ANALYSIS OF HIGH FAILURE RATES OF CRM PROJECTS IN TELECOMMUNICATION SECTOR AND PROPOSAL FOR A ROAD MAP ELABORATION

A THESIS SUBMITED TO
THE GRADUATE SCHOOL OF INFORMATICS
OF
THE MIDDLE EAST TECHNICAL UNIVERSITY

BY

ALİ YÜKSEL ÇAĞLAYAN

INPARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER SCIENCE
IN THE DEPARTMENT OF INFORMATION SYSTEMS

JANUARY 2016

ANALYSIS OF HIGH FAILURE RATES OF CRM PROJECTS IN TELECOMMUNICATION SECTOR AND PROPOSAL FOR A ROAD MAP ELABORATION

Submitted by Ali Yüksel Çağlayan in partial fulfillment of the requirements for the degree of Master of Science in Information Systems, Middle East Technical University by,

Prof.Dr. Nazife Baykal
Director, Informatics Institute METU _____

Prof.Dr.Yasemin Yardımcı Çetin
Head of Department, Information Systems METU _____

Dr. Ali Arifoğlu
Supervisor, Information Systems METU _____

Examining Committee Members

Prof.Dr. Yasemin Yardımcı Çetin
Information Systems METU _____

Dr.Ali Arifoğlu
Information Systems METU _____

Prof.Dr.Nazife Baykal
Information Systems METU _____

Assist.Prof.Dr.Erhan Eren
Information Systems METU _____

Prof.Dr.Ali Yazıcı
Software Engineering ATILIM _____

Date: 11.01.2016

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct. I have fully cited and referenced all material and results that are not original to this work.

Name, Last Name: Ali Yüksel ÇAĞLAYAN

Signature:

ABSTRACT

ANALYSIS OF HIGH FAILURE RATES OF CRM PROJECTS IN TELECOMMUNICATION SECTOR AND PROPOSAL FOR A ROAD MAP ELABORATION

Ali Yüksel Çağlayan

Department of Information Systems

Supervisor: Dr. Ali Arifoğlu

January 2016, 115 pages

Necessity of identifying customers, creating value for them, meeting their needs as soon as possible and creating a customer centric company culture created a new concept named CRM (Customers Relationship Management). CRM is a cultural aspect which aims to create customer centric structure and culture and also more value for customers.

The failure rate of CRM projects is significantly high. The failure rate is higher for Telecommunication sector because of some sectoral specifications and difficulties. At this thesis work, by the help of literature reviews and conversations with sector professionals, reasons of high failure rate of CRM projects at Telecommunication sector are stated. Also, preventive actions that can be taken to prevent these failures are stated by the help of literature reviews. To create a more useful outcome, these preventive actions are stated on a new system implementation project road map so a road map elaboration for CRM projects of Telecommunication Sector is proposed.

Also, two CRM implementation projects of telecommunication sector companies are analyzed to validate the extended road map that is proposed by this thesis work. By the help of this analysis, consistency ratio between preventive actions coverage ratios and success ratio of projects are stated.

Keywords: Customer relationship management, CRM, Telecommunication Sector

ÖZ

TELEKOMÜNİKASYON SEKTÖRÜ MİY PROJELERİNDEKİ YÜKSEK BAŞARISIZLIK ORANLARININ İNCELENMESİ VE BİR YOL HARİTASI AYRINTILANDIRMA ÖNERİSİ

Ali Yüksel Çağlayan

Bilgi Sistemleri Bölümü

Danışman: Dr. Ali Arifoğlu

Ocak 2016, 115 sayfa

Müşterileri tanıma, müşteriler için değer yaratma, müşterilerin gereksinimlerini en kısa sürede karşılama ve müşteri odaklı bir kurum kültürü oluşturma gereksinimi MİY (Müşteri İlişkileri Yönetimi) kavramını oluşturmuştur. MİY, müşteri odaklı bir yapı ve kültür oluşturmayı ve müşteriler için daha fazla değer yaratmayı hedefleyen kültürel bir kavramdır.

MİY projelerinin başarısızlık oranı çok yüksektir. Bazı sektörel sebepler ile başarısızlık oranı Telekomünikasyon sektörü için ise daha yüksektir. Bu tez çalışması kapsamında, literatür araştırmaları ve sektör uzmanları ile yapılan görüşmeler neticesinde, Telekomünikasyon sektöründe yapılan MİY projelerinin başarısızlık sebepleri tespit edildi. Ayrıca, bu sebepleri ortadan kaldırmak için alınabilecek önleyici eylemler de literatür çalışmalarında tespit edildi. Daha faydalı bir sonuç üretmek için ise bu önleyici eylemler yeni sistem kurulum projelerinde sıklıkla kullanılan klasik bir proje yol haritası üzerinde gösterildi yani Telekomünikasyon sektörü MİY projeleri için bir yol haritası zenginleştirme önerisi sunuldu.

Ortaya çıkarılan bu zenginleştirilmiş yol haritasının doğrulanabilmesi için ise, daha önceden Telekomünikasyon sektöründe yapılmış iki MİY projesi analiz edildi. Bu analiz neticesinde, önleyici eylemlerin projelerde kapsanma oranları ile projelerin başarısı arasındaki istatistiksel tutarlılık tespit edildi

Anahtar kelimeler: Müşteri İlişkileri Yönetimi, MİY, Telekomünikasyon Sektörü

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ABBREVATIONS AND TERMS

The following terms, acronyms and abbreviations are referred to in this thesis work.

Term	Definition
ADSL	Asymmetric digital subscriber line
BPR	Business Processes Reengineering
Chi Square	Mostly used statistical method that aims to show the relation type between data sets
Churn	Number of individuals or items moving into or out of a collective over a specific period of time
CRM	Customer relationship management
CSF	Critical success factor
CTO	Chief Technology Officer
GSM	Global System for Mobile Communications
IDC	International Data Corporation
IS	Information System
ISV	Independent Software Vendor
IT	Information Technology
IVR	Interactive voice response
KM	Knowledge management
KPI	Key performance indicator
KSF	Key success factor
Normal Distribution	Distribution with zero mean value and one standard variation value
PSTN	Public Switched Telephone Network
RACI	Responsible, Accountable, Consulted, and Informed Matrix
SMS	Short message service
TIN	Turkish identity number
TDWI	Data Warehousing Institute

1. INTRODUCTION

In this chapter, research problem, motivation of the thesis and chapters of the thesis are stated.

1.1. Research Problem

Global competitive market conditions force companies to create customer-centric strategies in order to do sustainable and profitable businesses. As Prahalad and Ramaswamy (2001) stated “Customers are no longer acting like passive buyers who only have a mission of consumption like in 70s and 80s; they are now members of a huge network which always helps them to find cheap, better and efficient products”. That is why; CRM and customer-centric strategies are more important than ever before in this decade. Especially in technology driven industries like telecommunication sector, competition and changing technology force organizations to focus on their customers more than other sectors. Also, quantity of customers and customer interaction points in telecommunication sector are more. Because of these reasons, CRM concept and customer centric strategies are more important and difficult for telecommunication sector companies.

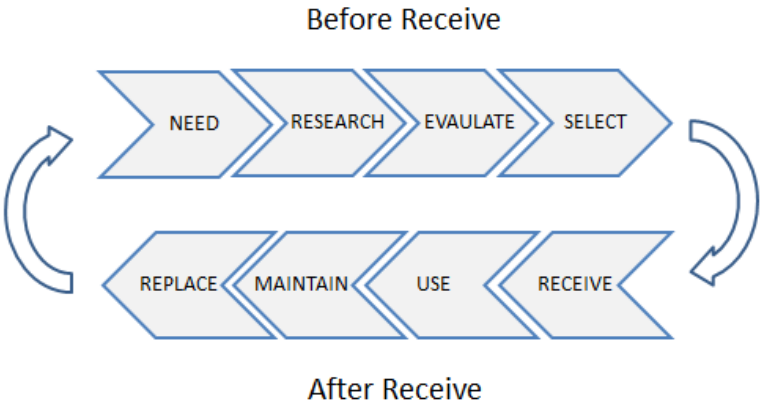


Figure 1: Customer Life Cycle

According to Gartner (as cited in Friedman 2009) new customer life cycle is as shown in Figure 1. This figure emphasizes the research, evaluation and selection phases that positioned after emergence of customers' need. As a result, customers do not receive products or services before research, evaluation and selection activities anymore.

As a result, CRM and customer centric strategies are very important and essential for companies. However, success ratio of CRM implementation projects is very low according to other IT implementation projects, especially for telecommunication companies. As Gartner stated (as cited in Everett, 2002) "Customers complain that more than 50% of their CRM projects have failed and the majority will underestimate costs between 40% and 75%". As Corner and Hinton (2002) stated, "Because of the nature of CRM projects, they include high risks and as the customer numbers, integration points and customer contact points increase, this risk also increase. Despite the availability of successful and more reliable technologies and companies' use of external skills that are recognized on technical level, managing CRM implementation projects remains as a risky undertaking".

CRM implementation projects are very important for telecommunication companies but the high failure rate shows that there is a problem about these projects that should be elaborated. Also a road map should be proposed which shows the critical and risky steps and preventive actions of failures.

1.2. Motivation of the Thesis

As stated at section 1.1, CRM is very important for today's market, especially for Telecommunication sector companies.

- However the failure rate of these projects is very high compared to other system implementation projects. Failure rate is higher specifically for Telecommunication sector than other sectors because of some sectoral specifications and difficulties. Telecommunication sector companies allocate big amount of their budgets for CRM implementation projects but mostly they cannot obtain the goals of these projects. As a result there is a problematic situation which should be analyzed. The main aim and motivation point of this thesis work is to analyze this high failure ratio.

- There is not a specific analysis made to find the failure reasons of CRM projects of Telecommunication sector. The other motivation of this thesis work is to make a literature analysis to find the failure reasons of CRM projects and separate specific Telecommunication sector failure reasons. Also, according to these literature analyses and opinions of sector expert, it is aimed to state the preventive actions of these failures.
- Also there is a lack of an extended road map to help Telecommunication companies to plan their CRM implementations. An extended road map can be very helpful for Telecommunication companies that emphasize the critical and risky steps and preventive actions for risks and failures. The last motivation of this thesis work is to propose an extended road map for CRM projects of Telecommunication companies. By the help of this road map, telecommunication companies can see the critical and risky points and preventive actions for every step of the project. As a result, this road map that proposed by this thesis work can be used as a reference document to increase the success ratio of CRM projects at telecommunication sector.

1.3. Chapters of the Thesis

This thesis is an outcome of an investigation and case study research that is prepared to find the failure reasons and difficulties about CRM implementation project at Telecommunication sector. Also, actions that should be taken to prevent these failures are mapped on a mostly used new system implementation project road map so an extended road map is proposed by this thesis work. The elaboration of road map that shows the critical points and preventive actions is validated by the help of analyzing two CRM implementation project from Telecommunication sector.

This thesis is formed by seven chapters. Content of these chapters are as follows:

- The first chapter is about research problem, motivation of the thesis and chapters of the thesis.
- The second chapter aims to state the general concept of CRM and specifications of CRM for Telecommunication sector and answer why CRM is indispensable for Telecommunication market. Also high failure rates of CRM projects at Telecommunication sector is stated by the help of clarifying objectives, KSFs (Key

Success Factor) and CSFs (Critical success factor) of CRM projects. This chapter is supported by literature reviews about the concepts and a wide frame of references related to the dissertation subject.

- Chapter three states the method of the thesis work.
- Chapter four analyzes the CRM implementation projects by the help of literature reviews, surveys with CRM experts and interviews with sector experts. By the help of these analyses, failure reasons and difficulties that should be focused on at CRM projects are stated. Also preventive actions of these failures are stated by the help of literature reviews.
- Chapter five states the new system implementation road map that is extended to shows critical points of CRM projects. CRM specific critical points and preventive actions of failures are stated on the new system implementation road map so the road map elaboration proposal is stated in this chapter. By the help of this proposed road map, critical and risky steps and preventive actions of failure reasons can be seen on the project steps.
- Chapter six is about validation of the extended part of road map by analyzing two CRM implementation project from Turkish telecommunication market. Accuracy of the road map elaboration is calculated by the help of some statistical methods. Also discussion about findings of these analyses is stated at this chapter.
- In the end of the dissertation, chapter seven represents the summary and future work of the thesis.

2. CRM CONCEPT AND TELECOMMUNICATION SPECIFICATIONS

Customer relationship management is an important concept of todays' market. In this chapter, firstly a general overview is stated according to literature reviews. Secondly, specifications of CRM concept of telecommunication sector and differences from other sectors are stated according to literature reviews. Lastly, success criteria of CRM projects are stated.

2.1. Customer Relationship Management: An Overview

It is clear that CRM operations are very important and popular in today's business world. Because of this reason; CRM concept is also popular at literature works. As Prahalad and Ramaswamy (2001), stated "Customers are not behaving like they used to do in 70s or 80s, with the help of internet and technology they are now a part of huge network which helps them to find better and cheaper products and services. Also CRM is becoming more and more crucial for organizations because of global competition and fast-changing market needs." CRM strategy is as important as a matter of survive at the new market conditions, as Mendoza, Marius, Pérez and Grimán (2007) stated, "Companies have a new trend to implement CRM as a factor that will allow them to survive in these new market conditions, favoring the relationship with their customers".

