CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

Informatics

Department of Information Technologies

Diploma Thesis

CUSTOMER RELATIONSHIP MANAGEMENT

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Declaration

I declare that I have worked on my diploma thesis titled "Customer Relationship Management" by myself and I have used only the sources mentioned at the end of the thesis.

In Prague, 25.3.2012

.....

Bc. Michael Brabec

Acknowledgement

I would like to thank to Ing. Miloš Ulman, Ph.D. for his advices and supervise of my diploma thesis. Other thanks belongs to AIESEC for letting me working on their CRM system and thanks to that being able to develop information system which is used in real business. I want to also thank my tutors - doc. Ing. Vojtěch Merunka, Ph.D and Ing. Marek Pícka, Ph.D mainly for knowledge in object oriented programming and analysis with BORM.

Customer Relationship Management

Summary

Diploma thesis is focused on support of CRM in sales by information system. In literature overview is thesis focused on trends in development of CRM and also describes used methods for practical part. Author analyses in practical part current state of CRM system in selected organization and develops new solution.

Author does whole process by waterfall model methodology. In analytical part of development process author uses BORM methodology for describing processes during sales in mentioned organization.

Next step is user needs analysis by survey. Based on analysis was created concept by UML, documentation and wireframes. These materials are input for programmer and designer. Only this part of development process was not done by author of thesis.

Author describes process of verification when he tests beta version of new CRM system. He also evaluates education and feedback process. Based on feedback he suggests features for planned update.

CRM system supported sales and its productivity increased in compared periods by more than 70%. Author also evaluates other influences of this increment.

Keywords

CRM system, sales, business intelligence, customer care, account management, sales force automation

Customer Relationship Management

Souhrn

Diplomová práce se zabývá podporou CRM při prodeji za pomoci informačního systému. V literární rešerži se práce věnuje zejména trendům ve vývoji CRM a použitými metodami pro praktickou část.

V praktické části autor analyzuje současný CRM systém ve zvolené organizaci a navrhuje nové řešení. Autor popisuje celý proces vývoje podle metody vodopádového modelu.

V analytické části pracuje s metodikou BORM pro analýzu a popsání firemních procesů při prodeji. Dalším krokem je analýza požadavků současných uživatelů pomocí dotazníku. Na základě analýzy autor vytváří koncept pomocí UML, dokumentace a drátového modelu.

Tyto materiály jsou podkladem k naprogramování a tvorbě designu, které autor technicky nezaštiťuje. Autor popisuje proces verifikace, kde testuje beta verzi nového CRM systému. Popisuje i jeho výuku uživatelům a způsob jakým byla získávána zpětná vazba.

Autor navrhuje na základě těchto výstupů další návrhy na zlepšení.

CRM systém podpořil prodej a produktivita prodeje se zvýšila v porovnávaných obdobích o více než 70%. Autor zhodnocuje i jiné vlivy, které tomuto napomohly.

Klíčová slova

CRM systém, prodej, business intelligence, péče o zákazníky, account management, sales force automation

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1 Introduction

“Customer Relationship Management (CRM) is a business approach that integrates people, process, and technology to maximize relationships with customers. CRM increasingly leverages the Internet to provide seamless coordination among all customer-facing functions.” [4]

To know how to maximize businesses potential, company needs to know what their customers are thinking and what is their need. After all, if company feels that its customers must be satisfied because its profits are up; it may have more to do with a recent price rise as opposed to them actually buying any more products from mentioned company.

Vice versa in current market is great competition and unsatisfied customer can mean lost business opportunities with other potential customers.

Additionally, if senior sales man will leave the company - Is this going to affect a relationship with an existing customer? This is where good CRM comes into its own. If the result of a salesperson leaving means company is going to lose business from a particular client, company can in advance read all important communication and business with client and fit to the situation.

2 Objectives and Methodology

2.1 Objectives

The thesis is thematically focused on the issue of supporting Customer Relationship Management (CRM) by information systems. The main goal is to analyse the current state of software supporting CRM in selected company and propose improvements. Partial goals of the thesis are to write the literature overview of the topic, analyse the selected company's CRM software and propose new CRM software solution. Author analyses business process in sales of the selected company. In this thesis is described whole IS development process and induction of the system to selected company. This thesis evaluates improvement of productivity in sales department of selected company before and after using new CRM.

Can new CRM system improve productivity in sales department in selected company?

2.2 Methodology

Methodology of the thesis is based on study and analysis of specialized information resources. The practical part is focused on creating new concept of CRM for selected company. Based on a synthesis of theoretical knowledge and results of author's own work, the conclusions of the thesis will be formulated.

Author takes in consideration user needs and also satisfaction with current CRM by survey, personal consultation and empiric observation of the system. This thesis analyses business processes by BORM and creates conceptual model in UML. BORM analysis was created in CraftCASE software. Conceptual model was designed in StarUML. For simulation of simple version of CRM was created object oriented model in Daskalos.

During creation of wireframes for new CRM was used online service Mockflow. Testing of new CRM supported Mantis bug tracking system.

Statistical comparison was done in MS Excel based on data from new CRM.

Author was not responsible for programming and designing part of the development process.

3 Literature overview

It is important to understand CRM correctly. CRM could be understood as business process. This thesis is more focused on CRM as information system derived from this business process.

Customer Relationship Management (CRM) is a phrase that was started to use in the 90s of last century. Providing a concise definition of CRM is challenging due to its continuing rapid evolution, but here definition:

"Customer Relationship Management (CRM) is a business approach that integrates people, process, and technology to maximize relationships with customers. CRM increasingly leverages the Internet to provide seamless coordination among all customer-facing functions." [4]

Benefits of CRM could be derived into following sections:

- **Better sales/marketing information** - Customer names, customer background, customer needs, and competitive positioning are some of the data types collected as a result of implementing a CRM system.
- **Improved productivity** - Effectively targeting market identification, reducing the number of cold leads, providing accurate on-the-spot quotations, accessing inventory availability quickly, and entering orders directly from the field help to shorten the sales cycle.
- **Enhanced customer care** - More time is available to spend with customers due to a sales department's reduced administrative workload, an ability to monitor customer service levels, and the ability to highlight existing or potential customer service problems and react more quickly to customer needs.

CRM is an information industry term for methodologies, software and usually internet capabilities that help an enterprise manage customer relationships in an organized way.

CRM is the process of managing all aspects of interaction a company has with its customers, including sales and service. CRM applications attempt to provide insight into and improve the B2C relationship.

“CRM is an integrated approach to identifying, acquiring and retaining customers.” [1] By enabling organizations to manage and coordinate customer interactions across multiple channels, departments, lines of business and geographies, CRM helps organizations maximize the value of every customer interaction and drive superior corporate performance.

CRM is an integrated information system that is used to plan, schedule and control the pre-sales and post-sales activities in an organization. CRM is dealing with usage of prospects to customers, also call centre, sales force, marketing, technical support and field service.

“The primary goal of CRM is to improve long-term growth and profitability through a better understanding of customer behaviour.” [1]

CRM aims to provide more effective feedback and improved integration to better gauge the return of investment (ROI) in these areas. CRM is a business strategy that maximizes profitability, revenue and customer satisfaction by organizing around customer segments, fostering behaviour that satisfies customers and implementing customer centric processes.

3.1 Division of CRM

BUTTLER (2009) divides CRM into four types. Higher layer is dependent on lower layer. Collaboration type is influenced by all layers.

1. Operational
    - Focuses on the automation of customer-facing processes such as selling, marketing and customer service.
    - Operational CRM can contain sales force automation (SFA), marketing tools or customer service and support.
2. Analytical
    - CRM focuses on the intelligent mining of customer-related data for strategic or tactical purposes.

- Analytical layer contains data warehouse which can be analysed by data mining. Data are usually taken from daily use of operational layer + external analysis.

3. Strategic
    - Based on data from analytical part can manager generate trends and compare them with current state. Purpose of this layer is to support in decision making.
4. Collaborative
    - The purpose of collaboration is to improve the quality of customer service, increase customer satisfaction and loyalty.
    - For example, customer feedback gathered from a technical support session could inform marketing staff about products and services that might be of interest to the customer.

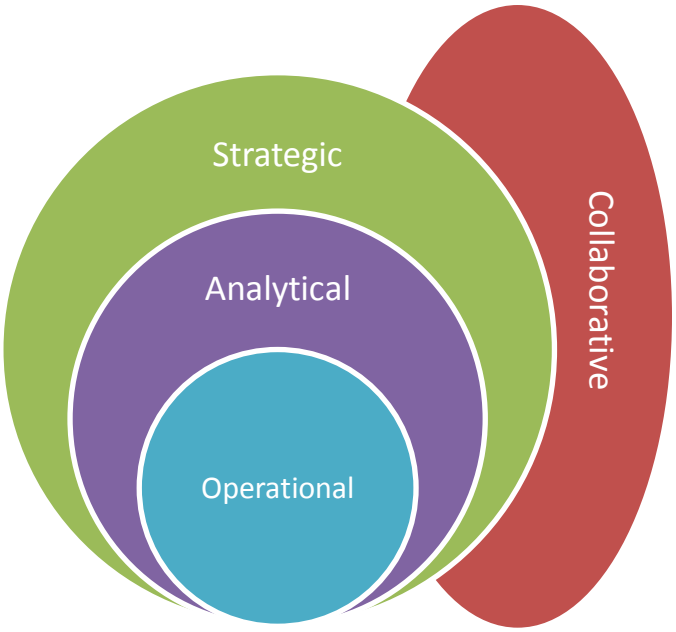


Figure 1: CRM types described by BUTTLER

3.2 Process of CRM creation (System Development Methodology)

There are many methodologies how to create information system. Generally those methodologies are described by cycles, because it is repeated process.

The basic and first system development cycle was Waterfall Model; this model will be described in this chapter. Waterfall Model has many limitations, due to this fact developers prefer more recursive system development cycles as for example Agile System Development.

But even modern and new system development methodologies are based on content of waterfall model, the difference is in flow.

Waterfall Model

"The waterfall model is a model which was developed for software development; that is to create software. It is called as such because the model develops systematically from one phase to other in a downward fashion, like a waterfall." [8]

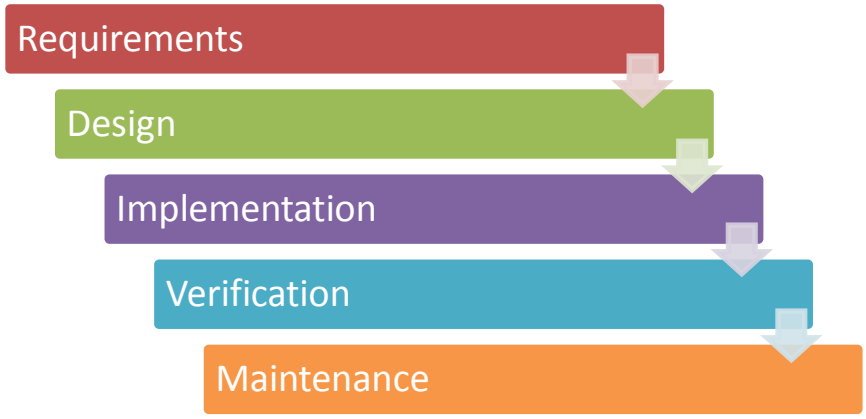


Figure 2: Waterfall Model [8]

Description of phases:

- Requirements – analytical part. Can contain feasibility study, analysis of needs, external reality or business processes. Brainstorming, objective and goals.
- Design – creation of documentation, database model, UML and materials needed for programmers, designers and so on.
- Implementation – coding + interface design
- Verification – testing of functionalities and correct behaviour of created system
- Maintenance - Maintenance is needed to ensure that the system will continue to perform as desired.

Advantages of Waterfall Model:

- Easy to understand – this model is transparent. Developer can easily orientate and plan milestones.
- Quicker engagement – sometimes happens that development team is changing. Thanks to documentation which is for WM important can new member of development team easier join the process. Newer methods are more dynamic and technically it is not possible to manage some extensive documentation as in WM.
- The Waterfall method is also well known amongst the software developers therefore it is easy to use. It is easier to develop some software through this method in short span of time.

Disadvantages of Waterfall Model:

- External factors – client is changing opinion during development, this is for WM not possible. It flows in one direction.
- Not cost effective – if something changes during development process, development must go from the start. This increases cost of development.
- Less cross-functional ideas – WM was created for division of tasks to exact department (project manager, system architect, programmer, designer, tester and so on). Due to this fact is less possible to find out innovations and give additional values to developed software. In newer methods was this problem overcame.

- Waiting delays – WM as it meant is not simultaneous. That means that one part of the process must be finished and after that can start next process. In modern methodologies is development more simultaneous, so it means in shorter period of time can be software finished
- Testing issue – Testing phase is firstly done almost in the end. Newer methods are more flexible. Programmers create some part and it can be immediately tested. This can provide much quicker feedback to programmers and they can build high quality system with no mistakes.
- Elaborate documentation during the Waterfall method has its advantages, but it is not without the disadvantages as well. It takes a lot of effort and time, which is why it is not suitable for smaller projects. [8]

3.3 Business Intelligence

Business intelligence (BI) is a broad category of applications and technologies for gathering, storing, analysing, and providing access to data to help enterprise users make better business decisions.

BI applications include the activities of

- decision support systems,
- query and reporting,
- online analytical processing,
- statistical analysis,
- forecasting and data mining.

“This type of analytic application provides CRM solutions with the following three key capabilities:

- The ability to quantity the value of the customer contact
- The ability to set thresholds to trigger rules and events (automate delivery of specific content such as personalized offers and product recommendations)
- The ability to help qualify customer information” [4]

A data warehouse is a large analytical database that can serve as the foundation for BI activities. Data warehousing is a process supported by several underlying enabling technologies, such as data extraction, transformation, and load tools, that is built on popular database engines including that support OLAP (Online Analytical Processing) technology.

Data mining can best be described as a BI technology that has various techniques to extract comprehensible, hidden, and useful information from a data population. Data mining makes it possible to discover hidden trends and patterns in large amounts of data.

3.4 Sales force automation

"Sales-force automation (SFA) was the original form of operational CRM. SFA systems are now widely adopted in business-to-business environments." [1]

SFA applies technology to the management of a company's selling activities. The selling process can be decomposed into a number of stages, such as lead generation, lead qualification, needs identification, development of specifications, proposal generation, proposal presentation, handling objections and closing the sale.

