Återkom Prio</th>
<th>Nej</th>
<th>Total</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>861</td>
<td>7</td>
<td>42</td>
<td>230</td>
<td>6171</td>
<td>11.34 %</td>
</tr>
<tr>
<td>813</td>
<td>5</td>
<td>118</td>
<td>399</td>
<td>3091</td>
<td>16.18 %</td>
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<tr>
<td>701</td>
<td>4</td>
<td>36</td>
<td>220</td>
<td>2109</td>
<td>18.97 %</td>
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<tr>
<td>849</td>
<td>4</td>
<td>31</td>
<td>270</td>
<td>4314</td>
<td>9.27 %</td>
</tr>
<tr>
<td>927</td>
<td>1</td>
<td>172</td>
<td>224</td>
<td>7218</td>
<td>1.39 %</td>
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</table>

2. Sales Dashboard
Sales Performance

Project: 201
Start from: 2012-05-01
End till: 2012-05-30

Overall Sales

Salesman Performance

<table>
<thead>
<tr>
<th>Name</th>
<th>Order Number</th>
<th>Sales Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>860</td>
<td>21</td>
<td>62028</td>
</tr>
<tr>
<td>967</td>
<td>22</td>
<td>50334</td>
</tr>
<tr>
<td>786</td>
<td>12</td>
<td>37546</td>
</tr>
<tr>
<td>969</td>
<td>10</td>
<td>28419</td>
</tr>
<tr>
<td>945</td>
<td>9</td>
<td>26841</td>
</tr>
</tbody>
</table>
3. Individual Dashboard

Prototype 1

Ryan Bertrand

Employee Nr.: 911  Work shift: 08:00 - 17:00
Address: Stamford Bridge, Fulham Road, London SW6 1HS, UK
Tel.: 0871 984 1958
Email: info@ctc.com

Sales Statistics

Sales per day: Month 8

Sales: Last 3 months

Order Details

<table>
<thead>
<tr>
<th>project ID</th>
<th>Order Time</th>
<th>Product</th>
<th>Order Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>201</td>
<td>2012-08-01 11:06</td>
<td>Ryan Bertrand</td>
<td>3000</td>
</tr>
<tr>
<td></td>
<td>2012-08-02 09:31</td>
<td>Ryan Bertrand</td>
<td>942</td>
</tr>
<tr>
<td></td>
<td>2012-08-08 10:53</td>
<td>Ryan Bertrand</td>
<td>3385</td>
</tr>
<tr>
<td></td>
<td>2012-08-09 11:05</td>
<td>Ryan Bertrand</td>
<td>1127</td>
</tr>
<tr>
<td></td>
<td>2012-08-13 08:41</td>
<td>Ryan Bertrand</td>
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<td>2012-08-13 16:23</td>
<td>Ryan Bertrand</td>
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</table>

| Project Total | 15224 |
| Grand Total   | 15224 |
Prototype 2

Claire Lind

Employee Nr: 059  Work shift: 08.00 - 17.00
Address: Bleafield Bridge, Fulham Road, London SW6 1HS, UK
Tel: 0871 906 1993
Email: info@dco.com

Sales Performance

Work Pattern

Outcome Distribution

<table>
<thead>
<tr>
<th>project ID</th>
<th>Ej order</th>
<th>Fell</th>
<th>Noj</th>
<th>Order</th>
<th>Sales Size</th>
<th>Uppsalg</th>
<th>Rest</th>
<th>Ateler</th>
<th>Number</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>201</td>
<td>304</td>
<td>5</td>
<td>13</td>
<td>28</td>
<td>13</td>
<td>71</td>
<td>51</td>
<td>541</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>304</td>
<td>5</td>
<td>13</td>
<td>28</td>
<td>13</td>
<td>71</td>
<td>51</td>
<td>541</td>
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Distribution by day

<table>
<thead>
<tr>
<th>Performance in last 3 months</th>
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</thead>
</table>

<table>
<thead>
<tr>
<th>Order Time</th>
<th>Project</th>
<th>Order Value</th>
<th>Order Value</th>
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<tbody>
<tr>
<td>201</td>
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<td>1575</td>
<td></td>
</tr>
<tr>
<td>201</td>
<td>10:29</td>
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<td></td>
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<tr>
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<td>10:36</td>
<td>4241</td>
<td></td>
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<tr>
<td>201</td>
<td>12:54</td>
<td>1575</td>
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<td>10:17</td>
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<tr>
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<td></td>
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<tr>
<td>201</td>
<td>12:10</td>
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</tbody>
</table>

Project Total: 79247
Grand Total: 79247

56