CRM is not only an IT system or a technological solution that can be regarded as a simple hard system; on the contrary CRM is a combination of hard and soft systems. Also as Chen and Popovich (2003) stated, "Customer relationship management is a combination of people, processes and technology that seeks to understand a company's customers". These concepts are very important for CRM successes in other words, it is difficult to imagine CRM as purely a technological solution. Because people and processes are important factors of CRM, management support is also an important element for CRM projects. It is not possible to manage the people and process change factors without effective management support.

For successful CRM implementation, it can be necessary to change the AS-IS processes that are not appropriate for CRM methodology and strategy. CRM can be regarded as a strategic decision and a methodology to increase the customer satisfaction level. CRM concept includes employees' attitudes towards customers, processes that are used among the companies and all the processes that touch to customers in any way. For example Brown (2000) defines CRM as a business strategic approach which helps organizations to understand, control and manage organizations' current and potential customers. Brown (2000) also stated that, "It is a strategic change whereby supports companies to better manage their own enterprise with customer-centric behaviors". Also Mendoza et al. (2007) stated that, "CRM is a strategy within the organization that aims to satisfy and create a long term relationship with the clients". Alt and Puschman (2004) stated that, "Implementing a CRM system is not mainly driven by the possible savings". According to a survey that was conducted by Alt and Puschman (2004), %55 of the benchmarked companies agreed that strategic or qualitative goals have been the main drivers for introducing CRM.

By the help of CRM and customer-centric strategies, companies can understand their customers' behaviors, profiles, habits and other variables that may help them to create value for customers. These values bring sustainable and competitive advantages to organizations in today's competitive business world.

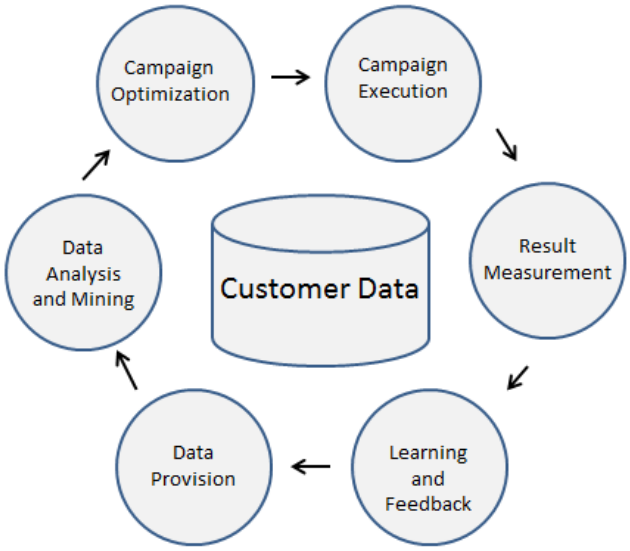


Figure 2: Main approach of CRM Applications (Foss & Stone, 2001)

CRM aims to create and support customer centric strategies. Figure 2 is a demonstration of applications of CRM that are supporting customer centric strategies. This situation is also supported by academic researches. For example, Reid and O'Brien (2005) stated, "CRM represents a new and increasingly efficient way for companies to understand and respond to customers' needs and preferences, allowing them to build more meaningful connections with consumers than ever before". Also as Baltzan, Philips and Haag (2006) stated, "CRM can be regarded as a decision-support system and approach for companies which want to create customer centric strategies and know customers better".

CRM has two main components which are Operational CRM and Analytical CRM. Baltzan et al. (2006) stated that, "These components help companies to analyze their customer`s behaviors, profiles and other assets right and fast, in order to create better customer-centric strategies". Operational CRM supports companies' daily operations such as call center and contact point operations. General goals of operational CRM are to increase the customer satisfaction and operational efficiency. Analytical CRM focuses on data interpreting and creating strategic decisions about future actions. Operational CRM supports traditional transactional processing for day-to-day front office operations and systems that deal directly with the customers. Baltzan et al. (2006) stated that, "Analytical CRM supports back-office operations, strategic analysis and includes all systems that do not deal directly with the customer".

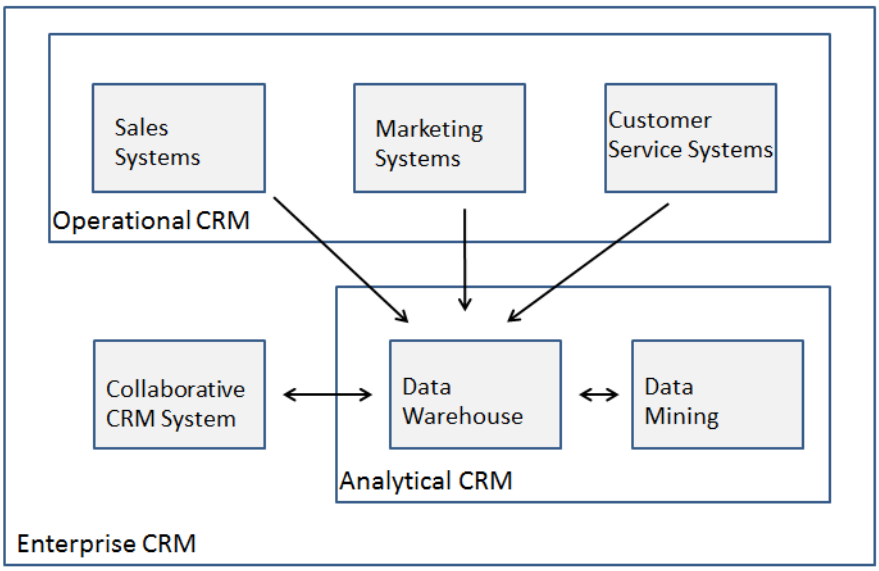


Figure 3: Enterprise CRM (Operational & Analytical) (Baltzan et al., 2006)

Figure 3 shows the general contents of analytical and operational CRM and relationship between these contents. Analytical CRM is fed by operational CRM modules and create necessary reports and knowledge.

2.2. CRM Specifications for Telecommunication Sector

According to Gartner (as cited in Friedman 2009), Telecom sector is taking advantage of CRM mostly in creating customer-centric strategies. Telecommunication sector companies have many processes that affect their customers and contact points that their customers interact with them. Also customer quantity of telecommunication companies is very big so it is difficult to handle, so CRM systems are becoming more crucial for Telecommunication companies to manage this huge data about customers. CRM is essential for service industries such as telecommunication and banking because without CRM it is not easy to know about customers and create value for them. Also for service industries, requirements of customers can change very frequently and also technology of these industries can change very fast so taking action as quick as possible is important for service industries.

Table 1: CRM Differences for Telecommunication Sector

CRM Concepts	Telecommunication Sector	Other Sectors
Customer Contact Points	Should support all technologically available contact points	Except banking sector, limited contact points
Customer Volume and Segmentation Necessity	Because of high customer volume and campaign management, segmentation is very important	Except banking sector, low customer volume and less important campaign management, less important segmentation
Churn Rates	Easy switching processes between competitors and high churn rates	More difficult switching and lower churn rates
Campaign Necessity	Dynamic and important campaign management	Except banking sector, less important campaign management
Customer Data Volume	High customer data volume	Respectively low customer data volume
Integration	Varied integration points with lots of legacy systems	Respectively less integration points and legacy systems
Customer Processes	Varied processes that touch to customers and should be managed by CRM	Except electricity sector, less customer related processes
Customer Profile	Technology addicted and conscious customers that have accessibility to information easily	Respectively more stable customers

CRM systems and CRM implementation projects for telecommunication sector differ from other sectors for some aspects. Actually, CRM projects and contexts of these projects differ for all sectors in some specific aspects. These differences occur because of general concept of processes and customer profiles of sectors. The goal of this thesis is to focus on CRM projects of Telecommunication sector, because of this reason; it is necessary to state these specific aspects for telecommunication sector. These specifications are stated at Table 1 and details of these specifications are detailed in the following sub sections.

Customer Contact Points: Telecommunication sector is a technology driven sector. Not only companies but also customers are generally interested in technology so they are expecting to complete their all transactions by the help of technology. Telecommunication companies should be accessible from all possible channels such as smart phone applications or SMSs (Short message service) and should respond to their customers from all possible channels.

Not all sectors are technology driven as telecommunication sector, and not all companies need to support all contact points as telecommunication companies. Telecommunication companies should support all channels that are technologically available. The up to date list of the contact points that are technologically available are as follows:

- Call center
- SMS
- E-mail
- Online transaction center
- Smart phone application
- Offices
- IVR (Interactive voice response)
- Fax

Contact points are in the domain of CRM so Telecommunication companies that implementing CRM should focus on all of these contact points and should support all processes at these points. Also every customer contacts at these points should be recorded for future analyses and customer satisfaction processes.

Customer Volume and Segmentation Necessity: Customization and loyalty programs are important issues of CRM systems. As Chen and Ching (2002) stated, “The objective of customization is to provide tailor-made products/services that appeal to and more precisely

fit the individual customer' s needs and this requires soliciting customers for their feedback and integrating this information into the production processes such that it provides the organization with its greatest competitive advantage. CRM was invented because customers differ in their preferences and purchasing habits. If all customers were alike, there would be little need for CRM". As McKim and Hughes (2000) stated, "Mass marketing and mass communications would work just fine". For companies as Telecommunication companies that have lots of customers, segmentation is an important part which means grouping the customers according to their specific characteristics because customization for every single customer is not possible. Because of this reason companies try to segment their customers to offer them more suitable products or campaigns. For successful segmentation, companies should know about their customers as much as possible and that means analytical CRM and data gathering about customers are very important aspects of CRM systems.

Segmentation is not necessary for all sectors because not all sectors have as much customers as telecommunication companies. Also not all sectors need to offer customized products or campaigns for example at energy sector, companies do not offer customized products or campaigns to their customers. They can offer just standard packages and they act as monopoly so in spite of their huge customer numbers they do not need segmentation or campaign management.

Campaign and package variety of telecommunication sector is significantly more important than other sectors. Proportion of telecommunication advertisements at TV channels is higher than other sectors, every day a new package or campaign is advertised by telecommunication companies. By the help of segmentation and customer usage analyses, all of these campaigns and packages can be created and offered to the appropriate segments.

Churn rates: At technology driven sectors, customers are more powerful and more flexible about changing the service or product providers. Also at telecommunication sector, competition is supported by government. At telecommunication sector, switch process between services providers are developed because of the governmental regulative obligations. The aim of government is to support the competition at Telecommunication

sector. Therefore, telecommunication companies should create churn and customers retain processes.

For GSM (Global System for Mobile Communications), fixed line and internet provider companies, switching between companies takes only 3 days and application process only takes a few minutes. Also customers do not need to pay any fee for this process. However, for other sectors, switching is not easy as telecommunication sector and it is not possible to complete this switching process without time loses or fee. Also for some sectors, switching is not possible because of monopoly structures. For example in Turkey, customers cannot change their electricity provider.

Campaign Management Necessity: Campaigns are generally necessary for all sectors to increase the consumption amount and attract customers but for telecommunication sector campaign management is more aggressive than other sectors. Campaigns should be in the market in a short time due to the marketing strategies. Because of these reasons, for telecommunication sector, campaign management process should be designed as flexible as possible. Campaign management process should be supported by segmentation and analytical CRM which analyses customers' related data. Without segmentation and analytical CRM, it is not possible to create appropriate campaigns. By the help of analytical CRM, telecommunication companies can determine the expectations of the customers and create campaign content appropriately.

Telecommunication companies present a new campaign almost every day to the market. Companies should be ready for strong competitive environment by the help of campaign management. Also CRM should support campaign management from all contact points, so companies should offer all campaigns from all contact points. For example, if a product such as laptop or a mobile phone is offered with a campaign, the company should take the campaign application from the web and also should transport the product to the address of the customers by the help of cargo integration.

Campaign rules can be various. Because of these rules, the integration points of CRM system also increase, for example for checking the debt situation, CRM should integrate with collection system or for product delivery CRM should integrate with the system of Cargo Company.

Customer Data Volume and Cleansing: Data cleansing is the most important part of the analytical CRM. For correct analyses, data should be correct and clean. Data from legacy systems should be transferred to CRM system after cleansing and correction processes. Also new data records should be controlled and checked by the necessary controls and rules to keep the CRM data clean and correct.

As the data volume increases, the data cleansing process gets difficult and the time of the process increases. Data cleansing is the preliminary part of the CRM project work so for successful CRM project, companies should care about data cleansing. For successful CRM, data migrated from legacy systems should be cleaned; otherwise it is very difficult to clean the data when CRM system is at production environment.