SFA software can be configured so that it is modelled on the selling process of any industry or organization. Automation of selling activities is often linked to efforts to improve and standardize the selling process. This involves the implementation of a sales methodology. Sales methodologies allow sales team members and management to adopt a standardized view of the sales cycle and a commons language for discussion of sales issues.

Sales-force automation software enables companies automatically to assign leads and track opportunities as they progress through the sales pipeline towards closure. Opportunity management lets users identify and progress opportunities to sell from lead status through to closure and beyond, into after-sales support. Opportunity management software usually contains lead management and sales forecasting applications. Lead management applications enable users to qualify leads and assign them to the appropriate salesperson.

Sales forecasting functionality generally use transactional histories and salesperson estimates to produce estimates of future sales. Contact management lets users manage their

communications programme with customers. Computerized customer records contain customer contact histories.

Contact management applications often have features such as automatic customer dialling, the salesperson's personal calendar and e-mail functionality. Quotation and proposal generation allow the salesperson to automate the production of prices and proposals for customers. The salesperson enters details such as product codes, volumes, customer name and delivery requirements, and the software automatically generates a priced quotation. Product configuration applications enable salespeople, or the customers themselves, automatically to design and price customized products, services or solutions to problems. [1]

3.5 Social CRM

"Social CRM is s philosophy and a business strategy, supported by a technology platform, business rules, processes, and social characteristics, designed to engage the customer in collaborative conversation in order to provide mutually beneficial value in a trusted and transparent business environment. It's the company's response to customer's ownership of the conversation." [2]

3.6 Cloud Computing

Cloud computing solutions are really popular and not even in corporate sector, but also in services for public. Every user of Facebook, Google Docs, Dropbox and other popular services is using cloud. Cloud computing started big boom in past years and services which are not even paid are used by millions of users.

Cloud computing works on principle that user is not connected to company based server, but on server hosted by provider of some application. Client connects via internet to online service. Thanks to modern technologies as HTML 5, Java and others; is more and more popular to use web based information systems.

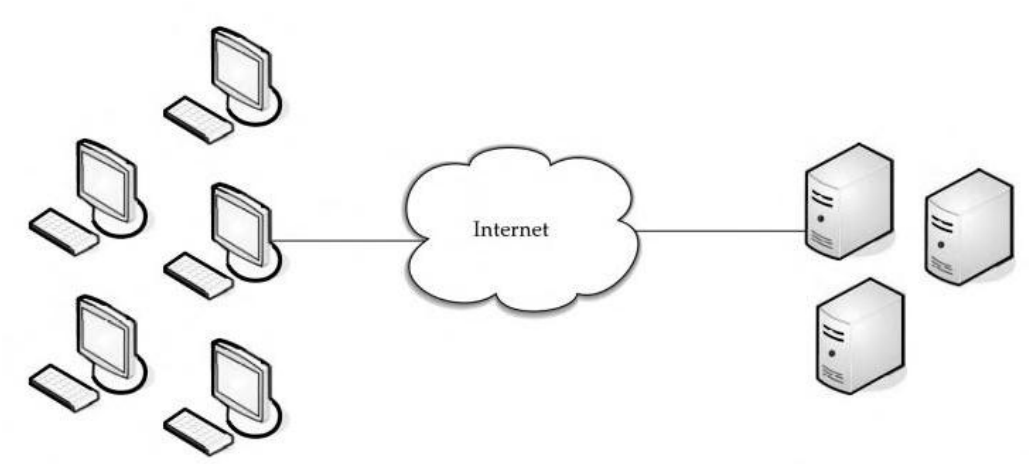


Figure 3: Diagram of cloud computing [3]

A thin client is a computer or a computer program which depends heavily on some other computer (its server) to fulfil its traditional computational roles.

Advantages of cloud computing:

- Lower hardware costs - Thin clients are cheaper than thick clients because they do not contain as much hardware. They also last longer before they need to be upgraded or become obsolete.
- Lower IT costs - Thin clients are managed at the server and there are fewer points of failure.
- Security - Since the processing takes place on the server and there is no hard drive, there's less chance of malware invading the device. Also, since thin clients don't work without a server, there's less chance of them being physically stolen.
- Data security - Since data is stored on the server, there's less chance for data to be lost if the client computer crashes or is stolen.
- Less power consumption - Thin clients consume less power than thick clients. This means you'll pay less to power them, and you'll also pay less to air-condition the office.
- Ease of repair or replacement - If a thin client dies, it's easy to replace. The box is simply swapped out and the user's desktop return exactly as it was before the failure.
- Less noise - Without a spinning hard drive, less heat is generated and quieter fans can be used on the thin client. [3]

The biggest disadvantage is reliability on internet connection. In case there is none (or weak) connection and no synchronization with thin client cannot user of this service work. Same case can happen on side of provider.

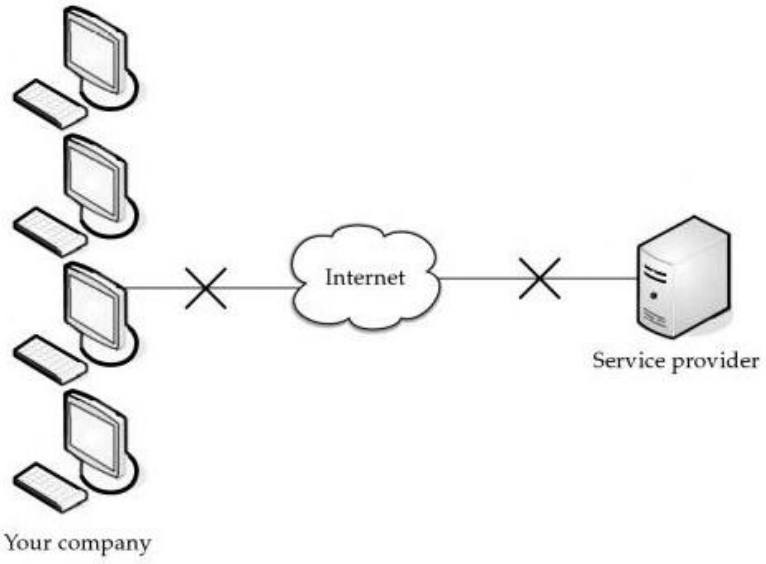


Figure 4: Disadvantage of cloud computing [3]

3.7 Difference between CRM and ERP

Information for this part was researched in following source (PEEL 2002).

ERP stands for Enterprise Resource Planning, and it is complex (much more than CRM) software that streamlines internal functions in company. This tool allows managing for example human resources, accounting, administration and production.

ERP is managing partly accounts and data of clients, so some functions of ERP are overlapping functions of CRM.

Solutions are:

- To integrate CRM to ERP
- To use only modules of ERP
- To share database of ERP with external CRM

3.8 CRM software overview

It will be made comparison of paid and open source CRM systems in this part.

Paid CRM comparison was based on CRM software Review 2012 available on website http://crm-software-review.toptenreviews.com/ [6]

Paid software comparison (ordered by ratio)

1. **Salesforce** - This CRM software, developed by Salesforce.com. Benefit is simplicity of the design and the depth of the tools that were made available to user by using this CRM software.

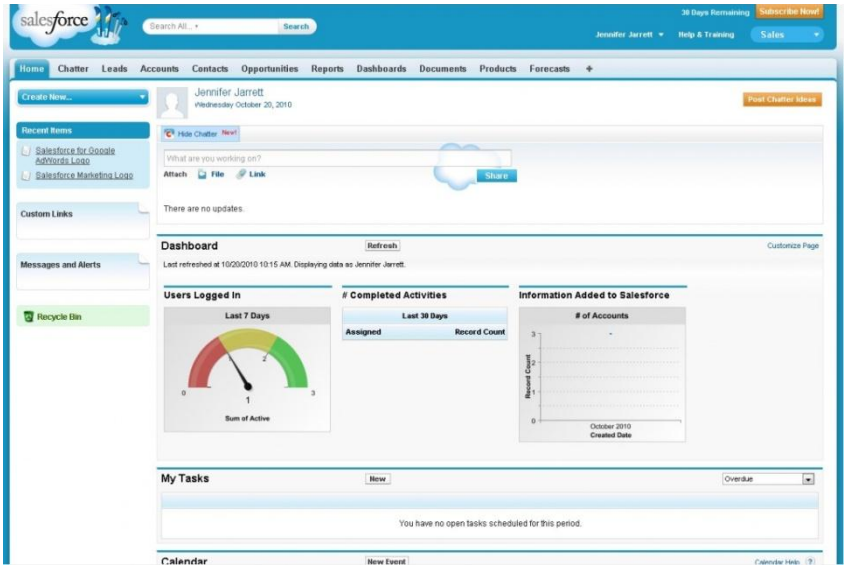


Figure 5: Screenshot - Salesforce.com (http://crm-software-review.toptenreviews.com/)

2. **Oncontact** provides a split-window view. This view splits the window of the CRM software in half with a toolbar running horizontally through the centre. This split makes it possible to pull up a company or customer and view their name, status and contact information on the top of the screen and view the in-depth details on the bottom.
3. **Sage ACT!** allows to integrate user's email with the application, so user can open and manage all of her/his messages from within the CRM software. In addition to the email integration, no customer relationship management software is complete without

calendar integration abilities. Keeping track of meetings, phone calls and daily activities is all an important aspect of managing and keeping customer relationships strong. As a business contact manager, ACT! also provides the ability for you to make a running to-do list. This business CRM application comes as a web-hosted application or as an on-premise solution. The web hosted application can be accessed anywhere with mobile capabilities.

Open source comparison [7]

1. **SugarCRM** Inc. was founded in 2004 by John Roberts, Clint Oram and Jacob Taylor, the Sugar open-source code has been downloaded more than 3 million times. The company has received $26 million in venture financing and employs more than 100 people. More than 12,000 companies use SugarCRM including Honeywell International, Starbucks Corp., First Federal Bank and BDO Seidman LLP. SugarCRM is written in PHP and is compatible with the MySQL database.

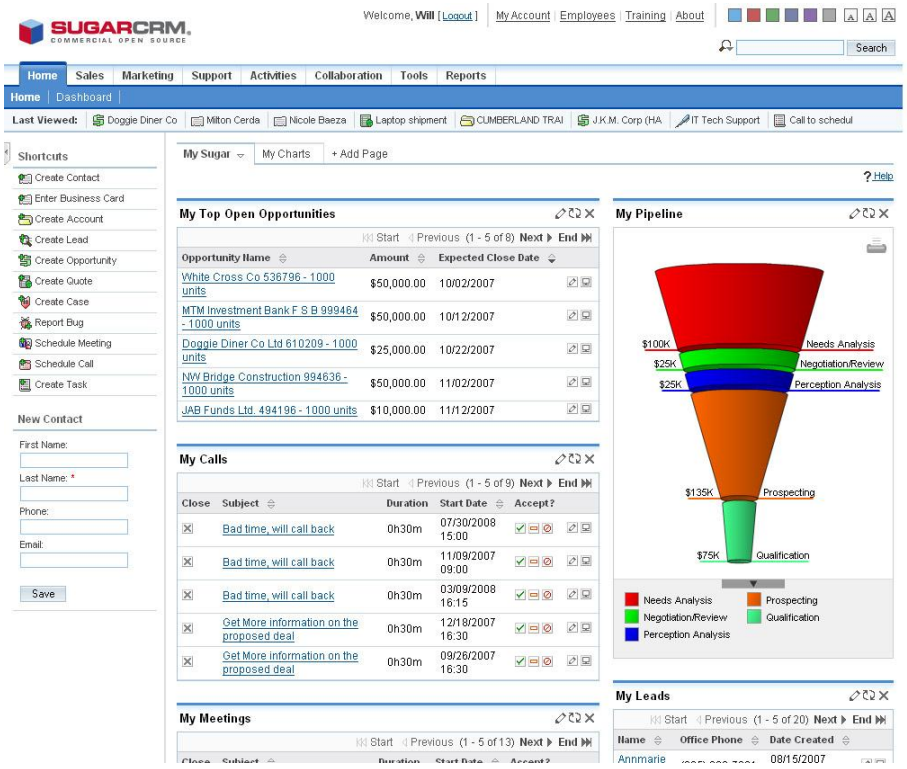


Figure 6: Screenshot SugarCRM (http://www.sugarcrm.com)

2. **SplendidCRM** Software Inc.'s development team formed in November 2005. The application is built on the Microsoft platform (Windows, ISS, SQL Server, C# and ASP). Designed for system integrators, SplendidCRM allows administrators to add user-customizable features such as .NET 2.0's Themes, Web Parts and AJAX. SplendidCRM is positioned as a competitor to SugarCRM, as the two applications share many of the same features. For instance, both offer an Outlook plug-in and the ability to add custom fields.
3. **CentricCRM** has been around for seven years and has achieved a great deal of stability and robustness. In June 2007, CentricCRM (renamed Concursive as of December 2007) received investment funding from Intel Capital, the venture capital arm of Intel Corp. CentricCRM is aimed at the small-business market, although it has scaled up within Fortune 500 companies. Its more complex features can be turned off if they are not needed, and the administrative console allows for a great deal of customization. The free version comes with five user licenses. Centric CRM is written in Java and is compatible with MySQL databases.

3.9 UML

"The Unified Modeling Language is a notation; that is a set of diagrams and diagram elements that may be arranged to describe the design of a software system. UML is not a process, nor is it a method comprising a notation and a process." [9]

This modelling language is used for modelling software system, it helps to all people participating in system (designer, programmer, project manager, server admin, IT consultant and even client if needed) creation to understand fully the content, processes and characteristics of system.