Data cleansing is an important process for all sectors but telecommunication companies have a huge amount of data about their customers and also they have lots of processes that touch to their customers. Data cleansing and data migration from legacy systems for telecommunication companies is more difficult according to other sectors. As stated by Friedman (2009), "Clearly, the challenge of managing the complex data quality issues involved has been raised as a potentially important factor affecting the successful outcome

of CRM efforts". In fact, according to Kaila and Goldman (2006), more than half of the CRM projects are failing because of the complex data quality issues involved. Data and information is an important factor of CRM, so data cleansing and data quality is an important factor especially for companies as telecommunication companies that have complex and huge amount of data. Also at the literature reviews there is a general belief that CRM implementation projects are influenced by three key factors which are organizational, technical and data quality factors.

Integration: By it is nature; integration points of CRM system are various. As Thompson (2004) stated, "Companies that get the most value out of their CRM programs viewed CRM as one strategic initiative and worked hard to integrate functions across marketing, sales and service to generate a 360-degree view of the customer". Because of this reason, to reach all necessary data about customers, CRM system should be integrated with all relevant systems such as collection system, rating and billing system and so on. If the integration architecture is not planed appropriately, processes can take long time or defect

ratio can be troublesome that users cannot complete their transactions. Because of these reasons, integration is very important for IT (information technology) systems especially for CRM. Integration points and architecture structure should be planned correctly and tested in detail.

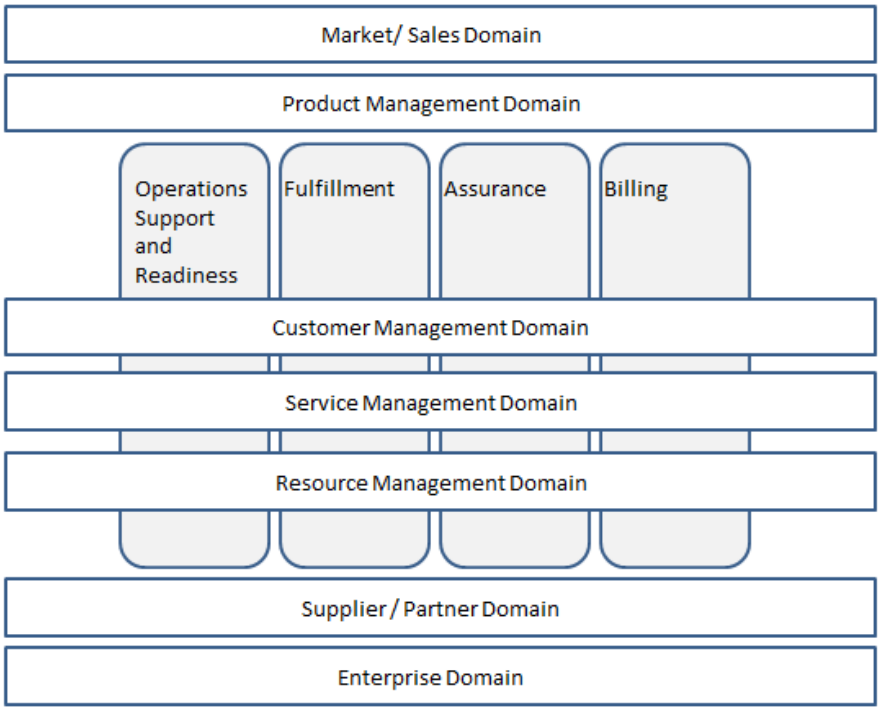


Figure 4: General Telecommunication integration infrastructure

At telecommunication companies, there are lots of processes and systems that should be integrated with CRM system such as billing, rating, collection, field operations, and so on. Because of this reason, integration is more important for telecommunication sector for successful CRM implementation. A general system integration infrastructure for telecommunication sector is shown at Figure 4. As can be seen from the figure, there are various domains such as operations and support, assurance, billing and fulfillment that customer and service management domains (domains that are managed by CRM system) should interact and integrate with.

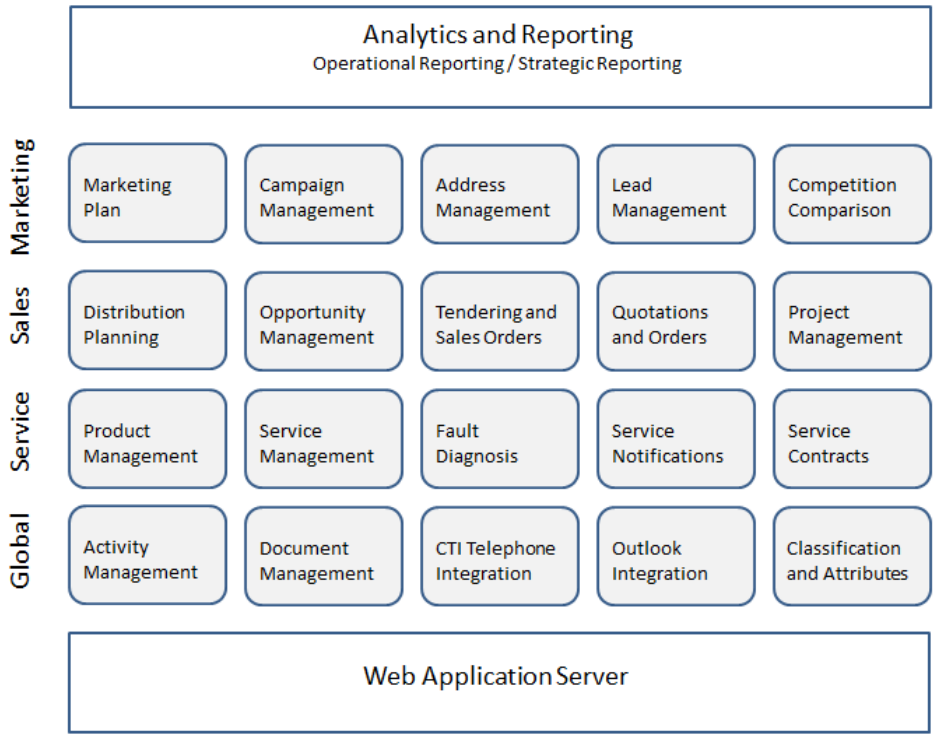


Figure 5: CRM System Modules

Customer Processes: At telecommunication sector, there are various processes that affect customers directly that managed by CRM. There are various CRM modules as shown at Figure 5. Telecommunication companies generally need all of these modules, because they have various customer processes that should be managed by CRM system. For example campaign management is one of these modules that are very important for Telecommunication sector. Segmentation and risk management is another example of these modules that can be stated as other important modules of CRM system for telecommunication companies. Number of modules that is needed to be implemented for CRM implementation projects of telecommunications sector is more than other sector. Because of this reason, CRM project is more time confusing and difficult for telecommunication sector. Difficulties and failure ratio of CRM implementation projects also increase respectively.

Customer Profile: Telecommunication sector customers are more conscious about services they take because they are generally technology addicted and internet users. By the help of

internet, they can reach to the most advantageous packages and campaigns. Also because of governmental regulations that support competition and switching between companies, customers can easily switch between companies. By the help of internet, customers can easily search about telecommunication services, packages and campaigns. They can select the most advantageous combination and in about three days, they can easily switch to a competitor company that offers the best option.

Because of customers' profile and sectors' conditions, some sectors are more appropriate for CRM usage and they can create more value by the help of CRM systems. Harvard Management Update (as cited in Ranjit 2002) identifies companies who are most likely to benefit from CRM and those are less likely:

- Most likely to benefit are companies who "accumulate lots of data on each customer's buying patterns in the course of their business"; for example, financial or telecommunication companies. Clearly, a key component to CRM is lots of information about the company's consumer.
- Least likely to benefit are businesses where the consumer is not in contact with the marketers, where the lifetime value of a customer is low, or business with huge customer churn.

2.3. Success Criteria for CRM Projects

Successes ratio of CRM projects are significantly low, generally companies cannot attain advantages of CRM or cannot use the system as they planned. As Zhedan, Hoyeon and Jongmoon (2007) stated, "In CRM implementation projects, two kinds of situations can be regarded as failure. One of these cases is where the adopted CRM system has been used for less than 6 months. This can be considered as a total failure because it wastes efforts and money and there is no return on the investment. The other case is where the CRM system does not meet the initial expectations". According to IDC (International Data Corporation) and Hagemeyer and Nelson (2003), the rate of successful CRM implementation is below 30%. Also according to King and Burgess (2005), large scale integrated systems are by definition complex and difficult to implement.

What are the success criteria for CRM projects is an important point. Understanding the success or failure criteria is important because this enables analyzing the situation and reasons of this high failure rates. Normally, project success criteria are time, cost and quality. However by its nature, there are some other success criteria for CRM projects. CRM is not just an IT based project but also a strategic action which aims to understand the customers and offer them appropriate products or services. As a result, in the long run, CRM aims to increase the customer satisfaction ratio, competitive advantage of the companies and profitability. As Kim and Kim (2009) stated, "Since CRM is an IT enabled business strategy rather than as IS (Information System), previous IS success models are insufficient to indicate whether a company's CRM initiatives have succeeded or failed and why". As King and Burgess (2005) stated, "An effective CRM system should enable an organization to gain greater in to customer behavior and preferences". As Chang, Liao and Hsiao (2005) stated, "Traditional dimensions of performance measures are usually finance based. When it comes to customer relationship, however, more measures should be related to customer perspectives". CRM results can be obtained in the long run, so it is important to focus on long run results. As Bose (2002) stated, "The biggest threat to CRM is managements' focus on short-run profits rather than long term vision".

CRM is an expensive, time consuming and complex proposition. Sauer, Southon and Dampney (1997) provides a useful definition that moves the failure definition of information system project away from the commonly used concepts of time and budget overruns and defects. According to them, failure has a strong social dimension in addition to time, cost and defects dimensions. CRM is not only a technological solution, it should also involve employers so social dimension is an important factor for CRM success. As Gefen and Ridings (2002) stated, "In order to successfully embed CRM, system users should be involved and their expectations should be managed". As Swift (2001) stated, "Business processes need to be changed as well as technology, so not only users or human factors but also processes should be focused as evaluation criterion of CRM project". Time, cost and quality are the criteria that give idea about the project in the short run but general goals of CRM system can be observed in the long run.

Understanding the goals of CRM projects is the key point to clearly understand the success and failure of CRM projects. If the companies can obtain the goals of the project and assure

the time, cost and quality criteria in limits, it can be regarded as a successful implementation project. As Chang et al. (2005) stated, "If the goal is to evaluate the impact of CRM initiative, which seeks to improve customer relationships, any measure of results must also include the perspective of the customers". As Kim and Kim (2009) stated, "A company should first define an appropriate CRM strategy matching its enterprise wide business strategy, then select CRM measures to assess its CRM strategy, and finally cascade those through the organization".

Table 2: Goals of CRM projects

GOALS/SUCCESS CRITERIA	METRICS/METHODS FOR MEASUREMENT
G1: Increase customer satisfaction	Customer satisfaction surveys
G2: Increase sales efficiency and productivity	Sales volumes of new products and campaigns
G3: Improve customer loyalty	Customer satisfaction surveys and churn rates
G4: Provide a strong communication channel with customers	Customer satisfaction surveys about communication channels
G5: Enable opportunity to meet with new customers and businesses	New customer acquisition rates
G6: Decrease overall customer care expenses	Call center efficiency rates and decreased operator numbers
G7: Increase profitability	It is difficult to measure directly, it can be interpreted by the help of financial situation of company
G8: Enable better order management	Sales volume rates of self-order channels and order distribution intervals
G9: Increase call-center efficiency	Call center efficiency rates and decreased operator numbers
G10: Allow good experiences to customers in every contact with the organization	Customer satisfaction surveys
G11: Provide information and analysis about market trends	Successful strategy determination rate
G12: Provide customer profile data	Accessibility rate of customer data from all relevant channels and points
G13: Avoid time wasting in customer interaction	Overall customer care expenses
G14: Enable better profiles, target groups and segments	Customer loyalty level and campaign sales numbers
G15: Increase market share	It is difficult to measure directly, it can be interpreted by the help of financial situation of company

General goals/success criteria of CRM projects and metrics/methods for measurement of these goals and success criteria are given as a list at Table 2. There can be slight differences between goals of companies because strategic decisions can affect them. To understand

the success and failure of CRM projects clearly, goals/success criteria and metrics/methods for measurements of these goals are analyzed in detail in the following sub sections.

G1-Increase customer satisfaction: The main goal of the CRM projects is to increase the customer satisfaction ratio. Successfully planned and implemented CRM systems should increase the customer satisfaction level but by its nature, this issue can be tracked after the implementation of the system. In the short run, it is difficult to measure this factor. CRM is a strategic decision and factors as this one can be measured in the long run. Customer satisfaction level can be measured by the help of customer surveys. This goal supports some other goals indirectly, so by the help of these goals that supported indirectly, customer satisfaction level can be interpreted.

Customer satisfaction level should be monitored permanently; this is a necessity to take action in a short time in case of a customer satisfaction level decrease. Companies should create monitoring solutions not only to measure the success ratio of CRM project but also to take necessary improvement actions in a short time. After implementation of the system, if there is not a significant increase about the customer satisfaction level, there should be something wrong about CRM project and it is difficult to regard the project as successful.