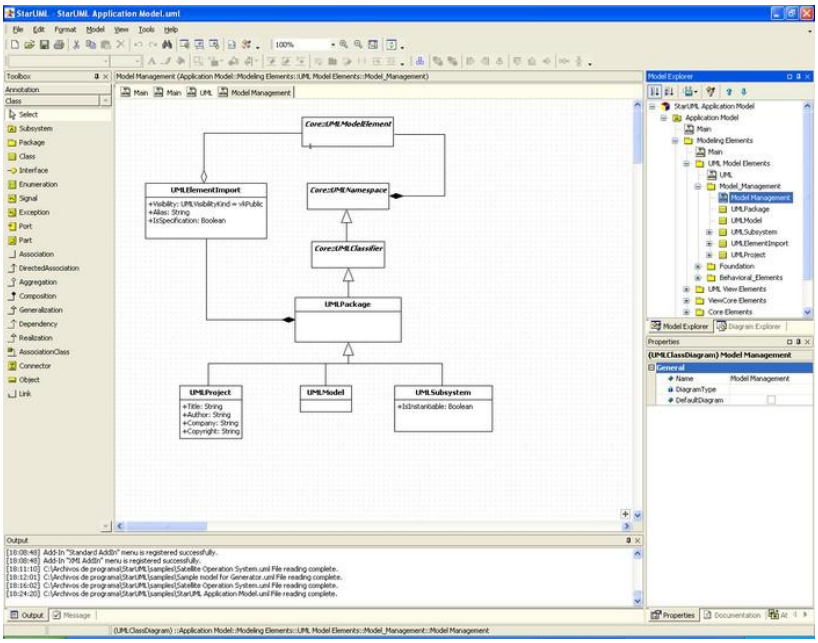


Figure 7: UML editor StarUML (2011)

In the UML are recognized two main categories of diagrams - Static and Dynamic. Static models are not influenced by time flow.

Static diagrams category contains:

- ***Class diagram*** describes the structure of a system by classes. Classes contain attributes, and there are relationships among the classes.
- ***Component diagram*** describes how a software system is split up into components and shows the dependencies among these components.
- ***Composite structure diagram*** describes the internal structure of a class and the collaborations that this structure makes possible.
- ***Deployment diagram*** describes the hardware used in system implementations and the execution environments and artefacts deployed on the hardware.
- ***Object diagram*** shows a complete or partial view of the structure of an example modelled system at a specific time.
- ***Package diagram*** describes how a system is split up into logical groupings by showing the dependencies among these groupings.

Dynamic diagrams category contains:

- ***Activity diagram*** describes the business and operational step-by-step workflows of components in a system. An activity diagram shows the overall flow of control.
- ***State machine diagram*** describes the states and state transitions of the system.
- ***Use case diagram*** describes the functionality provided by a system in terms of actors, their goals represented as use cases, and any dependencies among those use cases.
- ***Communication diagram*** shows the interactions between objects or parts in terms of sequenced messages. They represent a combination of information taken from Class, Sequence, and Use Case Diagrams describing both the static structure and dynamic behaviour of a system.
- ***Interaction overview diagram*** provides an overview in which the nodes represent communication diagrams.
- ***Sequence diagram*** shows how objects communicate with each other in terms of a sequence of messages. Also indicates the lifespans of objects relative to those messages.

3.10 BORM

BORM is shortcut for term Business Object Relation Modelling. This method was developed in 90s of the last century. It uses MDA principle.

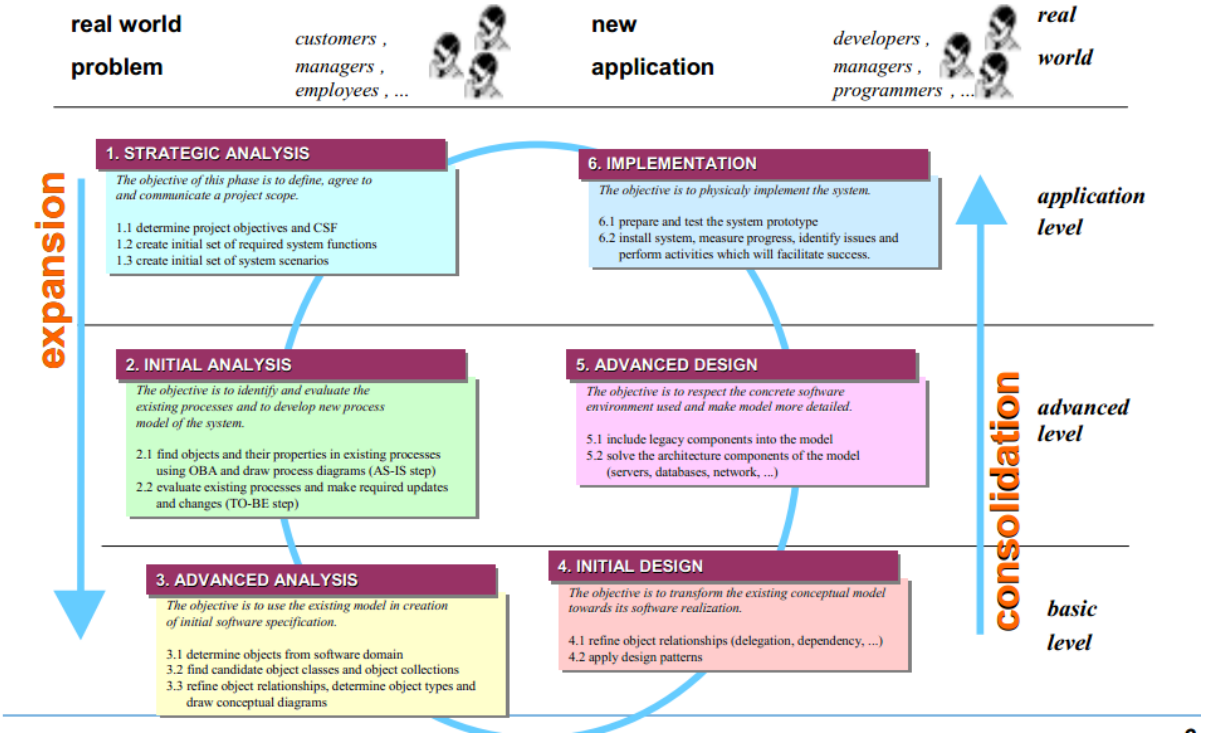


Figure 8: BORM Spiral Development Life Cycle [10]

MDA (Model Driven Architecture) defines an approach that separates a specification of business system description from its computer implementation specification and this computer specification from the final solution. Each specification represents an individual viewpoint of the same problem. According to MDA, there is a mutual relationship between these three views, and the models should transform from one to another when a system is created. [10]

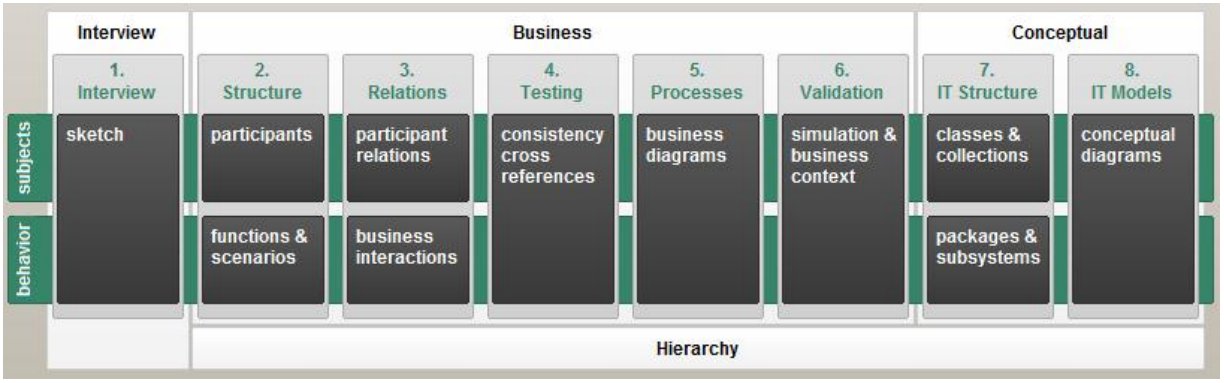


Figure 9: BORM method structure (source: CraftCASE software, 2012)

Description of each part:

- Interview
    - Sketch – this part is for creation first drafts of communication principles, relations, processes, subjects and so on.
- Structure
    - Participants – defines objects which are participating in analysed process
    - Functions and scenarios – defines functions which are involving participants. Defines scenarios of possible processes.
- Relations – defines relations between participants or showing interactions in processes
- Testing - During model testing, an analyst should get help from project clients and experts. This assures that the model corresponds to reality, and that it fulfils the task for which it is created.
- Processes
    - Business diagrams – this part is essence of whole BORM. One diagram is describing one scenario. Diagram contains participants, actions, states, communications, conditions and data flows between them. Thanks to this tool is whole process clear and understandable and contains all needed inputs for software implementation part.
- Validation
    - Simulations – i.e. CraftCASE application enables testing of business diagram validity. It is needed to keep correct logic of recorded process.
- Conceptual – in this part is created conceptual diagram which could be used for creation of object oriented database. (see Figure 10, page 33)

3.11 Modern research in CRM

„Customer is the foundation of the survival and development of commercial banks. This forces domestic commercial banks need to establish a perfect customer value analysis and evaluation system to enhance the customer value analysis. This article establishes a scientific and reasonable evaluation system of corporate client lifetime value of commercial banks on the basis of previous research. Then we get a scientific structural equation model of customer lifetime value by using the analysis of software SPSS13.0 and AMOS17.0. The structural equation model of customer lifetime value enrich the field of customer lifetime value and provide basis for customer relationship management and customer classification of commercial banks. It makes the commercial bank's customer relationship management more scientific and reasonable." [12]

"Purpose - An overarching objective of this article is to provide academics and practitioners working with customer relationship management (CRM) with a review of key topics such as advances in CRM, the shifting role of consumers, issues with conceptualisation and consumer exploitation. We further integrate concepts of fairness, trust and paradoxes of one-to-one marketing which are little researched within customer management. As a result, we suggest 8 propositions for improving the CRM scheme.

Design/methodology/approach - This paper reviews extant literatures in customer relationship management (CRM) with a particular emphasis on the pitfalls of CRM.

Findings - We find that the risks of depleting customer trust as they perceive themselves being exploited by firm's CRM offerings should be openly discussed as it pose a significant threat to the CRM scheme if it is overly used and misused.

Practical implications - It is proposed that the concept of dual value-creation and win-win relationships are fundamental to successful implementation. However, the danger of implementing CRM in such a way as to lead customers to believe that they are worse off requires more research. Managers must therefore define their CRM, understand their pitfalls and look at where their CRM is headed.

Originality/value - Eight propositions are made about CRM's successes, advances, pitfalls and futures. A focus is on the fairness of CRM and a new definition is offered." [11]

"Scoring models yield continuous predictions instead of sharp classifications. Scoring customers for profitability, loyalty, or product affinity corresponds to an inductive fuzzy classification: The model represents a continuous membership function mapping the set of customers into the fuzzy set of interesting customers – the fuzzy target group. This chapter presents a method for membership function induction based on normalized likelihood ratios. Applications of this method are proposed for selection, visualization, and prediction in the field of analytics in general, and for customer profiling, target group definition and customer scoring specifically for analytic customer relationship management. A real world case study is described. Furthermore, an implementation of the proposed method, developed at the research center for fuzzy marketing methods (FMsquare1), is presented. "[13]

"Achieving excellence in Customer Relationship Management (CRM) is a cornerstone objective in the transformative efforts of the Ministry of Health and Long-Term Care and its Health System Information Management and Investment (HSIMI) division. The implementation of the HSIMI division CRM solution is expected to enable increased control and accountability for the division's services, and improved external and internal customer satisfaction. Find out what lessons the project team learned and success factors that facilitated the implementation of this information system." [14]

"There are few comprehensive studies and categorization schemes to discuss the characteristics for both data mining and customer relationship management (CRM) although they have already become more important recently. Using a bibliometric approach, this paper analyzes data mining and CRM research trends from 1989 to 2009 by locating headings "data mining" and "customer relationship management" or "CRM" in topics in the SSCI database. The bibliometric analytical technique was used to examine these two topics in SSCI journals from 1989 to 2009, we found 1181 articles with data mining and 1145 articles with CRM. This paper implemented and classified data mining and CRM articles using the following eight categories—publication year, citation, country/territory, document type, institute name, language, source title and subject area—for different distribution status in order to explore the

differences and how data mining and CRM technologies have developed in this period and to analyze data mining and CRM technology tendencies under the above result. Also, the paper performs the K–S test to check whether the analysis follows Lotka's law. The research findings can be extended to investigate author productivity by analyzing variables such as chronological and academic age, number and frequency of previous publications, access to research grants, job status, etc. In such a way characteristics of high, medium and low publishing activity of authors can be identified. Besides, these findings will also help to judge scientific research trends and understand the scale of development of research in data mining and CRM through comparing the increases of the article author. Based on the above information, governments and enterprises may infer collective tendencies and demands for scientific researcher in data mining and CRM to formulate appropriate training strategies and policies in the future. This analysis provides a roadmap for future research, abstracts technology trends and facilitates knowledge accumulations so that data mining and CRM researchers can save some time since core knowledge will be concentrated in core categories. This implies that the phenomenon "success breeds success" is more common in higher quality publications." [15]

4 Practical part: Improving CRM for selected organization

This case study is focusing on creation of new CRM system for AIESEC Czech Republic. The system is built on demand for this organization. This organization has previous CRM system, but because of several reasons AIESEC decided to create new system. This case study is analysing old CRM and potential for improvement, definition of concept for new CRM and process of implementation. Last part is analysis of productivity. It means to derive ratio between season when was used old CRM and season of new CRM.

This process happened in 2010 and author of this thesis was responsible for creating concept of the new CRM, communication with company who programmed it, testing, educating it and creating upgrades.

CRM in AIESEC Czech Republic is purely for sellers to record communication between company/organization/institution and AIESEC.

Problem of student organizations is in often membership changes. Members are leaving in the best case after 5 years, but average is 1.5 year. Due to this is CRM system needed.

For example: Some company started to cooperate in the beginning of 2007. Cooperation was successful and in the end of 2007 company took 5 international students to IT department for programming some software. Unfortunately member who was managing this cooperation left in 2010. His successor knew that there was some cooperation, but not exactly what kind of cooperation, who to speak with and so on. Thanks to CRM all these data are stored.

CRM for AIESEC don't need to calculate profit or costs, this part is done externally by budgeting and accounting.

4.1. Selected organization - AIESEC

AIESEC is the biggest youth organization in the world. In AIESEC is participating over 2100 universities in 110 countries with more than 60 000 students. AIESEC was established after war in 1948 by university students, one of the 7 students was from Czechoslovakia. One of the focuses in this organization is to offer opportunity to discover different cultures to increase

global awareness of young people. AIESEC realized in 2011 over 16 000 international internships. Statistics were taken from global information system MyAIESEC.net.

Important value for this organization is also personal development of young people. AIESEC organizes conferences, workshops, trainings and members of AIESEC are simulating business processes during their studies on university. This organization also helps students to cooperate with corporate sphere. AIESEC offers to learn how to work in teams and to lead people.