G2-Increase sales efficiency and productivity: The main goal of analytical CRM is to analyze the data of customers and create meaningful knowledge about customers. By the help of this knowledge, sales and marketing teams can create more advantageous and profitable products, services or offers for the customers that result with increased sales efficiency. Prospect customers for the products, services and offers of the company easily can be determined by the help of customer data analyses. If the analytical CRM is appropriately planned, implemented and correctly used by the company, sales efficiency of the company can be improved in the long run. Sales volumes of new product or campaign are the most useful indicators for this criterion.

G3-Improve customer loyalty: CRM systems aim a win-win relationship between customers and companies. For sectors where switching between companies is so easy, companies should offer the best solutions or products for the customers and customize their processes as much as possible for their customers. Companies should make their customers feel

special by the help of customization and loyalty programs. Without loyalty, customer churn rate can be very high because there are lots of competitors at the market and customers can find any other company which has more profitable offers for them. Also without loyalty, it is not easy to compete only with price advantages. For some customers, loyalty programs and special offers are more important than price advantages. Companies should create the image of thinking about their customers and should be able to offer them special products, services or campaigns. Loyalty is possible with analytical CRM solutions, by the help of analytical CRM; companies can increase their knowledge about their customers and can offer special products or services to them.

Customer loyalty level can be monitored by the help of surveys and churn rates and if there is not a significant improvement about customer loyalty, there must be something wrong about analytical CRM or supporting processes.

G4-Provide a strong communication channel with customers: Customer communication channels are important for CRM because they are contact points of the company with the customers. Also companies should create and provide all necessary contact channels with customers. All contact points should be supported with necessary data and processes so there should be consistency between these points and they should use the same data about the customers.

As Chang et al. (2005) stated, "Degrees of channel integration can also be a good indication on CRM performance. Channel management refers to coordinating and synchronizing communications across separate customer touch point systems, and requires that all channels be fully integrated. Channel management produces an effortless sharing of knowledge about a customer's relationship with enterprise."

By the help of contact points, companies can get information about customers. CRM system should support these points to obtain all necessary data about customers and create effective information by the help of these data. Especially for technology driven companies, there are many customer contact points that are necessary. One of the main goals of CRM is to create a single system and database that can be accessed from all contact points. The indicator of this criterion is observing the customers' satisfaction ratios.

Without successfully implemented contact points, CRM system cannot be regarded as successful.

G5-Enable opportunity to meet with new customers and businesses: CRM systems should support prospect customer management because not only existed customers but also prospects customers are important for companies. Generally, acquiring new customers is more difficult than retaining existing ones and CRM system should support both of them.

CRM systems support new customer acquiring processes by enabling creating prospect customers and assigning these prospect customers to appropriate sales teams. Also CRM systems support performance evaluation of sales teams according to prospect customer acquisition. CRM systems record all necessary data about prospect customers and should use these data for prospect customer acquisition processes.

This criterion can be measured by the help of new customer acquisition rates.

G6-Decrease overall customer care expenses: CRM system is not only an IT system solution but also a strategic decision which aims to improve the general customer care processes and increase the efficiency of these processes. By the help of CRM system, most of the customer oriented processes can be automatized, for example from the web channel or Call Center IVR channel; customers can manage their operations themselves without any operator. Also at the customer centers where agents are employed, customer operations do not take as much time as before. By the help of CRM system, agents can reach all necessary data from a single screen and can complete operations of the customers in a short time that increase the efficiency at the contact centers.

However, if the system is not implemented correctly and if there are integration failures, at customer contact centers, employee efficiency can be reduced because of system delays that caused by integration problems. As a result, successfully implemented CRM systems decrease overall customer care efforts of the company by the help of automatized processes and increased agent efficiencies so overall expenses of customers care is decreased.

Agents' efficiency rates can be viewed by the help of call center systems that create detailed analyses and reports. Also in the long run, general expenses of customer care should be reduced such as employed operator numbers.

G7-Increase profitability: Profitability of a company is a general concept which can be affected by many parameters. Successful CRM system implementation is also one of these parameters that can affects profitability of the company positively. In the long run, CRM system can increase the profitability of the company but because there are many other parameters that affect this goal, it is also difficult to measure CRM success by the help of this criterion.

G8-Enable better order management: Orders are triggered from the contact points on the CRM system and by the help of integrations, orders can be transmitted to the related systems. CRM systems aim to easily create orders to decrease the order handling time and customer satisfaction rate. CRM system supports all transactions from all contact points, orders are also one of these transactions. Especially for technology driven sectors, customers want to give an order easily and remotely, for example from the internet or smart phone applications.

CRM systems should support order management processes and necessary integrations with the other legacy systems.

G9-Increase call center efficiency: Call centers are the most important contact point of the companies because they are the easiest and most preferred contact point. Companies generally spend huge amount of money for call centers. Companies employ lots of agents for call centers and they generally should serve for 7/24 which increases the expenses.

As mentioned in the decrease overall customer care expenses part, successfully planned and implemented CRM systems increase the efficiency of the contact points and decrease the expenses. Because call centers are the most preferred contact point, this situation is also standing for call centers.

G10-Allow good experiences to customers in every contact with the organization: CRM is not just an IT solution and system and it is not only a hard system but also a soft system so it also includes people and human factors. Customer satisfaction can be increased by the

help of CRM system. However, if the agents or employees at the contact centers do not behave in convenient with the strategy of CRM, experience of the customers at these points can be catastrophic. Actually all employees of the company are a contact point of the companies, so every employee should be adapted to the CRM strategy. Without support of employees, IT system singly cannot create a good experience.

Customer experiences can be observed by the help of questioners that made with customers. If the strategy of CRM cannot be expanded overall of the company, customer experience criteria cannot be improved significantly. CRM should be regarded not only an IT and hard system, but also a strategic decision and soft system.

G11-Provide information and analysis about market trends: Analytical CRM not only focuses on current customers and their trends but also focuses on general market trends. CRM system supports marketing departments by the help of analyses of analytical CRM. Marketing departments can create new campaigns and new products according to current customers and market trends. Benefits of analytical CRM are generally observed in the long run because they generally create improvements about strategic decisions and strategic decisions are generally made for one or two years horizons.

Companies generally create their road maps for one year horizon about marketing strategies that affect their new products and services. They distribute their financial assets according to these strategic decisions and generally changing these decisions are not easy. Because of these reasons, analytical CRM and market trend analysis are very important for the companies and also they are not easily observed in the short run.

G12-Provide customer profile data: This is one of the basic goals of CRM systems. CRM systems record all necessary data about customers and support every contact points and employees with customer profile data. This criterion can be easily observed and tested in the short run.

G13-Avoid time wasting in customer interaction: As mentioned at the “Increase call center efficiency” part, CRM systems increase agent efficiencies and decrease the time wasting in customer interaction points because system automatizes most of the processes and also agents easily reach the related screens and information from the system as a result serving

to the customers gets faster. This criterion can be observed in the long run by the help of overall customer care expenses.

G14-Enable better profiles, target groups and segments: Profiles, target groups and segments are important factors for companies that have many customers such as telecommunication companies. To increase customer satisfaction and loyalty, customization is very important. Loyalty is one of the main goals of CRM systems so customization is very important but also very difficult to obtain. Especially for companies that have lots of customers, companies cannot customize their products or services for every single customer, because of this reason companies try to create segments and profiles for customers that have similar properties. Determining these properties and segments of customers are important because companies generally create and offer their products, services and campaigns to their customers according to their segments. If segmentation is not made effectively, marketing and sales activities cannot be successful and also companies cannot increase the loyalty and customer satisfaction level.

Segmentation is one of the analytical CRM responsibilities. Successfully planned and implemented CRM systems can create successful segments and as a result successful campaigns and package offers for the customers. Success of this criterion can be observed by the help of customer loyalty level and campaign sales numbers.

G15-Increase market share: Market share of the company is a very general term and affected by many factors. Successful CRM systems affect market share positively but measuring the success of CRM implementation from this criterion is not easy so this is not a good indicator for determining success of CRM implementation.

3. THE METHOD

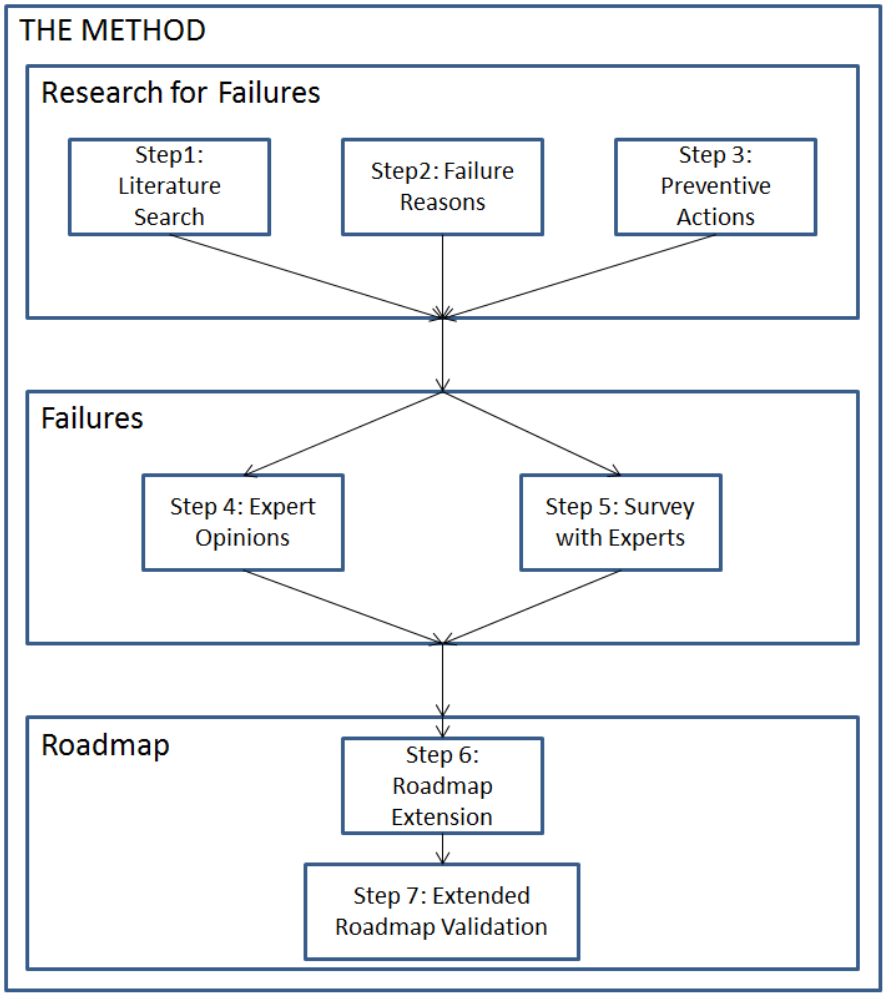


Figure 6: The Method

CRM is very important for companies especially for Telecommunication sector companies. Companies devote high proportion of their budgets for CRM projects but failure rates of CRM projects are significantly high. The aim of this thesis is to propose a road map that emphasizes the critical and risky steps and preventive actions of failures for CRM projects at Telecommunication Sector. For this purpose, the method that is stated in Figure 6 is used.

Steps of this method are stated in the following sub sections.

Research for Failures:

Step1: First of all, by the help of literature search, general concept of CRM is stated. The aim of this thesis work is to analyze CRM projects of Telecommunication sector, because of this reason; telecommunication sector specifications are also stated in this step.

Also objectives of CRM projects are clarified to understand and interpret the failure reasons of CRM projects. This step is covered in Chapter 2.

Step 2: In this step, high failure rates of CRM projects and reasons of these high failure rates are analyzed. According to this analysis, reasons of high failure rates are specified. According to literature, failure reasons are generally grouped in three sub groups and these reasons also analyzed in these three sub groups at this thesis work. These sub groups are process, human and technology. Failure reasons are stated by the help of literature works and real sector examples. This step is covered in section 4.1.

Step 3: Preventive actions for these failures are specified by the help of literature search. For every failure reasons, preventive actions are stated in this step. Preventive actions are necessary for road map creation because these actions are mapped on the project road map that is proposed by this thesis work. This step is covered in section 4.1.

Step 4: After specifying the failure reasons according to literature reviews, opinions of experts from Telecommunication sector of Turkey are taken. By the help of opinions of experts, it is displayed that literature and experts opinions are agreeable about failure reasons of CRM projects. As a result, it can be commented that, literature and real sector are agreeable. This step is covered in section 4.2.

Step 5: Failure reasons that are stated according to literature review are graded by the help of survey that are made with sector experts. By the help of this survey, it is shown that grading of sector experts and literature work density is parallel. This survey also shows that literature works and opinions of experts are parallel. By the help of result of this section, importance levels of failure reasons are interpreted according to grading. This step is covered in section 4.3.

Roadmap:

Step 6: Preventive actions of failures and critical points of CRM projects are stated on a standard new system implementation roadmap. The road map that was stated by Turner (2008) was used as standard implementation project road map. The aim of this roadmap is to highlight the risky and critical steps of CRM projects and to show the preventive actions that should be taken at these steps. Preventive actions were separated in two groups as CRM specific and non CRM specific actions. According to this separation, two road map elaborations were created, one was for CRM specific and one was for non CRM specific actions. As a result, at the end of this step, a road map elaboration is proposed for CRM projects of Telecommunication sector, which is the main motivation of this thesis work. This step is covered in chapter 5.

Step 7: After proposing the road map elaboration, to validate the extended roadmap, two CRM implementation projects are analyzed. These projects are from Telecommunication sector of Turkey. The aim of this analysis is to validate the proposed road map elaboration. By the help of this analysis, some statistical analyses are made to calculate the validity and confidence level of the roadmap. This step is covered in chapter 6.

4. REASONS OF FAILURE

Up to this point, what CRM is, what the differences of CRM projects at telecommunication sector are, high failure rate of CRM implementation projects and success criteria of CRM projects are studied. The aim of this chapter is to analyze the reasons of high failure rate of CRM implementation project at telecommunication sector by the help of literature search, interviews and questionnaires that are made with telecommunication sector professionals. According to these analyses and interviews, a check list is created that includes the critical and risky steps of CRM projects. Also preventive actions of these failures and risks are stated by the help of literature search.

4.1. Failures in Literature

CRM projects can be named as techno change projects. As Markus (1983) stated, "'Techno change' refers to the use of new IT applications along with organizational changes. The objective is to improve companies' global performance. Using IT strategically to bring about organizational performance is fundamentally different from both IT projects and organizational change programs. Unlike IT projects, which focus on improving technical performance, 'techno change' involves great potential impacts on the users, processes, and organizational performance". CRM is not just a technological solution; it is also a strategic decision.

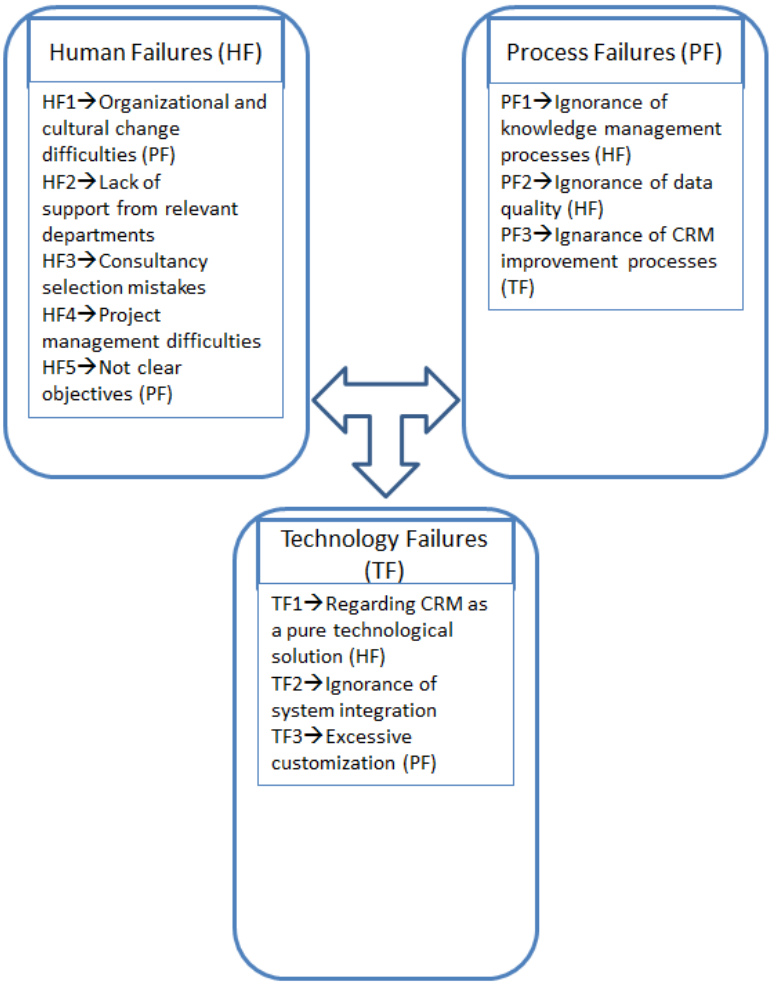


Figure 7: Failure Reasons

According to literature, CRM should include three important aspects that emphasize the strategic nature of CRM projects. These three aspects are human, technology and process. Failure reasons can be grouped in these three aspects. Failure reasons of these aspects are stated at Figure 7. Some failure reasons can be related with more than one aspect but one of them is stated as main aspect and these failure reasons are stated under these main aspects. Aspects that related with failure reasons other than main aspect are stated in parenthesis at the figure. These three aspects are like the legs of a tripod so without one of them, a successful and manageable CRM is not possible. CRM systems are not magical technological tools; technological part of CRM should be supported by other factors to create all aimed goals. The details of these three aspects are stated in the following sub sections with the following order:

- Human
- Technology
- Process

4.1.1. Human

Companies cannot serve to their customers only just with machines or computers without their employees, so in any way customers contact with employees. Companies can have all technological devices and software but if the end users do not use them appropriately they cannot create value for customers and companies.

The attitude of employees or agents is very important because it can radically change the customers' opinions about the company. According to a study done at Harvard Business School (as cited in Mendoza et al. 2007), overall quality of the service provided by a company is directly related to the customers' satisfaction level with the services provided by the customer service staff. This confirms the importance of the relationship established between the customers and the company, via the company's employees.

CRM concept should be adapted by all employees because directly or indirectly, all employees can affect customers' opinions about the company. If the aim of the company is to increase the customer satisfaction, all employees should be careful about this aim. This necessity is not only for end users or low level employees but also for managers and executives. As Mendoza et al (2007) stated, "In CRM strategy, it is vital that all levels of the organization be aligned toward favoring the relationship with the client, taking into account all of the implications of this objective".

The main mistake about human factor at CRM projects is not focusing on awareness of employees about the CRM concept and responsibilities of them about this concept. As for every strategic decision, employees should also be informed about the aim of the CRM project and the changes on their routines that is caused by the project. As Mendoza et al. (2007) stated, "Human factor is critically important, since even with the best defined processes and most advanced technology the relation between people still has a determinant role in the implementation of any business strategy". According to an investigation at a telecommunication company (as cited in Beldi, Cheffi and Dey, 2009),

"The change management director observed that only 10% of sales people are using the application regularly, and the peak of connection was observed at the end of the month, in order to enter the sales figures".

Human factor not only include the end users but also IT staffs too. Henderson and Venkatraman (1994) suggest that; "An organization's IT infrastructure has two components: (1) a technical IT infrastructure and (2) a human IT infrastructure". Duncan (1995) sees the technical IT infrastructure as a set of tangible, shared physical IT resources that form a foundation for various business applications. Tangible IT resources include hardware and operating systems, network and telecommunication technologies, data, and core software applications. In contrast, the human IT infrastructure addresses the necessary individual skills and knowledge required to develop, maintain, manipulate and support end users in their abilities to leverage the technical infrastructure.

4.1.1.1. Human Failures (HF)

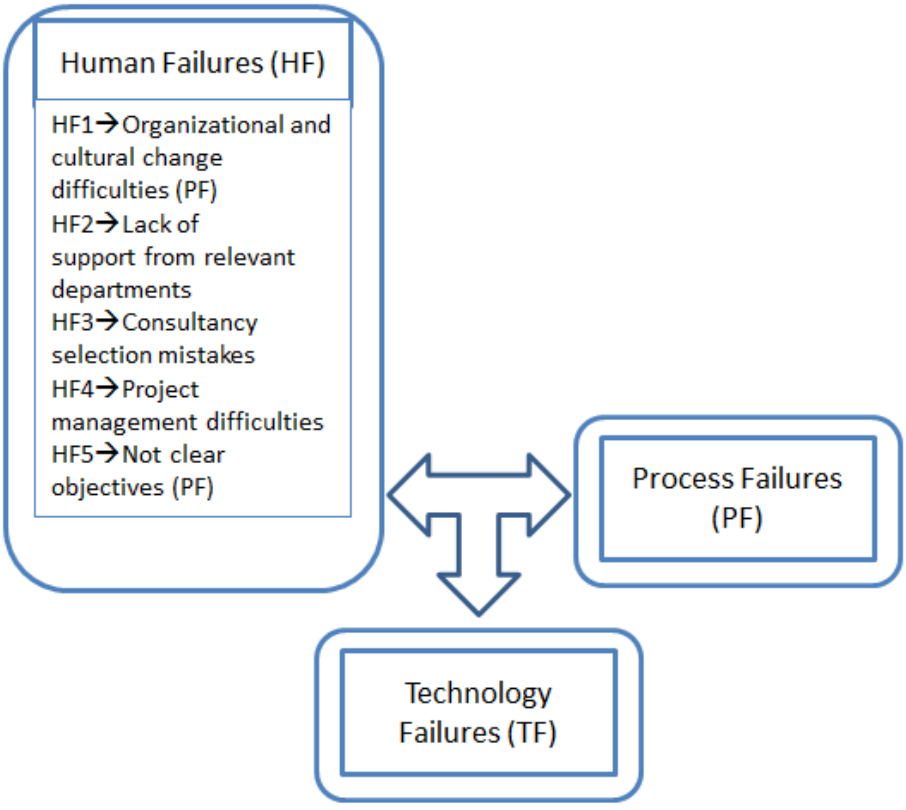


Figure 8: Human Failures

Main situation about Human factor is stated above; now specific failure reasons under human aspect that is stated at Figure 8 are analyzed. In the following sub sections, details of these failure reasons and also actions that can be taken to prevent these failures are stated. Action codes are stated in brackets at the related parts.

HF1 Organizational and Cultural Change Difficulties: CRM aims a customer centric organization that needs not only technological changes but also organizational, cultural and process changes. Processes that related with customers should be re-organized and revised according to CRM strategy and if necessary new processes should be created for customer centric strategy. As King and Burgess (2005) stated, "The organizational change associated with the implementation of integrated information systems takes places through an adaptation of the business processes, and a reconfiguration of the company's organizational structure". It is documented that most problems in CRM implementation are not technical. Instead, as Bygstad (2003) stated, "Common problems include organizational change and fluctuation. It is necessary to carry out changes in the processes as well as in the organizational structures and the management, in order to obtain benefits from the implemented CRM system".

Especially for telecommunication sector, customers have high negotiation and bargain power and they can lead business process changes of companies. CRM involves significant changes regarding the organization of marketing, sales and service activities. As Alt and Puschman (2004) stated, "Most companies reorganized internal processes and implemented them on a cross functional and cross-organizational basis". As a result, CRM project generally affect most of the departments and their routines, so it is important to informing all relevant parties about progress of the project to increase the adoption (**HF1-A5**). Organizational structure and human resource allocation are also affected by these changes, so the companies should also redesign these factors or should be able to make these changes. As a result, companies should manage the cultural change of the company according to CRM strategic goals (**HF1-A6**). Xu and Walton (2005) stated that, "The strategy, organizational structure and business processes all need to be transformed to implement CRM, since success in the initiative will depend on creating the right synergy between technological systems, processes and people." Generally companies do not attempt to make these comprehensive changes or give the authority to the project team to take the

necessary actions about culture and organizational changes. Generally, project sponsors are not powerful enough to give decision about these comprehensive changes so project sponsorship is very important. Companies should state the appropriate sponsors for the CRM project that can support and provide all these necessary changes (**HF1-A2**). CRM strategy needs a cultural change; attitudes of all employees should be changed according to CRM strategy. According to a study by Purdue University, the reasons of poor quality of services are lack of accesses to the right personnel (41%), inattentive personnel (26%), rude employees (20%) and slow responses (13%). As can be seen from this research, personnel of the company have an important effect on customer satisfaction level. As a result, CRM culture should be adapted and supported by whole company (**HF1-A1**). As Alt and Puschman (2004) stated, "Involving as many potential systems as possible is vital to the adoption of CRM within an organization. This not only refers to establish the necessary skills for operating the system but also refers to convince staffs that the system will be beneficial".

As Chen and Ching (2002) stated, "Without an adequate human IT infrastructure, the organization will realize very little benefit from its IT infrastructure and investments". In essence, the human IT infrastructure must shadow the development of a technical IT infrastructure. As a result for CRM projects' success, companies also should support the IT department and the qualification level of IT staffs. As a result, companies should create a competent IT team as soon as possible that is being planned to be responsible of CRM system operations (**HF1-A4**). Without a qualified and competent IT team, the success of a CRM project which is a complicated and troublesome according to other IT systems is not easy to achieve. Also IT team is an important factor for long term success of CRM system. CRM systems generally are created configurative to support new demands without change the general architecture of the system and configuration should be managed by the IT department, so IT department should be talented and sufficient to support these responsibilities. IT teams are very important, especially for telecommunication sector where conditions and necessities change very frequently. Because of these reasons, it is also important to create the project team that includes IT staffs as soon as possible to make them experienced about the CRM concept and CRM configurations (**HF1-A3**). Project team should work with the consultants as long as possible to learn the system configuration details and to be familiar with the CRM concept.

Companies should include organizational structure changes while planning CRM project and when necessary they should support these structure and process changes but generally companies do not venture these comprehensive changes.