AIESEC Czech Republic has 9 local chapters on following universities

- Czech University of Life Sciences in Prague
- University of Economics in Prague
- Mendel University in Brno
- Technical University of Ostrava
- University of West Bohemia (in Pilsen)
- Palacký University Olomouc
- Tomas Bata University in Zlin
- University of Hradec Kralove
- Silesia University in Opava (in Karvina)

Headquarter of AIESEC Czech Republic is also in Prague. AIESEC CZ has more than 500 members working or leading more than 40 teams. These teams are realizing projects or supporting processes in local chapter. Thanks to this have students to try team work and leadership opportunities.

4.2 New CRM creation process

Described process is based on author's experience and mentioned tools as Waterfall model.

Process of creation was following:

1. Creation of concept (this process is described deeper in this chapter)
2. Choosing company (who will implement concept)
3. Signing contract
4. Analysis of old CRM's database (how is its structure?)
5. Wireframe
6. Design
7. Programming the functionalities
8. Migration of old CRM's database
9. Testing + Repairs
10. Release
11. Testing + Repairs
12. Education for users
13. Feedback from users
14. Upgrades – creating concept for phase 2

4.3 Analysis of current state

This current state is from 2010. Current CRM was created in 2003 by company ET Netera and upgraded in 2007.

Main disadvantages of this system are:

- Only Company ET Netera owns the code
- CRM is slow (because of bad optimization and server)
    - Sometimes one operation took over one minute. Users stopped using it, because only writing communication to CRM slowed down their productivity.
- Database is not optimized

    - This fact was proved by analysis during creation of new CRM by programmers, who had to move data from old system.
- It is expensive to upgrade and improve system
- Users of CRM are not using system, because they perceive it as bureaucracy
    - Here is needed to create some motivation for users to use it.

This CRM has also many useful functions which are:

- Create/Edit/View local chapter
    - Czech Republic is relatively small country and density of companies in cities is high. Due to clear communication with companies must be company assigned to exact local chapter.
    - It is not allowed to contact that company with permission of local chapter. Division of local chapter in system is also needed for generating statistics, because those statistics can be used for competitions and analyses of productivity and trends in exact cities.
- Create/Edit/View team
    - In this organization are people working in teams. Each team has name and leader. Leader has rights to edit companies of members of his/her members and control their work.
- Create/Edit/View user
    - Each user is assigned under team in some local chapter. Login name is email and this login process is protected by password.
- Create/Edit/View/Searching company
    - Company is containing basic information about the company. Searching companies by ID, name, local chapter, and team is important.
- Create/Edit/View contact person for company
    - Before user records communication he/she needs to assign communication under some contact person of company. This contact person has attributes as job position, number, e-mail and notes. User can write some impressions about the person to notes.

- Create/Edit/View communication
    - The most important function of this CRM. Enables to create communication between user and company. Communications types which can user select are call, meeting, contract, account management task. Thanks to division of communication is possible to track how many calls leads to meeting or how many meetings are leading to contract. Account management task is for keeping good customer care. Every communication has time and date.
- Task list
    - Task list is generated according to communication. User can plan his future communication. For example user calls to company and company agrees on meeting. User creates new record and set time and date of that meeting. This record is automatically visible in tasks. Tasks which are expired (after set date) are coloured red as warning that something is not right.
- Generate statistics
    - This function can be scaled by local chapters, team and even users. First case can generate which local chapter is performing the best in selected period. Time to time is opened competition between local chapters based on statics from CRM. This is also one form of motivation for using this system.
- Documents storage
    - Ability to upload and download contracts, reports, forms, proposals and so on.

These functions were basics for the concept of new CRM.

4.4 Concept of improvement

Described process is based on author's experience and according to Waterfall model.

The concept creation flow:

1. Analysis of previous CRM
2. Analysis of users' needs
3. Analysis of business process
4. Creating objectives of new CRM

5. Creating list and description of functions
6. Feedback from potential users
7. Discussing price with developers
8. Reducing less important function to fit in budget (postponing to the other phases)
9. Finalizing concept

4.5 Analysis of users' needs

During creation of concept for new software is needed to do analysis from the users. Author of this thesis asked leaders of functional areas which are using CRM to understand which functions they need. This analysis is important, because satisfaction of users is essential. There were a lot of wishes on functionalities, but it was needed to prioritize and choose the possibly most used ones.

Concept was divided in more phases. Goal of Phase One was to build basic functions which are necessary for sellers. This case study is focused mainly on phase one.

Survey contained these questions:

1. What is your local entity? (select box)
2. What is your position? (select box)
3. What are the most used functions by you in CRM? (text area)
4. What function do you need for you work? (text area)
5. What is your expectation about new CRM? (text area)

This survey was distributed to 30 people oriented in sales. 26 of them replied. Purpose of the survey was more focused as brainstorming for new functionalities.

Output is summarized in subchapter 4.8 and 4.9.

4.6 Analysis of business process – UML

Conceptual model simulates this business process of communication between salesman and contact person. Conceptual model was designed in StarUML.

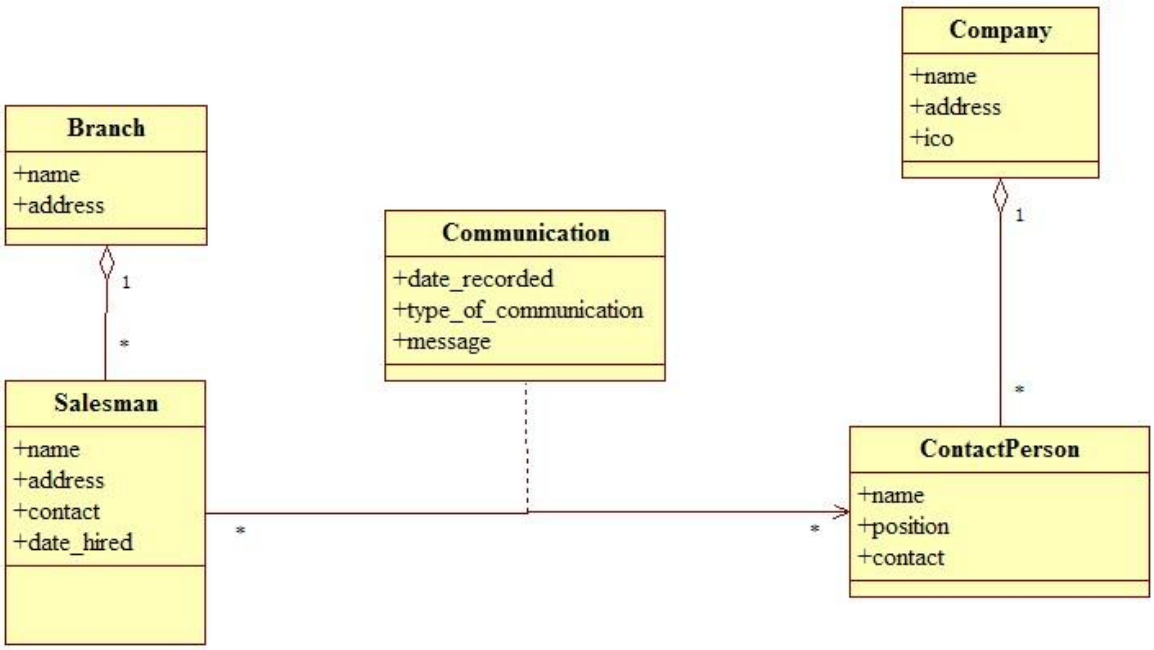


Figure 10: Conceptual model (source: author, 2011)

Class Communication is association class which exists because of process of communication between salesman and contact person.

Left side represents our people, right side represents people from company we want to have business with.

Associations:

1. Salesman is in branch – Aggregation
2. Contact person is in company – Aggregation
3. Salesman communicates with contact person, but contact person is not communicating with salesman. (this is established because physically in system is salesman always recording communication, contact person is not responsible for this process) – Directed Association

Multiplicity:

1. 0 to infinite salesmen can be only in one branch
2. 0 to infinite salesmen can communicate with 0 to infinite contact persons
3. Company can have unlimited number of contact persons

Object oriented database model in Daskalos

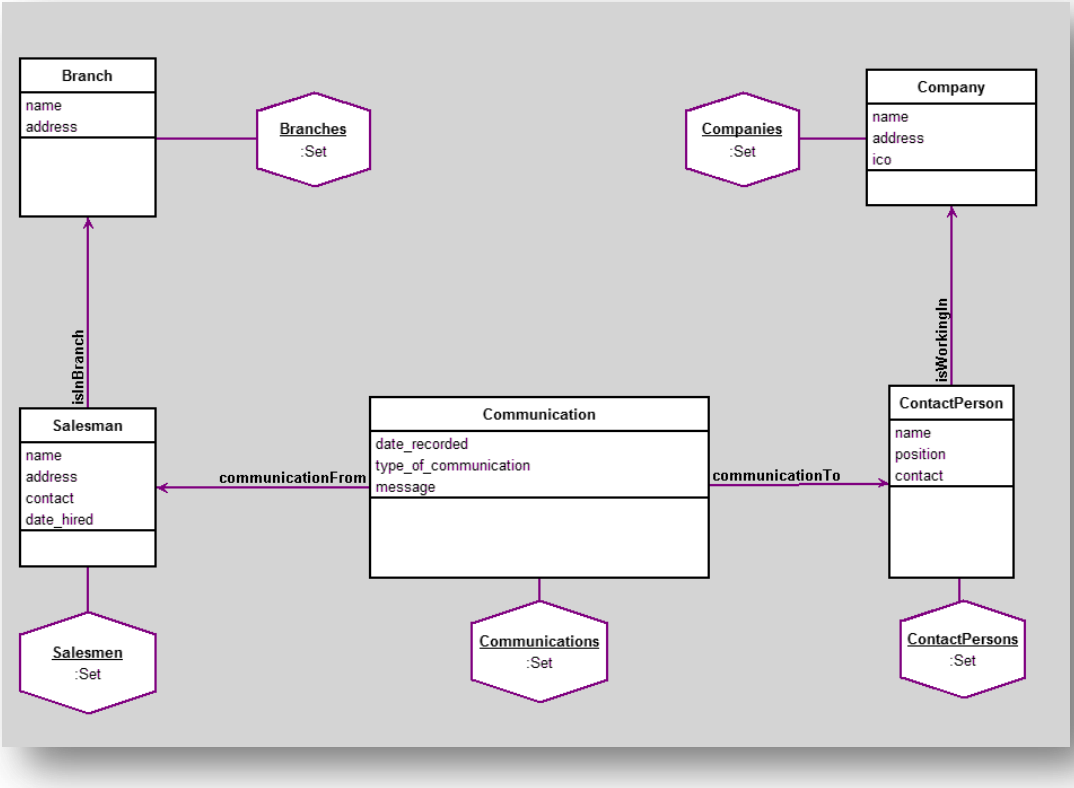


Figure 11: OODB model in Daskalos (source: author, 2011)

Description of objects

- Branch – it represents local chapter where is salesman (alias seller) working
- Salesman – is person who is establishing cooperation between his/her branch and company
- Company – is company/institution/organization which is represented by company ID, address and name
- Contact Person – this person is employed in company. It is person who is communicating with salesman
- Communication – is record of communication between salesman and contact person

4.7 Analysis of business process – BORM

Following models are created as Business Diagram in BORM methodology. These diagrams were created with CraftCASE software.

In all three diagrams are representing these subjects:

- Seller – is the person who wants to close the deal with the company
- Company – is the company which is represented by decision maker (person who can decide about business)
- CRM – is internal system used for recording, viewing and analysing communication

The first diagram (see Figure 12) is representing whole selling process. Seller's goal is to firstly call to company, which can be interrupted by answering machine or incompetent person who can't decide about business. Then seller starts to offering meeting, company can decide positively or negatively about that.

- In negative case is seller recording the call to the CRM and decides if there is possibility to try to call again in future. If yes, whole process is repeating from the beginning. If not, seller is closing communication with this company.
- In positive case the process is continuing. Seller is going to meeting

On meeting is discussed possible cooperation. Company decides positively or negatively for cooperation. In negative cooperation is situation analogical as in previous conditions. In

positive decision is company deciding on cooperation condition. Seller can agree or disagree with those conditions. Output of the meeting is recorded in negative or positive decision.

If both sides agree on cooperation then they arrange contract meeting. This meeting is for signing the contract.

Future steps which are not mentioned in diagram is signing contract, uploading it on CRM and account management with company. Signing contract is described in Figure 14 (page 39).

Calling process is more described in Figure 13.

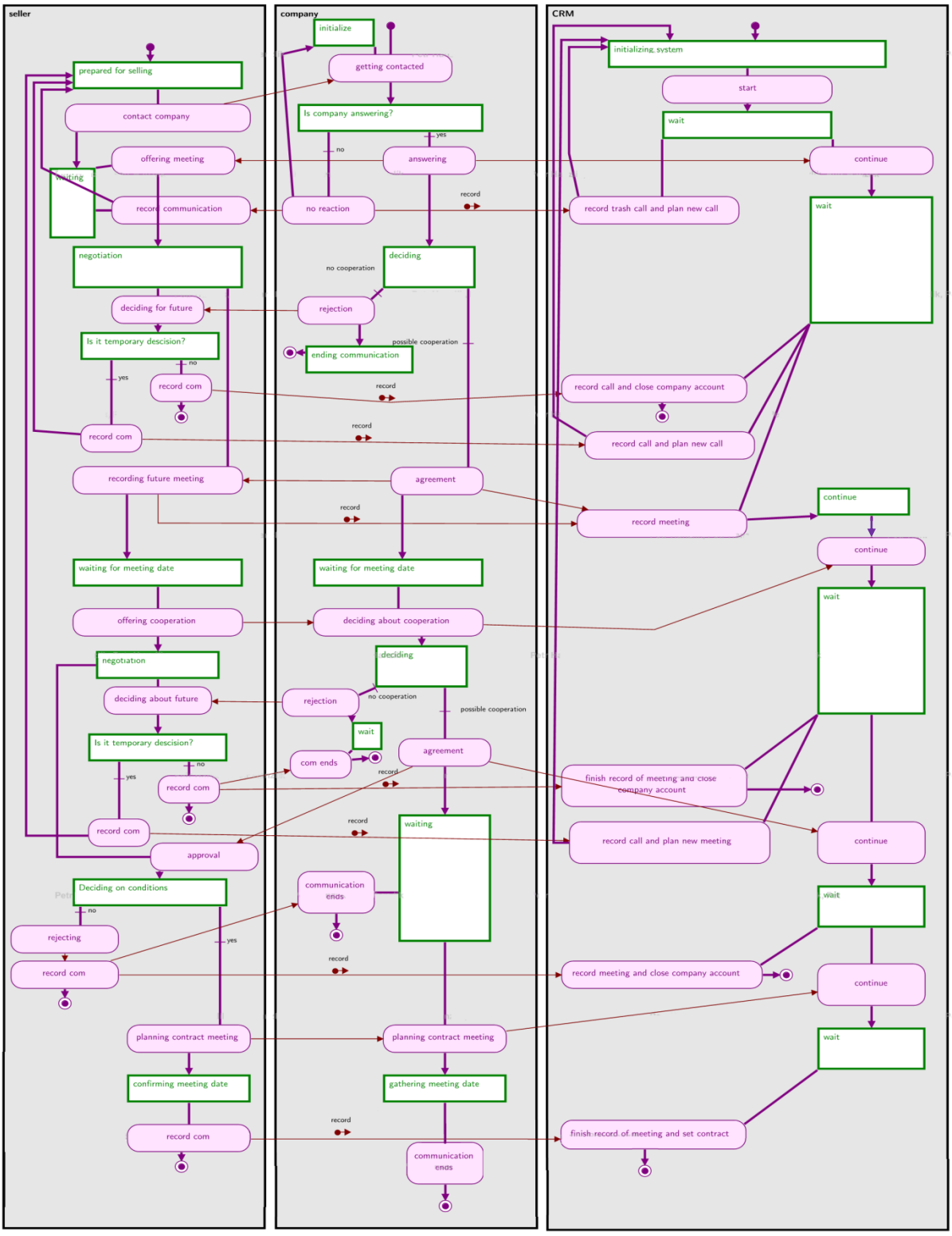


Figure 12: Business Diagram – Selling process (source: author, 2011)

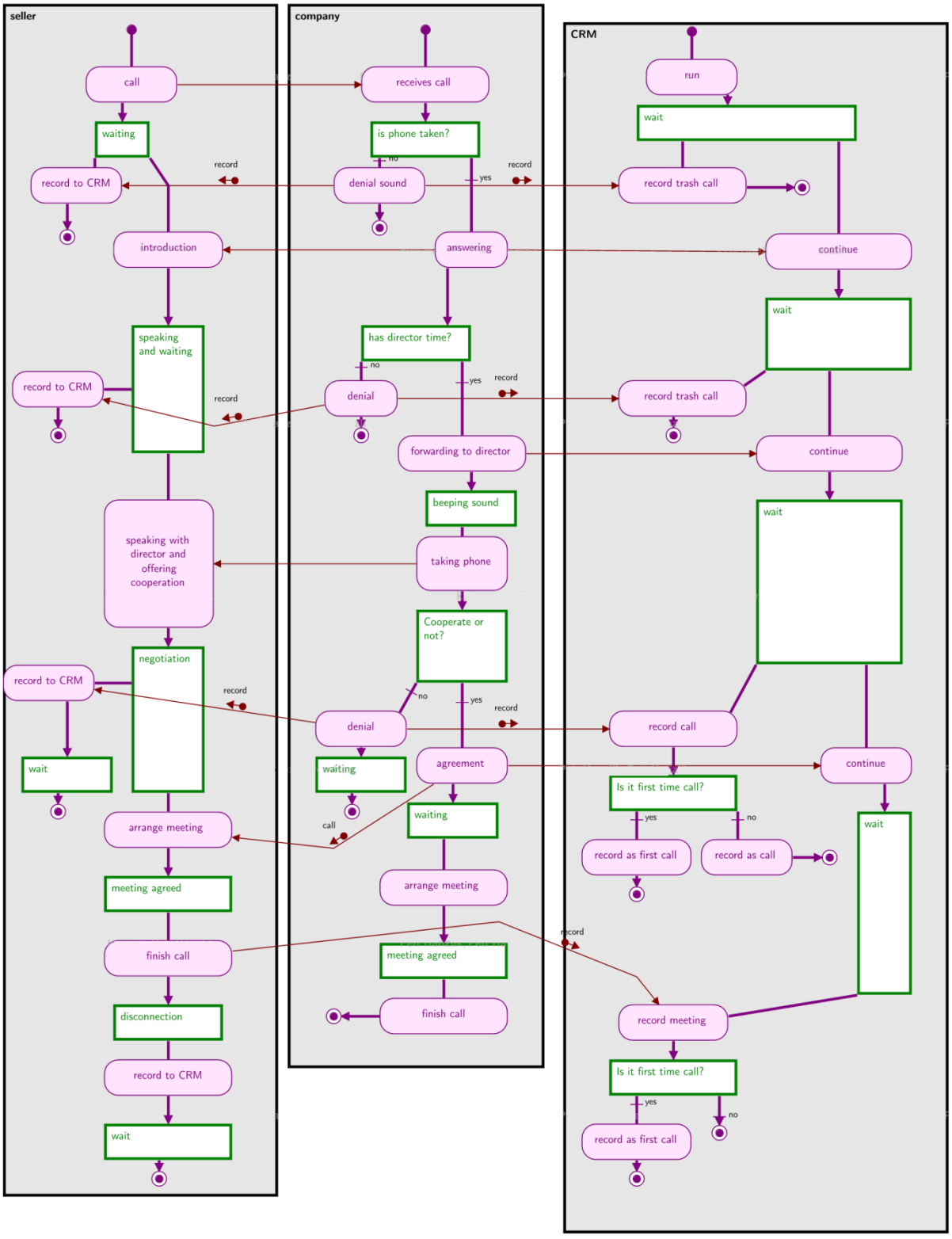


Figure 13: Business Diagram - Calling process (source: author, 2011)

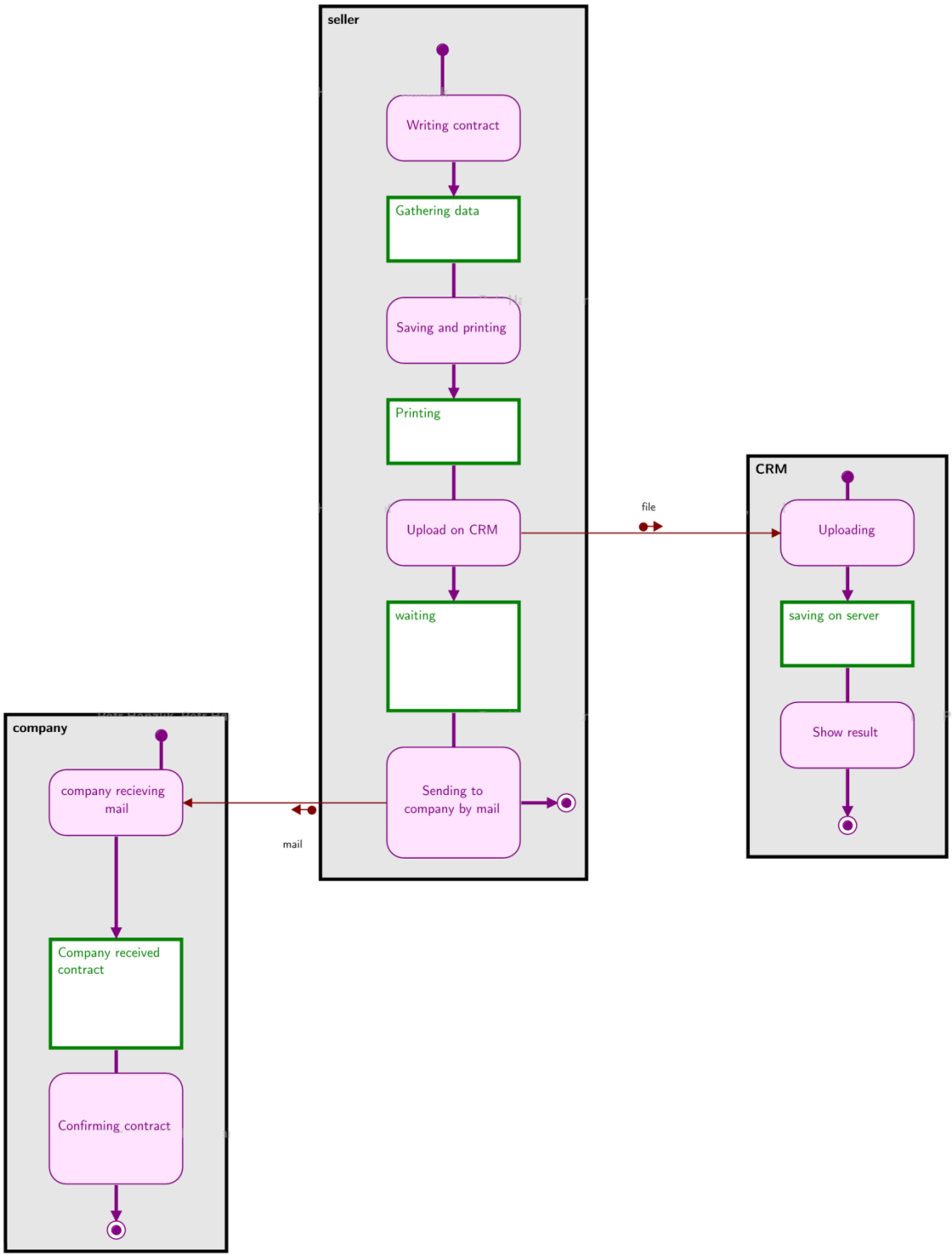


Figure 14: Business Diagram – Signing contract (source: author, 2011)

4.8 Objectives

As was mentioned, objectives should be based on common impressions from potential users. Users will be satisfied when the system will not only fulfil its function, but also satisfy needs of user. For example: Some company is creating new system according to needs of company (business process), but not according to needs of future users. In every company are specific working methodologies or certain processes which should developer understand. It is important to perceive processes in company also as employee of that company.

Author of thesis used for gathering this information by his knowledge of processes and expertise, because he was user of CRM. He also created form for users of current CRM and also leaders of teams.

Generally the output is following; respondents said “we need system which is”:

1. Simple to use
2. Clear interface
3. Quick in reaction (no delays)
4. Helping to us
5. Containing information from old CRM

Functions will be described in next parts.

4.9 Functionalities of new CRM

Functionalities are divided in logical order by sections. Functionalities are based on business process and needs of users of this system for their work.

Navigation will look like:

- Home
- Companies
- Statistics
- Utilities

- Administration

Home

Tasks

- List of future, current and previous communication records. Records contain date, company name, communication type, done/not done status. In case of status "not done" after date of fulfilment is font coloured red. Team leader can see aggregated tasks of his team.

Transactions / Requests

- Local branches can trade companies (company accounts) inside system. In home will be function for overview of orders and offers + possibility to accept or decline. Table contains columns company name, date of transaction, from who, to whom, agree or decline button.

News

- Possibility of main administrator to write news to all users. News is loaded in special tab in Home.

Companies

Search tool

- Simple form, filtered by basic values.
    - Company name
    - Registration ID (in Czech IČO)
    - City
    - Local Branch (select box)
    - Company status
    - Team name
    - Cooperation in

        - Belongs to me, my team, my local branch
    - Possibility to look into advanced filters
        - Communication start date
        - Communication end date
        - CZ NACE code
        - Branches of act
        - Full text

Create/Edit company

- This feature enables to create company based on registration number (IČO). User will insert only this piece of information and function will gather that information from Business Registry of the Czech Republic. It is also possible to add all information manually.
- Company information:
    - Contact data: Reg ID, Name, street, town, ZIP, web URL, CZ NACE.
    - Cooperation in – this can specify which type of cooperation is between AIESEC and company. Types are:
        - Internship taker
        - Sponsorship
        - In-kind
        - Career Days
        - Tvojekariera
        - Another corporate products
        - Talent Development
        - Media
        - Fundraising
    - Account ownership info: Local branch name, Team name, Owner name, Description (text area)
    - Status: This is giving special statuses to company (will be explained later)
        - Free to Local Branch

        - Free to All
        - Assigned
        - Ignored
        - Ended
    - Organization data: Legal form, Tax number (Y/N), Bankruptcy(Y/N), Composition (Y/N), Registration status, Date of establishment, Number of employees, Branches of act

Company profile

- Contains previously mentioned information
- Contains also communication block with list of all communications (will be explained later)
- Company contacts - Before user records communication he/she needs to assign communication under some contact person of company. This contact person has attributes as job position, number, e-mail and notes. User can write some impressions about the person to notes.
- Attachments – block with possibility to upload and download files as contracts, proposals, records, feedback sheets and so on.
- Google map – this feature shows location on Google map integrated inside the system
- IDOS map – integrated IDOS searcher. IDOS can according to address find nearest station. It can find transport connection between user's home and company's place.

Communication

- This part must be quick and simple, because it will be used often. Ideally provided by AJAX window.
- Communication box contains:
- Type of communication (select box):
    - Trash call – it is call to secretary or not decision maker which postpone communication. It can be also recorded message for answering machine.
    - Call
    - E-mail

        - Business meeting
        - Account management call/email – communication focused on customer care
        - Account management meeting
        - Other contact
        - Contract
        - Resign
        - Event – for example: User met some person on some networking event
    - User
    - Contacted person
    - Date and time
    - Note – text area for creating notices about communication. For example: "Business meeting went well, company is interested internships for financial department."
    - Button for creating record
    - Button for creating record and set this task to Done status

Company log (history of company's account in CRM) – This block contains all actions which were made in certain company. For example: changing of ownership, change of content, communications, uploading files, changing of company status and so on.

Company statuses

- Free to All – thanks to this status can every user of CRM assign under his/her account. There is not needed permission of previous owner.
- Free to Local Branch – similar to Free to All, but there is not needed permission in case of same Local Branches user, but for other branches is needed permission.
- Assigned – means that company is actively used by some user.
- Ignored – company or AIESEC don't want to cooperate for temporary time.
- Ended – Company is not existing (acquisition, fusion, bankrupt, closed) or AIESEC won't cooperate (weapon producers, tobacco producers or politicians)

Statistics

General look

- Statistics are creating from filter form and result list.
- Filter contains – Name, Local Branch, Team, Start Date and End Date.
- Result list contains
    - Name
    - Trash call
    - First call – call which was made firstly in company or call in company where was no communication for one year
    - Call
    - First meeting – analogy with first call and call
    - Meeting
    - Contract
    - Resign – is contract which has same content and it is assigned to same company. For example company is every year taking 3 interns.
    - Account Manager Call – call or email communication to keep good relations with company
    - Account Manager Meeting
    - Score

Score

- This feature is calculating results of users to some coefficients. By those coefficients could be users compared and appreciated. Thanks to this is also shown productivity and abilities of local branches. The result list of statistics could be ordered by those scores.
    - TOP caller = 5*first contact + 3*call + 1*trash call
    - TOP businessman = 15*first meeting + 10*meeting + 5*first contact + 3*call + 1*trash call

- TOP seller = 30*contract + 15*first meeting + 10*meeting + 5*first contact + 3*call + 1*trash call

Utilities

- In this category will be only useful links. Links can administrate admin.