HF2 Lack of Support from Relevant Departments: CRM projects are not only IT centric technological projects but they also include strategic changes that affect whole company. For a successful CRM project, all functional parts that directly or indirectly touch to customers should be integrated and should be redesigned according to CRM strategy. Companies generally act based on the product centric strategy but CRM strategy brings the necessity of customer centric strategy so most of the departments in the company should act according to this change and necessity. As Chen and Ching (2002) stated, "Product driven marketing, focuses on pushing end products into markets while promoting lower prices and good quality whereas market orientation concentrates on detecting and fulfilling customer needs quickly". As Chang et al. (2005) stated, "Market orientation practices have positive impacts on an organization's performance and new products, and promote customer centric values". As can be seen, scope or content of CRM projects is so wide. Without these changes, it is not possible to create a successful CRM system and CRM strategy. According to this aspect, top level management support is very important. For CRM success it is not enough only to include and gain the employees support but also top level management support is also very important. Top level management should know about the CRM strategy and necessary changes and also they should support these changes on the whole company. As a result, it is important to informing relevant top management and to take their approvals about the progress of the project (**HF2-A4**). Without their support, it is not possible to make the necessary process or cultural changes. Also it is important to take the approvals of all relevant authorities of the project. They should understand and approve the all changes and necessities about CRM and customer centric structure (**HF2-A2**).

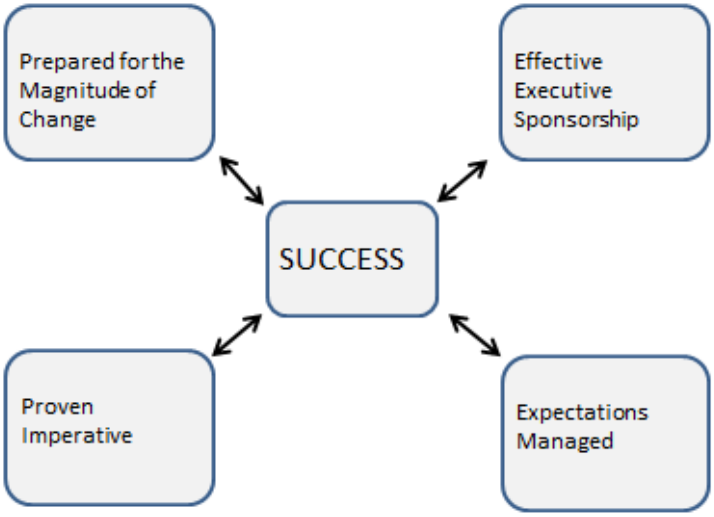


Figure 9: CRM Success Factors (Gartner (2009))

Gartner Reports (2009) shows four important success factors of CRM projects as shown in Figure 9. As can be seen from the figure, executive sponsorship is very important for CRM project success. According to King and Burgess (2005), critical success factors for CRM are stated below, which also emphasize top management support.

- Top management support
- Communication of CRM strategy
- Willingness to change processes
- Culture change / customer orientation
- Systems integration capability

CRM projects' steering committee should include top level management and also they should really take action in instead of being a passive steering committee member. As Markus (1983) stated, "The critical success factors for these projects are technical, organizational and managerial effectiveness". According to Bose (2002), Bygstad (2003) and Chen and Popovich (2003), keys of CRM success are the performance of all stakeholders concerned, communication, coordination and top management commitment. As a result it is important to create a communication plan with all relevant parties and managers (**HF2-A3**) to support coordination between departments and managers about CRM strategy. Companies must ensure they have the proper resources as well as support from all departments, especially from senior management.

Generally top management of companies see CRM projects as an IT and customer care department project, because of this reason other management members do not focus on

this project and also they do not support the decisions. As a result, not all necessary actions about CRM strategy can be taken. This situation results with an incomplete project and also with not achieved goals. As a result, authorities of the project should be stated at the beginning of the project that include not only IT and customer care department but also other necessary parties that affected by CRM project and customers centric strategy (**HF2-A1**).

HF3 Consultancy Selection Mistakes: Expertise is an important factor for CRM implementation projects because CRM is a relatively new concept for companies. Also for large scaled projects such as CRM, it is important to observe and analyze benchmarked solutions and methods to create the best solution for the company. Because of this reasons, big companies generally work with consulting companies for CRM projects (**HF3-A2**). Also, integration architecture is outsourced by the companies to vendor companies that are experienced about integration of large scaled projects. Selected vendors and consulting companies are important because by the help of their experiences, it is possible for the companies to train their employees about CRM concept. Because of this reason it is also important to include the necessary employees on the project organization as soon as possible and make the necessary plans about education and training.

Generally, IT teams of the companies are only large enough for routine IT operations so it is not easy to create a project team that is large enough for a CRM project with the existing IT staff. Because of this reason it is also necessary to include consulting staffs in the project. As Bose (2002) stated, "First, most companies have scaled back IT departments so implementation of a CRM solution is likely to require additional outside technical staff. Second, selecting experienced vendors or consulting companies to assist in the project will help to ensure project success by reducing common problems and prioritizing tasks".

The main problem about this issue is consulting company selection and agreement rules. According to a survey made by Alshawi, Missi and Irani (2010), vendor support dimension is the dimension that all the interviews from companies that started CRM implementation project, expressed some or high concern about and they were not totally happy with the level of service provided and they indicated that after sale service was too expensive and this cost was not clearly specified by vendors during the purchase process. As a result, appropriate vendor selection is very important and companies should care about

appropriate vendor selection (**HF3-A1**). It is very important to work with a consulting company that is familiar with the culture of the company, otherwise it is becoming very time consuming for the consulting company and also for the company to obtain this familiarity which is necessary for a successful project life cycle. Also the consulting company should be expert about CRM concept and CRM implementation project life cycle.

HF4 Project Management Difficulties: Project management is a general success criterion for projects. Without a successful project management approach it is not possible to complete the projects successfully. However, because of the nature of CRM projects, project management is more important. CRM projects not only include technical changes but also organizational changes that cause necessity of a prosperous project manager. As Beldi et al. (2009) stated, "Customer Relationship Management implementation projects reflect a growing conceptual shift from traditional engineering view of projects". Such projects are complex and risky because they call for both organizational and technological changes. For organizational and cultural change necessities, authorization is very important. Without necessary authorization, project manager cannot take necessary actions and force relevant parties to take necessary actions for project and customer centric structure (**HF4-A1**). As Corner and Hinton (2002), Bull (2003) and CSO Insight (2006) stated, "Despite the availability of successful and more reliable technologies, and companies' use of external skills that are recognized on a technical level, managing CRM implementation projects remain a risky undertaking". In fact, according to Winter, Smith, Morris and Cicmil (2006), the introduction of large scale integrated IS leads to more significant changes in processes, tasks and people than traditional computing projects. As a result, it is important to select an appropriate project manager or a management team that can manage both technical and non-technical issues of the CRM project (**HF4-A2**)

General project management success factors such as time, cost and quality can be regarded as project management success criteria. These criteria should be managed by project manager by the help of general project management tools and methods. Ahleman (2009) argues that the management of IS projects should no longer focus solely on scheduling and resource management. In the case of CRM implementation projects, the technical variables, organizational conditions and strategic intents are linked together with the key business processes (e.g., sales processes, customer services process and direct marketing

process). This makes the management of CRM implementation projects a challenging task for the concerned stakeholders. As Bygstad (2003), Payne and Frow (2005) and Mendoza et al. (2007) stated, “Successful CRM implementation projects depend on the efficiency of the change management and the project management”.

HF5 Not Clear Objectives: Before starting a project, companies should be clear about the necessity of the project. CRM is a very popular IT system that nearly all companies regard CRM system as an essentiality but generally companies start the CRM implementation project without clear objectives and readiness. Without clear objectives, it is also impossible to create readiness for the changes of this new system in the company. Clear objectives and readiness are general necessities of all projects but for CRM system it is very important because CRM implementation is a strategic decision that should be clearly defined and also it is respectively a new concept for companies which differ from other IT systems. Because of these reasons it is necessary to take a consultancy about CRM concept to create readiness and then start the project (**HF5-A1**). CRM systems require organizational changes and employee support which brings a necessity of readiness of all departments. Without awareness of CRM concept, it is very difficult to obtain objectives so companies should create awareness of CRM concept by the help of consultancy (**HF5-A3**). Payne and Frow (2005) argue that successful implementation of a CRM program depends on four critical factors:

- CRM readiness assessment
- CRM change management
- CRM project management
- Employee engagement

Foss and Stone (2001) also remarks that poor planning, lack of clear objectives and failure to recognize the needs of business change are the key reasons for CRM failures.

As Hagemeyer and Nelson (2003) stated, “The failure of CRM project is caused by under estimation of complexity and the consequent changes by the companies”. As a result, it is necessary to take help form a consultancy company about creating reasonable and clear requirements for CRM implementation project (**HF5-A2**).

All departments of the company should share the same objectives and also coordination between departments according to general objectives should be provided by project

management team. Also as Kim and Kim (2009) stated, “A definite CRM goal has a positive impact on CRM success because it is likely to define a detailed set of CRM activities”. As a result, companies should create the objectives and requirements of the project in detail with a coordinated manner (**HF5-A7**). Some objectives of CRM projects are very important for project success especially for Telecommunication sector companies. They can affect the whole project and should be decided as soon as possible. These objectives that should be created and included in detail at objectives are as follows:

- CRM modules that that the company needs to implement (**HF5-A4**)
- Communication channels that CRM system should support (**HF5-A5**)
- Campaign management requirements (**HF5-A6**)

Table 3: Preventive Actions for Human Failures

Failure Reasons	**Specific Actions**
HF1→Organizational and cultural change difficulties	**HF1-A1**→Raising awareness throughout the whole company **HF1-A2**→Stating project sponsors **HF1-A3**→Creating project team as soon as possible **HF1-A4**→Creating a competent IT team that is being planned to be responsible of CRM system as soon as possible **HF1-A5**→Informing relevant parties about progress of the project as much as possible **HF1-A6**→Managing cultural change of company
HF2→Lack of support from relevant departments	**HF2-A1**→Deciding on the authorities of the project **HF2-A2**→Scope approval by all authorities of the project **HF2-A3**→Creating communication plans with all relevant departments **HF2-A4**→Informing relevant top management and taking their approvals about the progress of the project as much as possible
HF3→Consultancy selection mistakes	**HF3-A1**→Selecting an appropriate vendor **HF3-A2**→Work with a consultancy company
HF4→Project management difficulties.	**HF4-A1**→Selecting an appropriate project manager and give necessary authorization **HF4-A2**→Selecting an appropriate project manager or a management team
HF5→Not clear objectives	**HF5-A1**→Taking consultancy about CRM concept **HF5-A2**→Taking help from a consultancy company to create reasonable and clear requirements **HF5-A3**→Being aware about CRM concept **HF5-A4**→Deciding on CRM modules that is being planned to be implemented **HF5-A5**→Deciding communication channels with customers **HF5-A6**→Deciding on campaign management necessities **HF5-A7**→Creating all details of requirements

All actions that are stated in this part in parenthesis are stated at Table 3 together.

4.1.2. Technology

CRM should be supported by technological systems, without this support only human factor cannot create a successful CRM. As a result, technological systems should be regarded as a key component of CRM implementation projects. One of the main goals of CRM is to create a single and reachable customer data repository which is not possible without technology.

There are various technological solutions for CRM, software packages and databases that can be chosen as technological part of CRM. Technological solution selection is important because contents of available solutions can be different. Companies should plan the CRM project and select the technological solution according to this plan. Some modules can be redundant for the plan of the company and some can be very important. By its nature, CRM should integrate with legacy systems of the company. Integration is a technological concept and should be focused while making the selection about the software technology. For telecommunication sector, because of legacy system variety, integration is more important. Selected technology should be appropriate for integration with legacy systems of the company. Otherwise the company can experience integration difficulties and problems that are very difficult to solve.

As Sin, Tse and Yim (2005) noted, “CRM software systems enable companies to offer a customized service with higher quality but at lower cost, so many customer-centric activities would be impossible without right technology”. As a result, as Chalmeta (2006) noted, “To implement CRM successfully, the company must have the right technology with which to optimize the business processes involved in customer relationships”. Technology is an important factor of CRM implementation projects but do not mean any think without other factors, so technology can be regard as the enabling factor of CRM.