Administration

User's management

- This feature can create/edit user account. It will not be possible to delete account, but only disable (deactivate) to access system. Due to optimization will be preferred to not process all database, but only active users.
- System recognize different user levels:
  - Member – can view all companies and edit its companies
  - Team leader – has members rights and can manage his/her member's companies
  - Executive Board – can manage whole teams in local branch, create teams and create user accounts.
  - Member Committee – manage all companies and create local chapters.
  - Local Branch (alias Local Committee, Local Chapter, Local Entity) – is entity in system. It is not account type.
- Higher user level can manage lower level (=has same rights).

Profile

- Can see everybody. Every user has own profile. It contains: Full name, Local Branch, Avatar (profile picture), type of user (member, team leader, executive board, member committee), team, email, mobile contact, statistics of user, list of user's companies

4.10 Technology

Programming language used for creating new CRM was PHP framework Nette 2.0. System is hosted on dedicated server with MySQL 5.1. Additionally is used JavaScript and AJAX.

Nette 2.0. is PHP 5 framework with support of MVC. It is developed by Czech programmer and publicist David Grudl.

Main features of Nette framework is:

- **Advanced security** – framework is programmed with focus on security problematic as Cross-site scripting, Cross-site request forgery, session hijacking, session fixation and more. Framework itself controls validity of inputs which user or potential hacker want to use for malicious behaviour.
- **Debugging tools** – framework has own tool for managing errors and bugs. It is built user-friendly that programmer will find problem quickly to repair it.
- **Performance** – Nette is programmed so well that in independent benchmark is performing as one of the best PHP frameworks.
- **Good programming habits** – Nette is having own philosophy of programming which should be supporting programmer in development. It is object oriented.
- **Connection to database** – Thanks to module dibi (database layer) is programmer able to choose database independently. Dibi handles the transmission for him/her. Thanks to this is Nette opened for well-known database management systems.
- **Documentation and podcast** – community of Nette is supporting beginners to use this framework
- **Opensource** – it is free to use

4.11 Wireframe

Wireframe is important for designers and coders. In this thesis are not all possible scenarios.

General layout – overview (see Figure 15)

The page could be divided into three main parts: header, navigation and body. Header contains logo with descriptor and user information. Body is showing particular content. Navigation contains links to all sections in CRM.

- ***Home*** – this section doesn't contain any subsections. It contains tasks and requests which were mentioned in Objectives.
- ***Company*** – this section does not contain any subsection, default page is Search Company. User can open certain company from the search tool and same is for creation of new company account in CRM.
- ***Statistics*** – contains statistical data of sellers' activity. It is divided into sections Members, Teams and Local Entities. Section is able to create detailed output of every user in selected period of time. Filter "Teams" is focused only on team performance and Local Entities shows results of each local chapter/university.
- ***Utilities*** – this section is containing only navigation links which are editable by administrator. It is linking to useful websites as IDOS, Business registry, CZ NACE codes, Ipoint and also internal systems of AIESEC.
- ***Administration*** – this section contains sub-sections My profile, Members, Teams. In
    - My profile user edits his/her personal information, login data etc.
    - Page Members helps to create, change or deactivate user accounts.
    - Analogically works page Teams, there is possibility to create, change or deactivate teams.

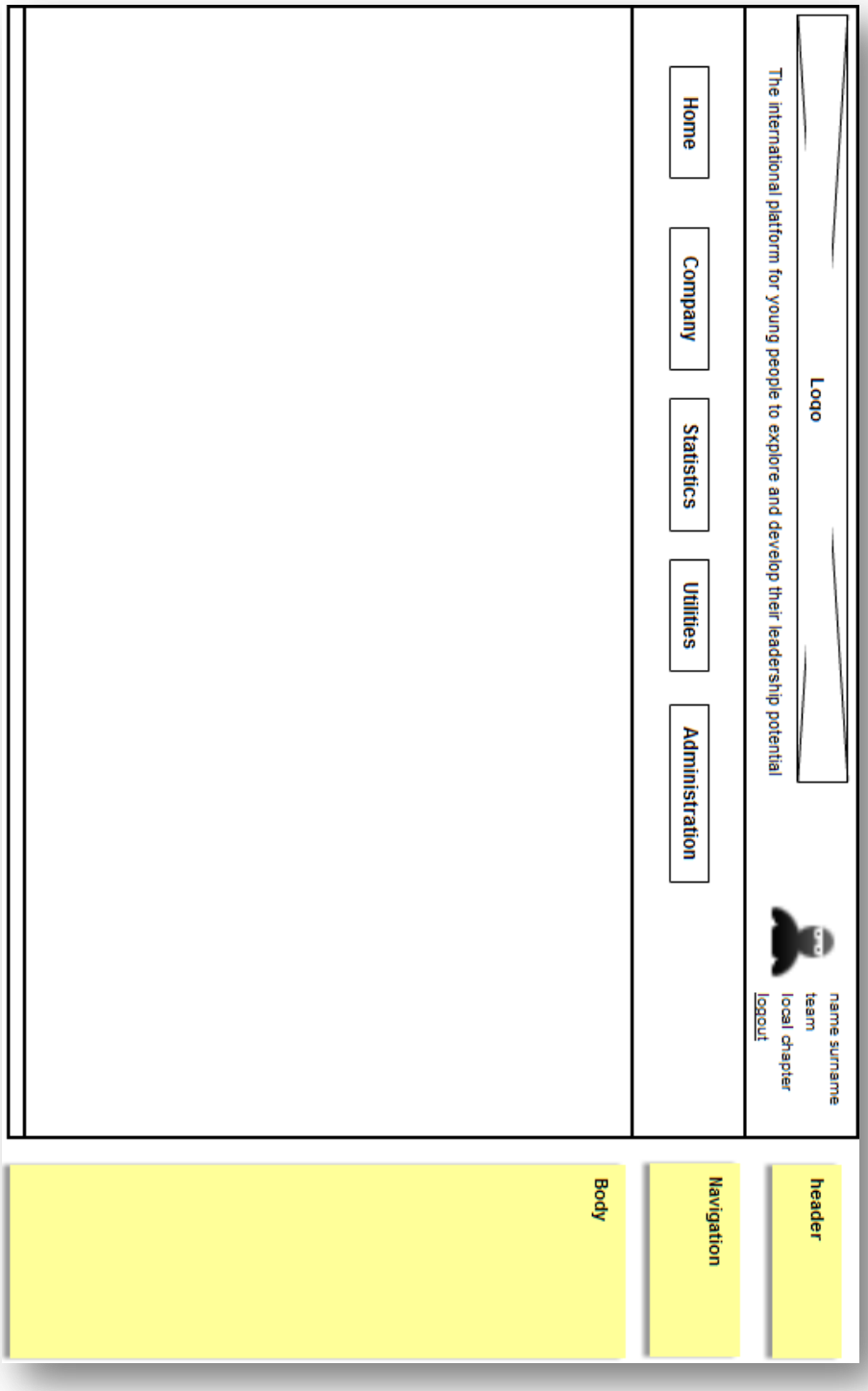


Figure 15: Wireframe - General layout (source: author, 2010)

Login page

Login page is different from internal system. It has header with logo and descriptor, body with login table, footer with copyright.

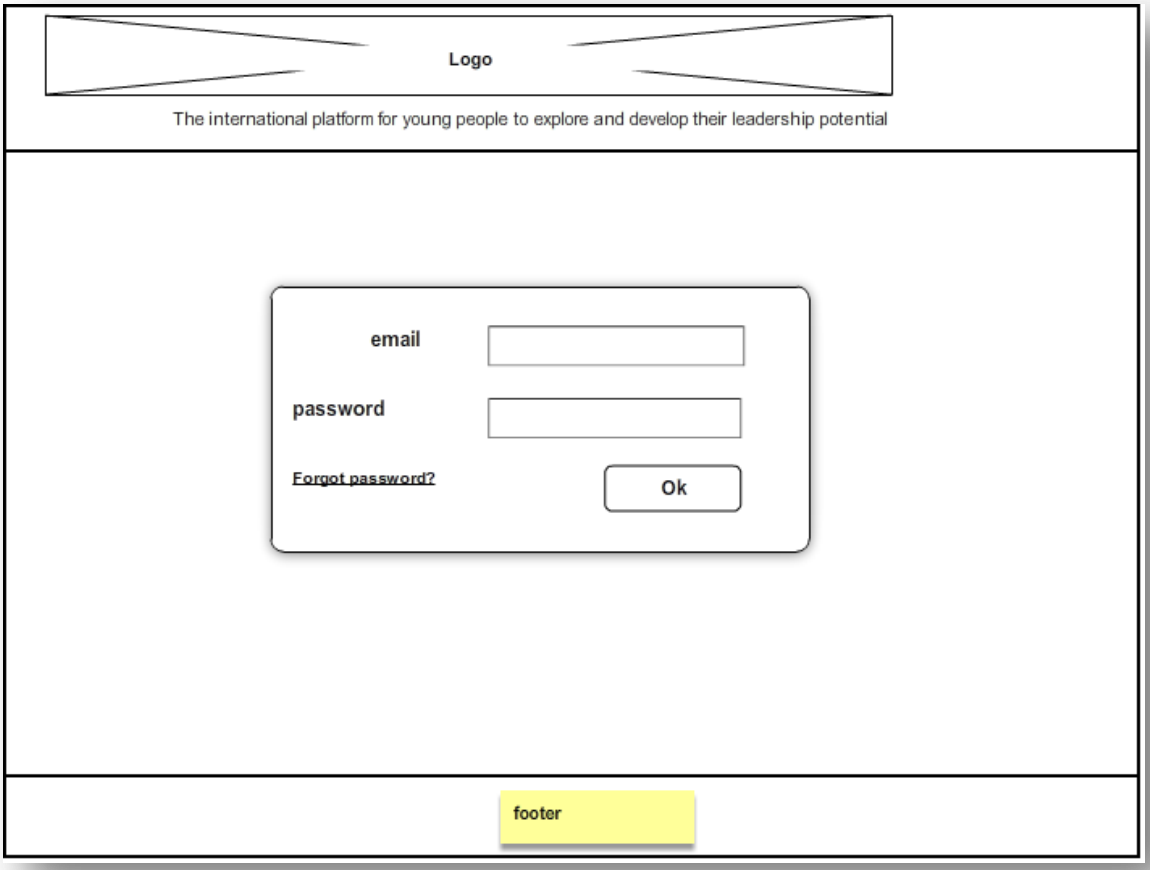


Figure 16: Wireframe - Login page (source: author, 2010)

Home page – Tasks

This page is default after signing in. Tasks are supporting user to manage his/her agenda. User can choose from subsections:

- My tasks – default selected page. It contains planned and missed tasks.
- Teams (x+y) – shows task of teams of subordinated team or teams.
    - x … number of tasks
    - y … number of missed tasks (red font)
- News – showing generated content from administrator
- My requests – shows requests for companies from other users to user or from user to other users.
- Requests – shows all requests or subordinated entities (team or teams)

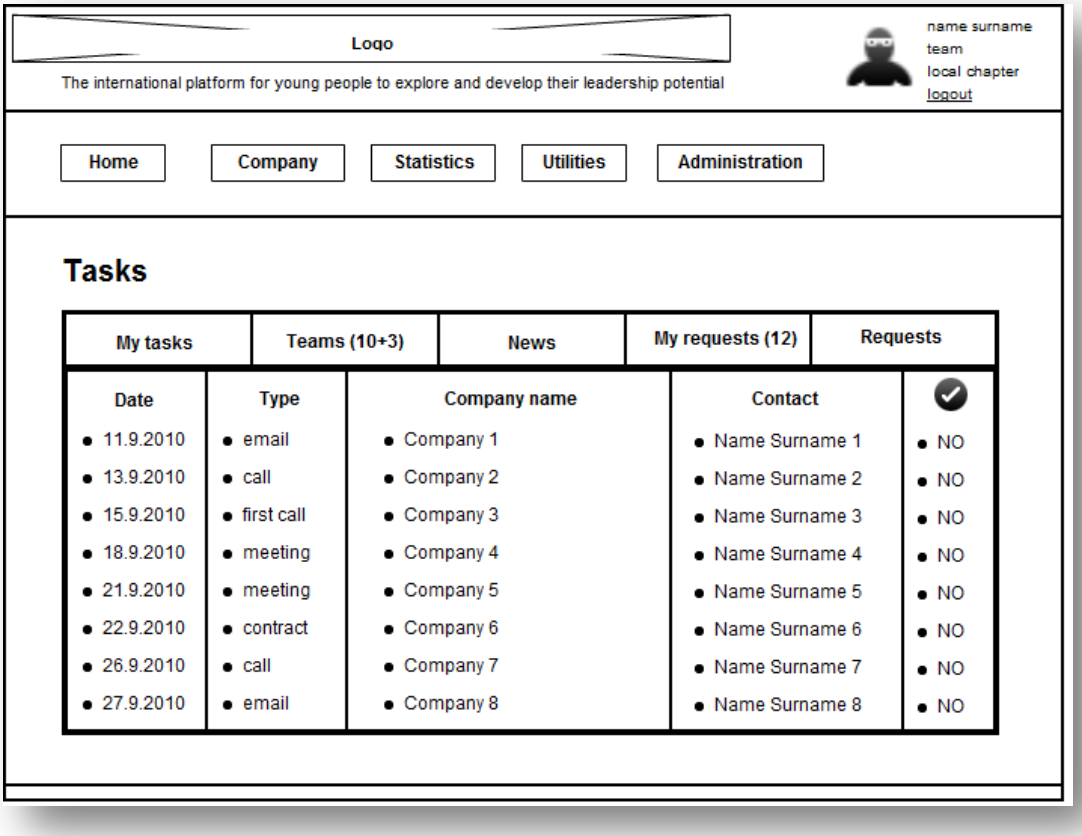


Figure 17: Wireframe - Tasks (source: author, 2010)

Companies – search

This is default page of section Company. It contains search form. Table of results is loaded under the search form. User can open company profile from the results.