4.1.2.1. Technology Failures (TF)

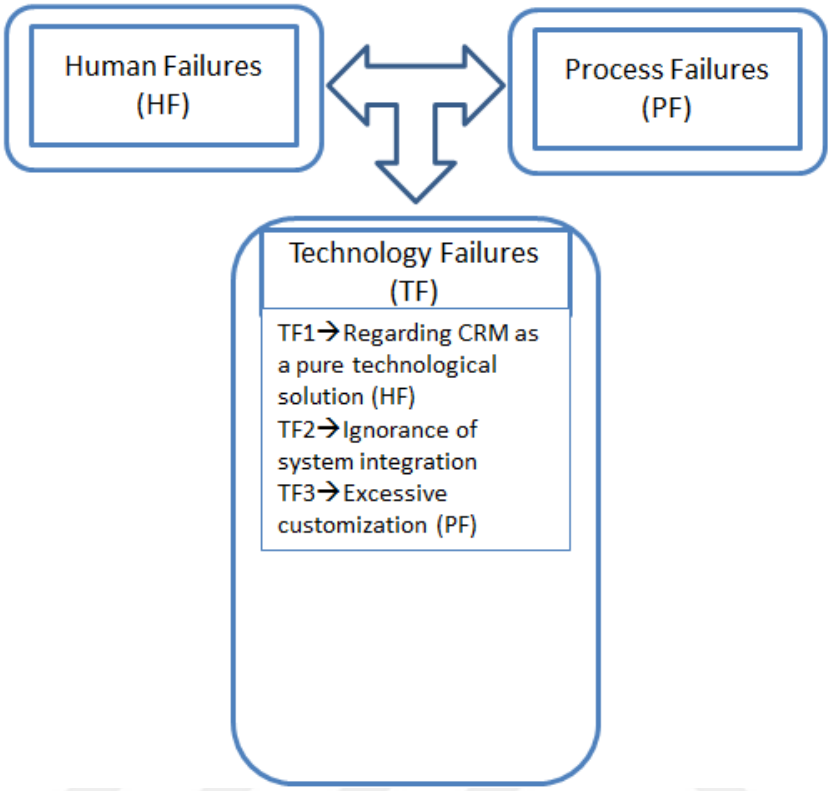


Figure 10: Technology Failures

Main situation about Technology factor is stated above; now specific failure reasons under technology aspect stated at Figure 10 are analyzed. In the following sub sections, details of these failure reasons and also actions that can be taken to prevent these failures are stated. Action codes are stated in brackets at the related parts.

TF1 Regarding CRM as a Pure Technological Solution: The most important reason of CRM failure is regarding CRM as a pure technological solution and not focusing on human and processes aspects. As Mendoza et al. (2007) stated, "Most organizations perceived customer relationship management (CRM) concept as a technological solution for problems in individual areas are accompanied by a great deal of uncoordinated initiatives". Also Moreno and Melendez (2011) stated that, "One of the main causes of failure is not integrating CRM into the company' s overall strategy, in other words, considering CRM as an exclusively technological tool and not assuming the various organizational and cultural

changes it entails. Companies should have a customer centric strategy and this strategy should trigger the necessity of CRM concept. As a result, companies first of all should create a customer centric strategy and define the objectives of CRM project parallel to this strategy (**TF1-A1**). As Lynch (2009) stated, "Strategy is a road-map or a plan which combines organization's major goals and action sequences into cohesive whole management Strategy usually deals with achieving organizational objectives which are formed by organizational missions and visions so without a business strategy it is also difficult to create a healthy customer strategy". Strategic changes mean some radical changes that require creating new processes and new teams or changing some existing processes and teams (**TF1-A8 and TF1-A9**). Also companies should add these necessities in the project plan to manage them successfully (**TF1-A2**).

As Hagemeyer and Nelson (2003) stated, "Organizations have a tendency to concentrate on the technological aspects and to see CRM systems mainly as computing projects when implementing them". According to Bose (2002), a critical component in the implementation phase is training that indicates the importance of human factor. All employees should be trained about CRM concept (**TF1-A4**). A CRM implementation may involve major IT and business process changes that all users must fully understand. Carlsson and Walden (2000) indicated that, "Often, intelligent IT projects are doomed because of people problems such as:

- People have cognitive constraints in adopting intelligent systems
- People do not really understand the support they get and disregard it in favor of past experience and visions
- People cannot really handle large amounts of information and knowledge
- People are frustrated by theories they do not really understand
- People believe they get more support by talking to other people (even if their knowledge is limited)"

Employees are generally preconceived about changes on their work routines and projects that bring these changes. Because of this reason, employees should be informed about the project and the changes that are planned because of project. This case is very important for CRM projects because they require employee support and reliance, especially for telecommunication sector companies that have variety of processes and contact points. As

a result, for CRM projects, employee adoption is very important. To increase the adoption of employees, companies should collect expectations of end users and take necessary actions about these expectations and also should create functional and simple interfaces that end users can easily use (**TF1-A6 and TF1-A7**).

Involving as many potential system users as possible is vital for the adoption of CRM within the organization. Making employees familiar with CRM concept is very important and it can be very helpful to create a web site that gives information about CRM concept and aims of company with the CRM project (**TF1-A5**). As Alt and Puschman (2004) stated, "This not only refers to establish necessary skills for operating the system but also to convince staff that the system will be beneficial". Informing employees about projects and responsibilities of them are important factors for CRM projects success. However, informing is not the only action that can be taken by the companies. Reward systems and motivation processes are important for strategic decisions such as CRM projects (**TF1-A3**). As Moreno and Melendez (2011) stated, "Factors such as employee training, motivation and establishment of appropriate reward systems will be determinant in employees' involvement in implementing this type of strategy". Also evaluating the training of end users is an important factor because without evaluation it is not possible to take necessary actions about training when necessary (**TF1-A10**).

TF2 Ignorance of System Integration: CRM systems aim to create a single view of customers for all necessary contact points and for all customer related data. Because of this reason, there should be a strong integration structure to take necessary data from all relevant operation systems, to send necessary data about customers to relevant operation systems or contact points. For CRM success, it is important for companies to identify how, where and which interactions can occur with customers. Also which data can be gathered from these interactions for CRM system and how can these data be transferred to CRM databases. Necessary processes should be created for data gathering and transferring.

Without successful integration between systems, some processes can turn out to a burden for employees at the contact points or at the back office side. Without a successful integration structure, data transferring or data integrity become a time consuming and a difficult process. For example, a customer comes to a customer contact point and wants to take information about unpaid bills, if there is a problem between CRM system and

collection system, agents cannot give this information. Also if the customer wants to complaint about a service but if there is an integration problem between field management systems and CRM systems, agents also cannot create a complaint ticket to field management system and cannot record the contact of the customer. Sometimes, these types of integrations can be time consuming and it can take long time and this causes customer un-satisfaction. Integration difficulty level is directly affected by organization's size. Chen and Popovich (2003) reported that, "Organizations' size is an important factor for the adoption of technological, administrative innovations and web services in organizations."

Because of these type problems, agents can create some short cut solutions such as not recording some necessary data about customer interactions which causes in the long run unsuccessful CRM systems and dissatisfied customers. The complaint of a change manager about CRM system according to an interview made with him is as follows (as cited in Beldi et al. 2009), "The tool was hardly ergonomic in the beginning; the response time was too long as tested by sales representatives and users criticized the slowness of the connection to CRM functionalities and the multiplicity of screen phases". As can be seen from this complaint, multiple screens and long response times can be catastrophic for companies. As Bose (2002) stated, "Integration with legacy systems is always a tricky matter as data is often structured around departments, functional areas, or some outdated method that is no longer used within the company".

Generally, companies do not focus on integration and integration tests. Units focus on their own parts and integration points cannot be tested sufficiently. Companies should devote enough time for integration tests (**TF2-A3**). Also, integration tests are not completed before the end of the implementation when it is very difficult to change or correct something. Because of this reason, integration structure of systems should be focused on at the beginning of the implementation part and strong integration architecture should be created for a successful CRM system (**TF2-A4**). For creating a successful architecture, companies should employ an appropriate technical architect who will be responsible of technical structure of CRM system (**TF2-A1**). Also a department or a team should take the responsibility of integration test, otherwise teams generally focus on test of their own systems and integration problems can be ignored (**TF2-A6**).

Integration is especially more important for telecommunication sector companies because there are various systems that should be integrated with CRM system. There are some extra actions that companies should take to decrease the risk of integration problems. These actions are as follows:

- Creating a phased project plan as spiral process model to minimize the integration failures and to be able to test every phase in detail (**TF2-A2**)
- Using spiral process model and controlling every modules before starting the following cycle and also testing every integration point (**TF2-A5**)
- Piloting the system and controlling the integration points in detail (**TF2-A7**)

TF3 Excessive Customization: A general failure reason at the information system implementation projects is high customization rates. To adapt a standard product is always easier and more confident for companies and project teams. Big software companies such as SAP, IBM, and Oracle create their products according to best practices all over the world. Trying to change the software according to the companies' processes create a new solution that is different from best practices. More appropriate way is to select the product that is more suitable for the goals of the company and adapt the processes of the company to the processes that are offered by the product (**TF3-A2**).

Customization is generally inevitable for big products such as CRM or ERP but it is important to keep the customization level at minimum levels. Customization means more expense and more time consumption for the projects. Also, customization decreases the control over the product because customization makes the upgrades more difficult and decreases the support from the product owner and consultant companies. As a result, high customization ratio not only risks the project success but also create a long term risk about product's up-to-datedness, so companies should decrease customization as much as possible (**TF3-A1**).

As the size of the product gets bigger, also customization problem also gets bigger so for projects as ERP and CRM, this problem is more important. As Zhedan et al. (2007) stated, "Minimizing customization is one of the success factors of CRM project and a CRM implementation should try to use standard products provided by ISV (Independent Software Vendors) and reduce works as much as possible for the customization". A careful

study of CRM product functionalities must be performed to make sure whether it can help to get the future process and achieve the project goals by adopting a CRM product. Normally, customization of the selected CRM product is the most costly and time consuming part of the projects. Therefore, in order to reduce time and efforts as well as risks, minimizing customization of CRM product, should be emphasized when CRM products are evaluated and selected.

Table 4: Preventive Actions for Technology Failures

Failure Reasons	Specific Actions
TF1→Regarding CRM as a pure technological solution	**TF1-A1**→Having a customer centric strategy **TF1-A2**→Including new processes and teams or changes about processes and teams at project plan **TF1-A3**→Including promotion processes **TF1-A4**→Including training of employees about CRM concept **TF1-A5**→Creating a web site to make employees familiar with CRM concept **TF1-A6**→Collecting end users' expectations and taking necessary actions according to them to increase users' convenience **TF1-A7**→Creating functional and simple interface design to increase the usability of the system **TF1-A8**→Performing and managing necessary process changes **TF1-A9**→Performing and managing necessary team creations **TF1-A10**→Caring about end users' training and evaluating training processes
TF2→Ignorance System integration	**TF2-A1**→Selecting appropriate technical architect **TF2-A2**→Creating a phased project plan as spiral process model **TF2-A3**→Devoting enough time for integration tests and stressing the importance of these tests **TF2-A4**→Caring about integration structure, technical details and data consistency **TF2-A5**→Using spiral process model and controlling every modules before start the following cycle **TF2-A6**→Caring not only unit tests but also integration tests and also delegating integration tests' responsibility to a party **TF2-A7**→Piloting the system and controlling the integration points in detail
TF3→Excessive Customization	**TF3-A1**→Decreasing customization as much as possible **TF3-A2**→Changing legacy processes according to the purchased solution

All actions that are stated in this part in parenthesis are stated at Table 4 together.

4.1.3. Process

For telecommunication companies, there are various processes that directly or indirectly have interaction with customers. As attitudes of employees that directly or indirectly interact with customers, processes are also very important for customer satisfaction. By the help of processes, companies meet the requirements and needs of customers and also remove the cause of their complaints. Processes also provide harmony in the company. Because of these reasons, processes are also important and should be focused on for successful CRM implementation. Processes that interact with customers should be analyzed and should be improved and automated as much as possible to increase the customer satisfaction ratio. Processes that interact with customers differentiate according to the sector of the company. Number of these processes also changes according to the sector.

According to Mendoza et al. (2007), processes that interact with customers can be grouped as follows:

- Marketing processes: According to Berkowitz, marketing is managing the relationship with the client, understanding the client's needs, knowing the client' s buying habits and all activities within the marketing processes.
- Sales processes: Sales employees and customers generally interact directly and sales processes directly affect customers.
- Service processes: Services are very critical for CRM concept. For customers it is very important how they are treated or how their problems are solved.

All necessary processes should be analyzed and missing ones should be implemented at CRM projects. Also some processes should be changed according to CRM strategy to increase the customer satisfaction. For example, decreasing the service intervals by the help of optimized processes can increase the customers' satisfaction levels. Telecommunication companies now can fix an appointment for fixed line set up and can send modems for the internet connection with cargo or with service personnel who go to location of customers. These are all examples of processes that can increase customer satisfaction level.