Add New Company feature is loaded to AJAX window with form.

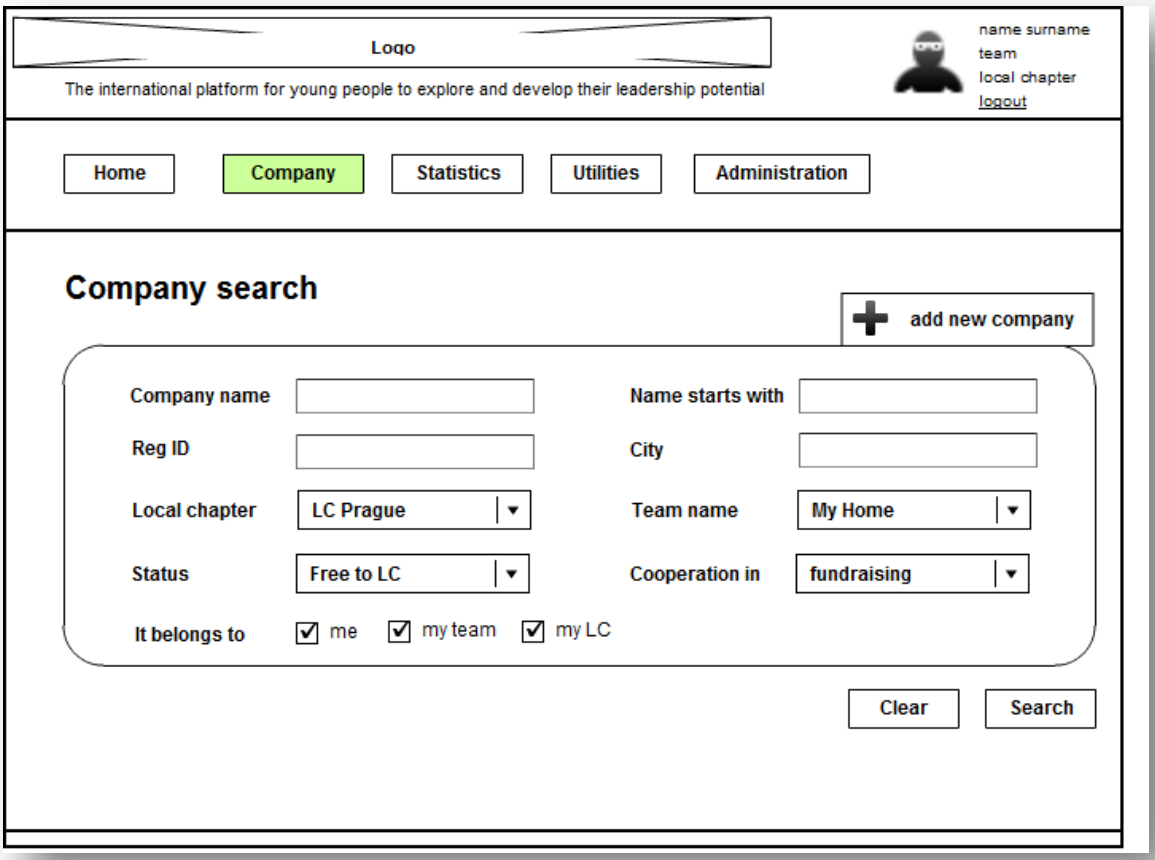


Figure 18: Wireframe - Company search (source: author, 2010)

Company profile – map

Map is page in company profile. This page is using API of Google Maps and finding the location of company based on company's address.

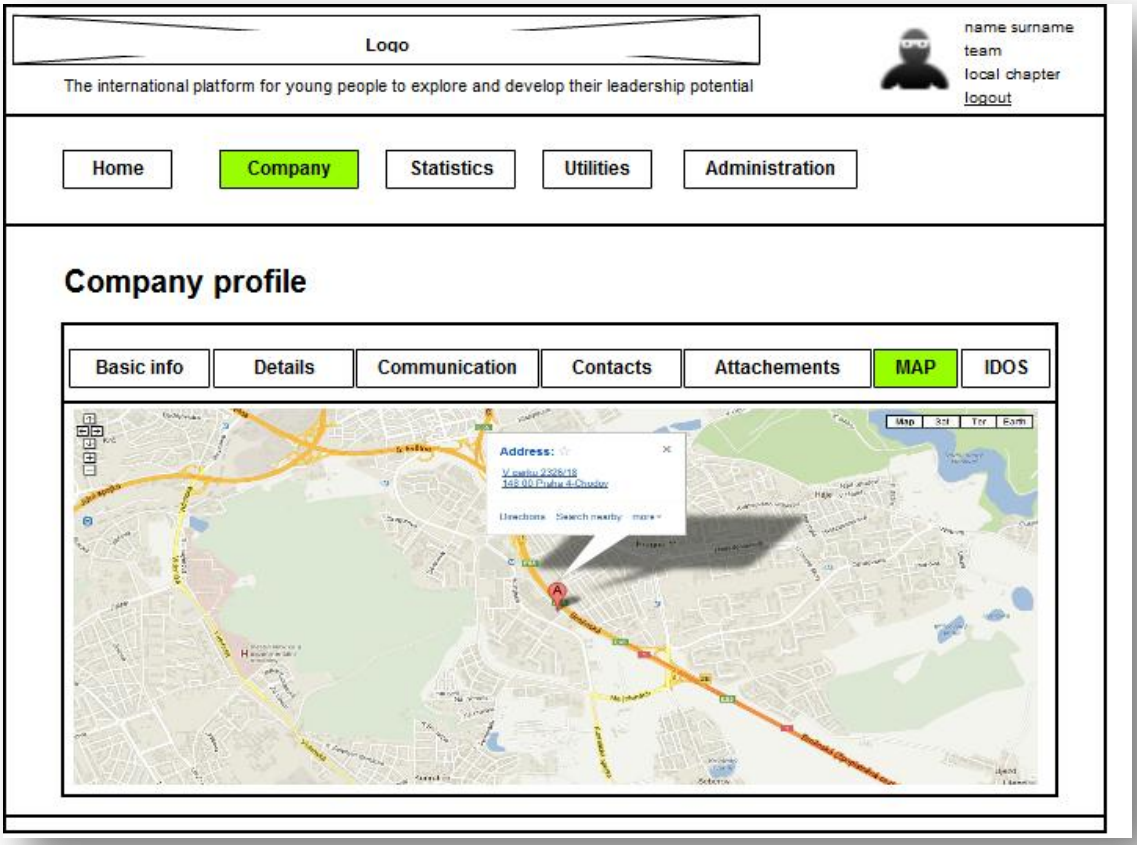
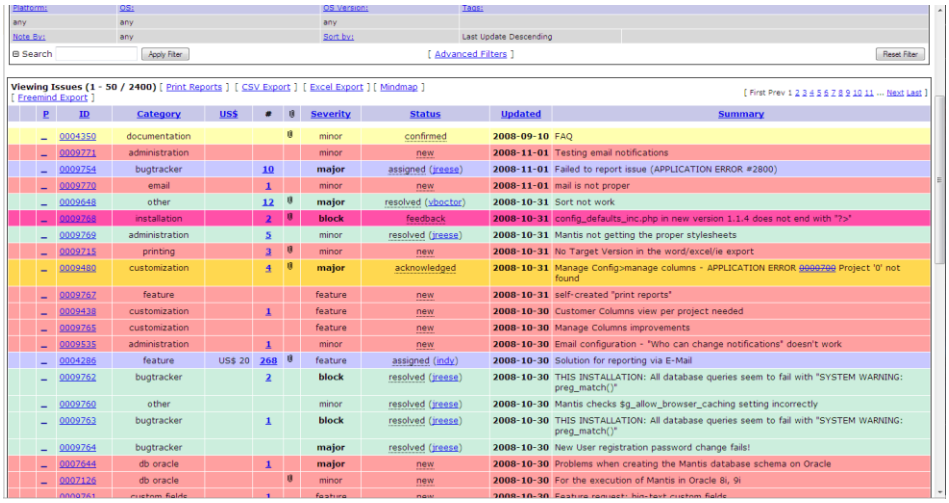


Figure 19: Wireframe - Map (source: author, 2010)

4.12 Testing

Testing was working on daily basis. Used software for bug tracking was open source Mantis Bug Tracker. Users had possibility to feedback directly from the CRM system. Author was responsible for collection this feedback and prioritizing updates.



Viewing Issues (1 - 50 / 2400) [Print Reports] [CSV Export] [Excel Export] [Mindmap] [Freemind Export]

P	ID	Category	US$	#	Severity	Status	Updated	Summary
_	0004350	documentation			minor	confirmed	2008-09-10	FAQ
_	0009771	administration			minor	new	2008-11-01	Testing email notifications
_	0009754	bugtracker		10	major	assigned (jreese)	2008-11-01	Failed to report issue (APPLICATION ERROR #2800)
_	0009770	email		1	minor	new	2008-11-01	mail is not proper
_	0009648	other		12	major	resolved (vboctor)	2008-10-31	Sort not work
_	0009768	installation		2	block	feedback	2008-10-31	config_defaults_inc.php in new version 1.1.4 does not end with "?>"
_	0009769	administration		5	minor	resolved (jreese)	2008-10-31	Mantis not getting the proper stylesheets
_	0009715	printing		3	minor	new	2008-10-31	No Target Version in the word/excel/ie export
_	0009480	customization		4	major	acknowledged	2008-10-31	Manage Config>manage columns - APPLICATION ERROR 0000799 Project '0' not found
_	0009767	feature			feature	new	2008-10-31	self-created "print reports"
_	0009438	customization		1	feature	new	2008-10-30	Customer Columns view per project needed
_	0009765	customization			feature	new	2008-10-30	Manage Columns improvements
_	0009535	administration		1	minor	new	2008-10-30	Email configuration - "Who can change notifications" doesn't work
_	0004286	feature	US$ 20	268	feature	assigned (indy)	2008-10-30	Solution for reporting via E-Mail
_	0009762	bugtracker		2	block	resolved (jreese)	2008-10-30	THIS INSTALLATION: All database queries seem to fail with "SYSTEM WARNING: preg_match()"
_	0009760	other			minor	resolved (jreese)	2008-10-30	Mantis checks $g_allow_browser_caching setting incorrectly
_	0009763	bugtracker		1	block	resolved (jreese)	2008-10-30	THIS INSTALLATION: All database queries seem to fail with "SYSTEM WARNING: preg_match()"
_	0009764	bugtracker			major	resolved (jreese)	2008-10-30	New User registration password change fails!
_	0007644	db oracle		1	major	new	2008-10-30	Problems when creating the Mantis database schema on Oracle
_	0007126	db oracle			minor	new	2008-10-30	For the execution of Mantis in Oracle 8i, 9i

Figure 20: Example of Mantis interface (source: http://www.wikimedia.org/)

4.13 Education of CRM

New CRM was educated on 4 meetings. Total number of participants was 60. Users were educated by demonstration of the product. They tried to simulate usage on case studies.

For example:

- Find company
- Change data in company
- Create new company based on company id
- Create new company without automatic feeding from Business Registry
- Generate statistics of your team
- Generate statistics of your local entity
- Record communication
- Plan your meeting

4.14 Suggesting innovations for upgrade

Based on feedbacks from users after delivery of the first part are three key priorities to be done:

1. Detailed lists – when user generates statistics, he/she is able to know only numbers of calls, meetings, contracts and other. Goal of this feature will be in detailed listing. After clicking on certain number will user see what company, by whom, with what result and when was contacted.
2. Mailing – There are notifications which needs to be send to user's email. For example overdue tasks, requesting companies or business emails to companies.
3. Shared user rights on company – during run of new system author found that in some cases is needed to be able to record communication to one company by more people. Sometimes even from different local entities. For example: There is one big corporation offering grants for non-profit projects. There are 3 local entities applying, but only one has rights to record this process.

Third upgrade should be focused on not only sales area, but also other areas focused on communication with clients, but that is completely new and complex system.

5 Result of case study

Case study was successfully completed with usage of BORM analysis, UML and survey. Based on facts from analysis was created concept for new CRM. Programming and design was done by external company. Education and testing was executed successfully.

Output of practical part is fully working information system supporting CRM in sales.

Created CRM is different from mentioned CRMs mainly in one feature. It is financial overview in business. It is because this CRM is built for NGO and this organization is not tracking this statistic, its main measured values are number of signed contracts, no matter if it is profitable or not.

Development process was created based on concrete needs of selected company and by Waterfall model.

5.1 Performance comparison

This statics was generated for comparison of productivity in sales between dates 1.11.2010 – 1.3.2011 and 1.11.2011 – 1.3.2012.

Table 1: Comparison of sales results from 2010 and 2011

	TC	FC	C	FM	M	CO
2010	597	1135	952	396	156	40
ratio				5.270202		13.8
2011	1014	1697	1373	558	196	69
ratio				5.501792		10.92754

Description of measured values:

- Trash call (TC) – call which was not leading to decision maker (not existing number, answering machine, secretary etc.)
- First call (FC) – call which was made firstly in company or call in company, where was no communication for one year.
- Call (C) – call to company where was some previous communication
- First meeting (FM) – analogy with first call and call
- Meeting (M)
- Contract (CO) – signed contract with company

The most important value in statistics is number of signed contracts. In period in 2010 was the number of contracts 40 and in 2011 it was 69. That is more than 70% growth.

Other important value is ratio in new sales. That could be derived from relation of first calls + calls and first meetings. The goal is to have this ratio small, because it means "how many calls seller needs to call to have meeting". In 2010 it was less than in 2011. We can assume that sellers are less skilled in arranging meetings, do less segmentation (finding the right target customer). From external point of view it can mean that companies are not willing to cooperate as before. And from technical point of view it can mean that in past users of CRM were not filling all first calls properly.

External factor which could influence measurements:

- Economic crisis – in the beginning of 2011 are companies slowly recovering from crisis and are willing to do business more than in 2010.
- Pricing – prices of products could decrease due to crisis which lead to increase of signed contract.
- Projects for NGOs – products are differentiated for corporate sector and non-profit. Thanks to this segmentation (done in 2011) could be signed contracts in higher numbers.
- Fundraising – this trend started in 2010, but more results came in 2011. This is new type of gaining money for projects and it increases number of contracts.

The second ratio is ratio between first meetings + meetings and contracts. It means "how many meetings seller needs to sign contract". This statistic is better in 2011. Sellers are the most probably more prepared and skilled for business meetings. It can be also influenced by types of products, their improvement or pricing.

5.2 Highlights

The best features are:

1. Feeding information from Business Registry – user need to know only ID number of company (IČO) and system loads the data from Business Registry and ARES. It is making user's work more efficient.
2. Connection to Google Maps API – User can orientate where is targeted company
3. Transportation – CRM is connected to Czech system IDOS which is helping user to find connection between company and his/her start point. Start point can be set in profile settings.
4. Generating statistics – User can generate output of statistics for certain period and certain entities. Thanks to this can be monitored improvement and based on this can be rewarded and recognized certain seller, team or entity.
5. Managing company accounts – thanks to CRM can be clearly divided companies to entities. Never can happen that other entity will communicate with company who is already in process with other entity. It is making transparent relations which increases professional behaviour.
6. Managing tasks – user can see his current and future tasks to be sure how is the selling process going with certain company. Team leaders or other supervisors can see easily what their subordinates are doing.

5.3 Final product - design

Brand colours of AIESEC were in 2010 combination of orange and blue. Due to this fact is design based on these colours. Every page has to have logo with descriptor. After signing in there must be user information and logout feature. Design was created based on author's preferences and wireframes by external company. Figures are in chapter Attachments.

6 Conclusion

In literature overview were defined facts about CRM, its advantages, trends and examples of commercial and open source CRM systems.

Practical part was about whole development of CRM as information system for support of sales in organization AIESEC.

Firstly were analysed issues of current CRM systems which main disadvantages were in slow speed, ownership of code (provider keeps it), big costs on upgrading CRM and non-efficient interface solution which made users to not using it as their support, but because they had to.

In analysis of user needs by survey author found many interesting inputs which author used in creation of new concept.

For analysis of business processes author used BORM methodology which gave him easily understandable diagrams of internal and external processes in sales. Concept of new CRM as output of the practical part was using UML, wireframes and documentation with all features and functionality.

In process of development author was also responsible for testing the software and learned how to cooperate on project like this in team. Part of the induction process is also education of the system to its users. In this part author learned importance of education, because without right expectations and understanding wouldn't be system used as it should be and its additional value would be decreased.

Finally the biggest outcome of practical part was fully functional software which supported sales and after one year it increased sales by more than 70%. This proves that investment in information systems worth it.

During thesis author found many interesting points of view on this problematic which author didn't consider on the first sight. Author confronted theory with development in real situation. Author found that working on development of information systems could be author's future focus in his live.

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9 Attachments

Login page

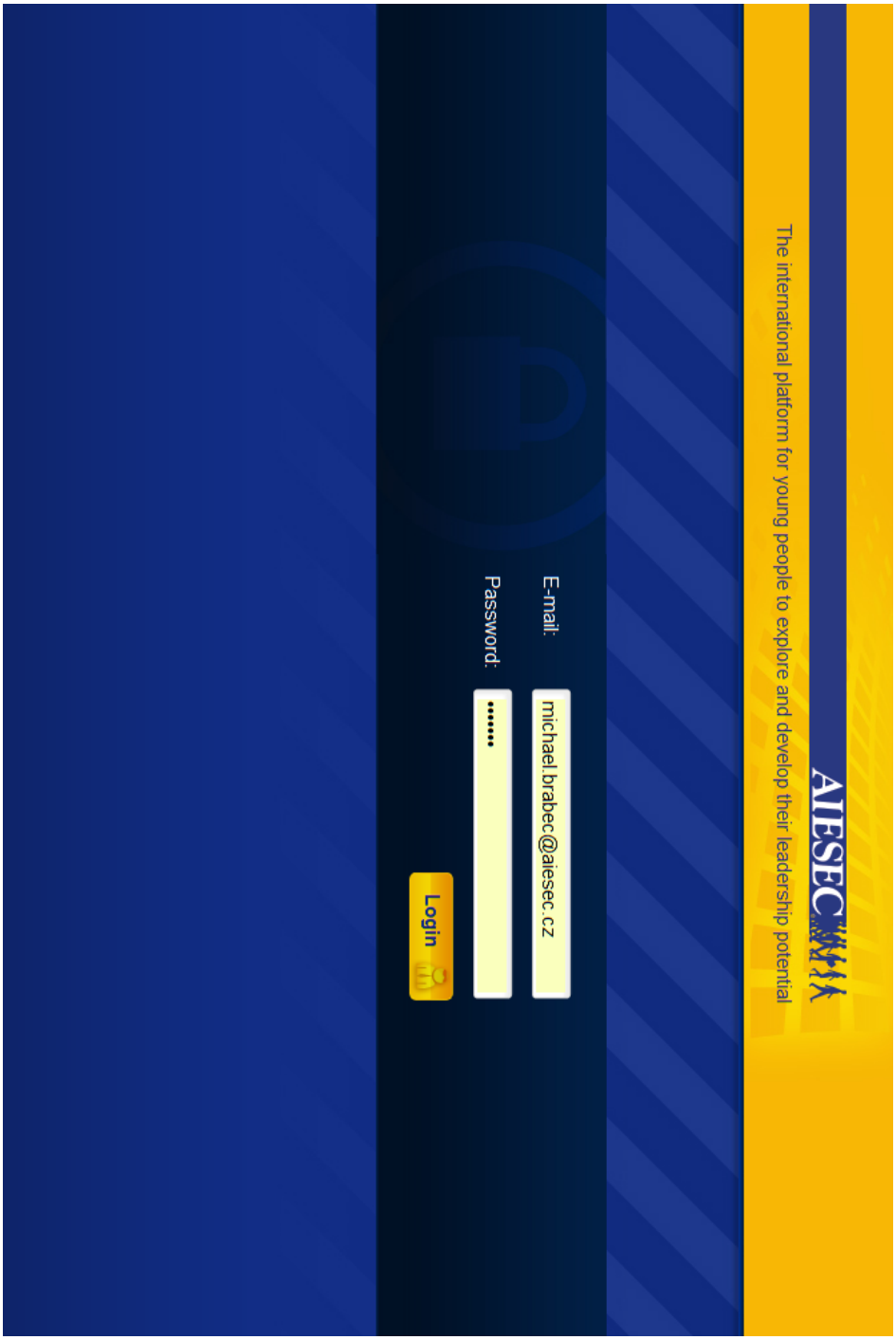

Figure 21: Screenshot - Login page (source: crm.aiesec.cz, 2011)

Companies – search

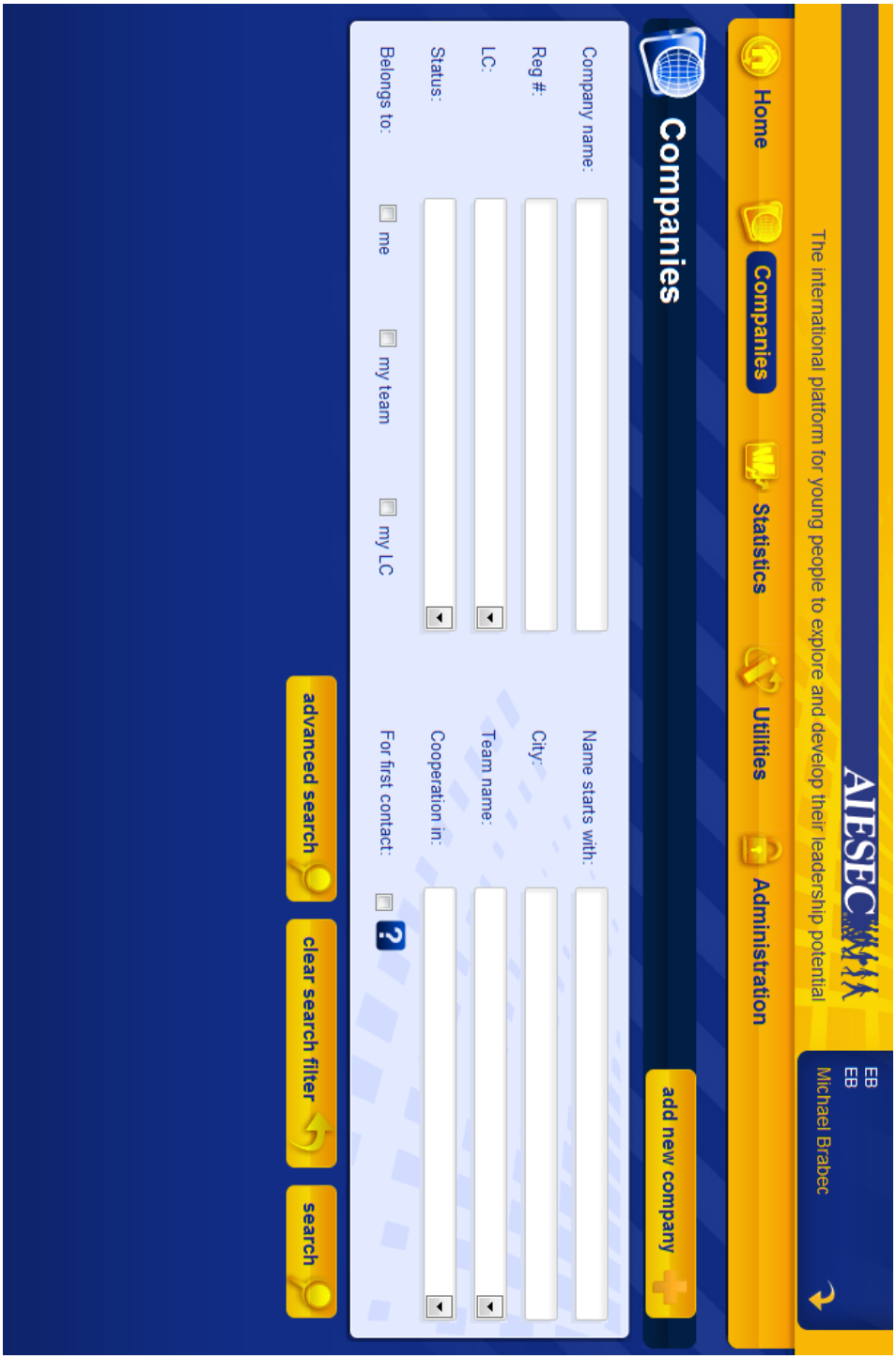

Figure 22: Screenshot - Company page (source: crm.aiesec.cz, 2011)

Company – map

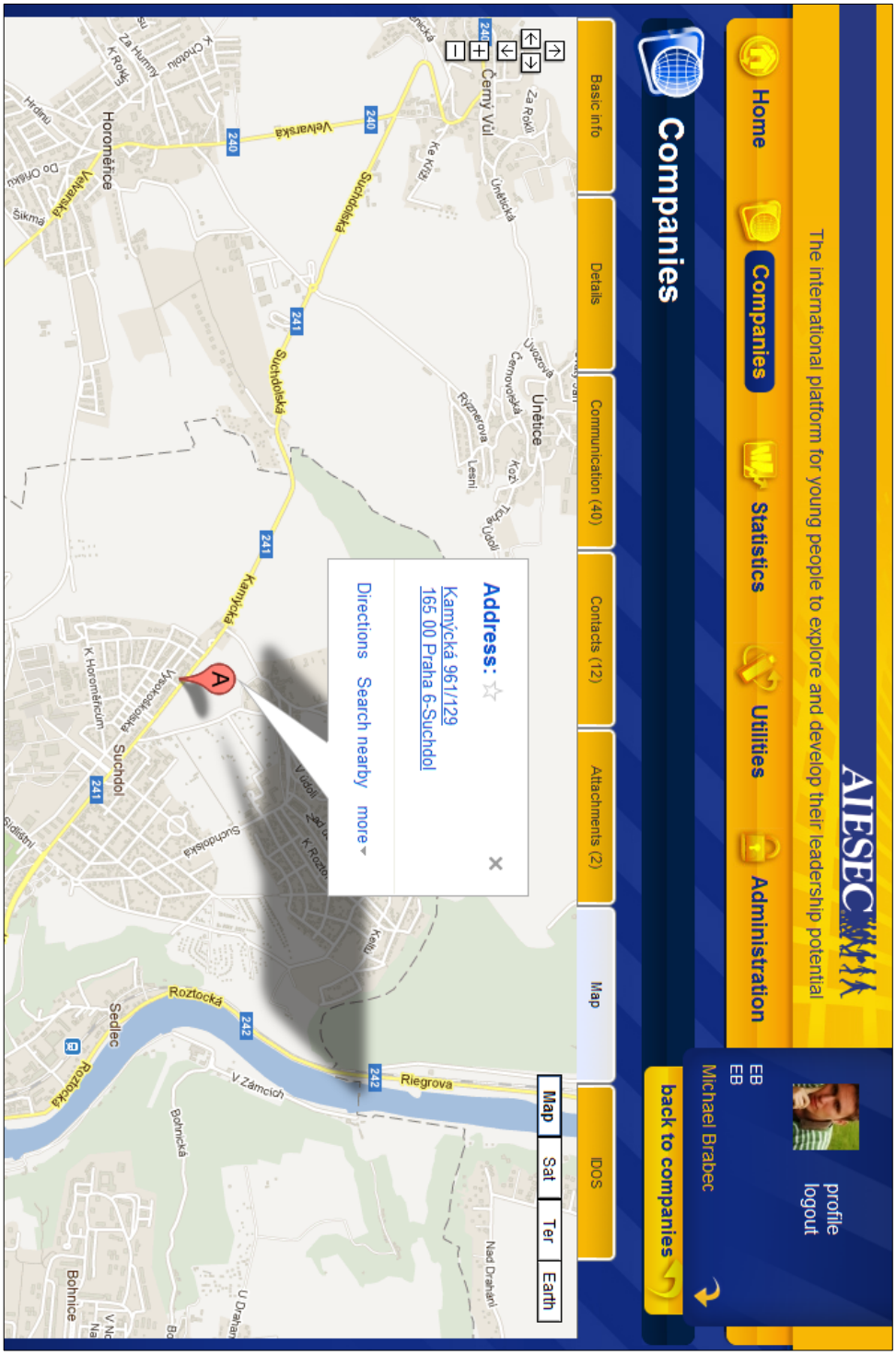

Figure 23: Screenshot - Map (source: crm.aiesec.cz, 2011)