4.1.3.1. Process Failures (PF)

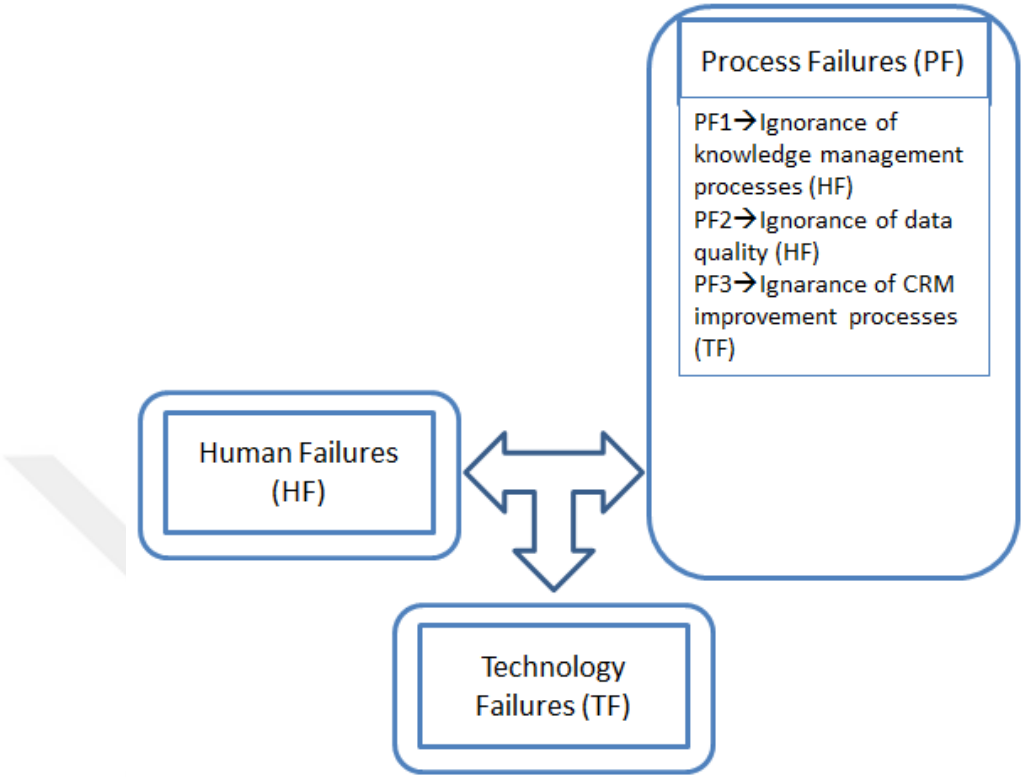


Figure 11: Process Failures

Main situation about Technology factor is stated above; now specific failure reasons under technology aspect stated at Figure 11 are analyzed. In the following sub sections, details of these failure reasons and also actions that can be taken to prevent these failures are stated. Action codes are stated in brackets at the related parts.

PF1 Ignorance of Knowledge Management Processes: Knowledge plays an important role for CRM success because to create appropriate processes for customers and manage marketing activities correctly, knowledge about customers is very important. Especially analytical CRM aims to create knowledge about customers by the help of analyses and statistical methods on the data of customers that collected by the help of operational CRM. As Dous, Kolbe, Salomann and Berener (2005) stated, "In recent years, companies have integrated their CRM and KM (Knowledge Management) efforts because they realize that KM plays a key role in CRM success". Beijerse (1999) stated that "CRM is about managing

customer knowledge better to understand and serve them". As Stefonuo, Sarmaniotis and Stafyla (2003) stated that "CRM is definitely related to the discipline of KM, thus, the existence of sufficient and continually updated customer knowledge is critical for an effective CRM system". At telecommunication sector, knowing and perceiving customers' needs as soon as possible and taking necessary action according to these needs are very important to obtain competitive advantage. This is very important especially for surviving at the market because telecommunication sector is very dynamic and competitive. Customer knowledge management aims to capture customer information, build customer relationships and improve customer related work practices and processes. As Chang et al. (2005) stated, "Customer knowledge management can be described as the mechanism to capture, store, and share customer perspective knowledge to add organization values". Zablah, Bellenger and Johnson (2004) stated that, "We see KM as the main sub process of CRM because to manage CRM effectively, companies must develop capabilities related to customer KM processes". As Shi and Yip (2007) stated, "Since knowledge management capabilities are difficult to imitate, they can become a source of competitive advantage". Knowing about the customers gives the ability to companies for creating valuable opportunities and offers for customers that bring them competitive advantage which is difficult to be imitated.

The problem about this concept is not paying attention to knowledge management or analytical CRM which is one of the main components of CRM (the other one is operational CRM). Analytical CRM aims to create meaningful knowledge about customers to help company about creating strategic long term decisions. Companies generally focus on operational CRM concepts and ignore analytical CRM applications and processes which create very important value and competitive advantage in the long run. As Alt and Puschman (2004) stated, "Filling the database with meaningful information and achieving adoption in the areas of marketing, sales and service was considered to take minimum of 2 years". Operational CRM effects can be observed in a shorter time than analytical CRM effects, this is the main reason for this ignorance but a very costly ignorance for CRM success. As a result, companies should plan the analytical CRM necessities and processes at CRM projects (**PF1-A1**).

Analytical CRM is very important for telecommunication companies because they generally has a huge number of customers that should be managed by the CRM system, and also successful segmentation is possible only with successfully implemented knowledge management and analytical CRM.

PF2 Ignorance of Data Quality: As mentioned at previous part, knowledge is an important factor for CRM projects. Data is the main building stone of knowledge. To create correct and helpful knowledge, data gathering and correctness and integrity of these data become very important. Friedman (2009) stated that "Clearly, the challenge of managing the complex data quality issues involved has been raised as a potentially important factor affecting the successful outcome of CRM effort". Also according to Kaila and Goldman (2006), more than half of CRM projects are failing because of complex data quality issues involved. CRM projects are generally implemented on companies that have still legacy systems and data repositories. Because of this reason, companies should use current data at their CRM systems, analytical CRM processes and knowledge management processes.

Available data should be migrated to CRM system after completion of CRM implementation. However, migration of these data without preparation can cause harmful effects on the success of CRM project. Starting with clean data is important for CRM success because analytical CRM is using these data. Also with dirty data, it is not possible to create processes that are based on these data because companies cannot trust on them. As a result, companies should include data cleansing process at the project plan (**PF2-A4**).

CRM systems aim to create a single view for every customer and to present all services that belong to the same customer. However for this aim, companies should be able to understand the owner of the services accurately. This is possible with a unique identifier such as TIN (Turkish Identity Number), but generally customers are created without TIN, so before starting CRM project or as a parallel process, data cleansing should be operated. As Bose (2002) stated, "Great care should be taken to ensure the data is clean, and that appropriate procedures are implemented to ensure data integrity within the system. We also want to use the information to make more enduring management decisions – decisions that will ultimately lead to even higher customer satisfaction. These types of decisions may include information about new product development, product changes, marketing mix factors, budgeting, scheduling and financial planning. Such information will

not be available without clean, organized and accurate data." There should be also a common language in the company for data to create the data integrity between systems. However, as Hagemeyer and Nelson (2003) stated, "There is evidence that this common language of logically compatible data does not exist in a great many organizations that have implemented business intelligent applications in general and CRM in particular".

As the data volume increases also data cleansing process gets difficult and time consuming. Especially for telecommunication sector that have huge volume of customer data, data cleansing is a more difficult and challenging process.

Generally companies do not place enough emphasis on data cleansing processes because they generally focus on operational activities and they think that cleansing can be operated after implementation of CRM. However, this is a big mistake because after implementation, it is very difficult to clean the data on the running system. Eckerson (2002) stated that "In spite of the conceptual appeal of methods and programs for achieving data quality, many organizations undertaking a CRM strategy are unaware of customer's data quality problems". Also as Hagemeyer and Nelson (2003) stated, "Many organizations undertaking a CRM strategy are not investing enough efforts in improving data quality processes to support their CRM applications". According to a study published by Hagemeyer and Nelson (2003), almost 70% of CRM failures were attributed to issues with data reliability. Also the TDWI (Data Warehousing Institute) (as cited in Eckerson 2002) reports that "Poor data quality is costing companies more than €400 billion a year". In the long run, marketing or customer care departments cannot create processes that aim to increase the customer satisfaction level. Also analytical CRM cannot create meaningful knowledge about customers. As a result data cleansing failure or ignorance causes CRM failure.

Companies generally do not create a data scope and data management rules. As Alshawi et al. (2010) stated," Since data are foundation of every CRM initiative, it is imperative to put in place a data strategy before CRM project begins". As a result, companies should decide about data scope and management rules of these data (**PF2-A1**). Also companies should create processes to conserve the data integrity and cleanliness of the existing data, for example creating new customer process can be blocked without a valid TIN number.

As can be seen, data and data management is very important for CRM success, because of this reason companies should assign appropriate staffs that will be responsible for data management and data mining processes (**PF2-A2 and PF2-A3**). These staffs should manage the end to end data gathering, data management, data mining and data using processes.

PF3 Ignorance of CRM Improvement Processes: As technology develops and changes, expectations of customers also changes. For example about few years ago, there were not mobile phone applications but nowadays nearly every bank and GSM companies have mobile phone applications. So there is a new contact point or channel with customers. About ten years ago, cargo companies were not so actively used at campaign processes of telecommunication companies but nowadays most of the companies send products to the address of customers by the help of cargo companies so customers do not need to visit the offices for taking the products. These new processes are all results of customer needs that should be observed by the companies continuously. As a result, CRM processes that affect the customer satisfaction ratio should be observed by the help of marketing analyses that can be supported by analytical CRM processes. CRM system improvement is an endless and continuous process and to obtain an up to date CRM system, improvement processes should be created. It is important to have a generic and modifiable CRM system to be able to create new processes and support new channels (**PF3-A1**). Generally companies do not focus on this criterion and do not create improvement processes so after a while of successful implementation; CRM system can be out of date and not responding to the needs of the customers and companies. Because of these reasons, companies should observe the system usage and take the necessary actions when necessary (**PF3-A2**).

Table 5: Preventive Actions for Process Failures

Failure Reasons	Specific Actions
PF1→Ignorance of knowledge management processes	**PF1-A1**→Planning analytical CRM necessities and processes
PF2→ıgnorance of data quality processes	**PF2-A1**→Deciding data scope and management rules of these data **PF2-A2**→Assigning an appropriate staff for data management responsibility **PF2-A3**→Assigning an appropriate staff responsible for data mining responsibilities **PF2-A4**→Including data cleansing process at the project plan
PF3→Ignorance of CRM Improvement processes	**PF3-A1**→Selecting a configurable solution package **PF3-A2**→Observing system usage and taking necessary actions if necessary

All actions that are stated in this part in parenthesis are stated at Table 5 together.

4.1.4. Failure Reasons Statistics on Literature Reviews

Table 6: Reference Coverage Statistics

Failure Reason	Score	Ratio (%)
TF1→Regarding CRM as a pure technological solution	18	37,5
HF1→Organizational and cultural change difficulties	9	18,8
PF2→Ignorance of data quality	8	16,7
HF4→Project management difficulties	8	16,7
PF1→Ignorance of knowledge management processes	7	14,6
HF2→Lack of support from relevant departments	6	12,5
TF2→Ignorance of system integration	5	10,4
PF3→Ignorance of CRM improvement processes	4	8,3
HF5→Not clear objectives	2	4,2
HF3→Consultancy selection mistakes	2	4,2
TF3→Excessive customization	1	2,1

Failure reasons are stated according to literature reviews. To make a comment about relative importance of these failure reasons, references coverage statistics of these failure reasons are stated. The result of this work is stated at Table 6. There are total 48 articles so score can be maximum 48. At ratio column, ratio between full score and score also stated to use at comparisons. Details of this table can be seen in Appendix C. As can be seen from

the literature coverage statistics, the most stated failure reason by literature is regarding CRM as a pure technological solution and ignoring human and process factors. Generally, soft system related reasons are the most stated failure reasons by literature works. The main reason of this situation is not regarding the CRM projects as a cultural change project and only focusing on the hard system related topics or technological factors and ignoring soft system related topics.

4.2. Expert Opinions about Failures

For clarifying and validating the failure reasons that determined by the help of literature reviews, opinions of five experts from telecommunication sector of Turkey are taken by the help of interviews made with them about failure reasons of CRM projects. Also their opinions about solutions for these failure reasons are taken. Experts that chosen for these purpose are very experienced about telecommunication sector and CRM projects. Profiles of experts that interviews made with are as follows. Also abbreviations of these profiles are stated in parenthesis to use in the following section.

1. A telecommunication expert that took role at CRM projects' IT teams at different companies (**CRM-Expert**)
2. A technical manager at a Software Company that creates CRM solutions for telecommunication companies in Turkey market (**Technical-Manager**)
3. A Telecommunication sector professional who is a manager of CRM team of a Telecommunication company (**Telco-Manager**)
4. A marketing director of a Software company that creates CRM solutions for telecommunication companies in Turkey market (**Marketing-Director**)
5. A chief technology officer (CTO) of a telecommunication company (**Telco-CTO**)

Interviews were not made as question and answer type. The aim of this thesis is stated to them and they asked to state their opinions about this topic. Generally their ideas are parallel with literature work. Their mostly emphasized ideas are as follows:

CRM Expert

- CRM is an obligation anymore, especially for Telecommunication sector companies

- It is very important for companies to know about their customers as much as possible
- Success rate of CRM projects are low according to other IT based projects
- Business units are not experienced enough about CRM concept so they cannot create clear and reasonable objectives (**HF5**)
- Business units can plan some side visits or can take help from consultancy companies about CRM concept before creating objectives
- Analytical part of CRM is ignored by companies that create value in the long run. Companies generally focus only on Operational CRM. However, analytical CRM is the most important part of CRM system (**PF1**)
- Business units should work on analytical CRM reports and how to use these reports to create value for customers
- CRM is a strategic change and need some wide ranging changes about processes and organizational structures, so management support is very important to support these changes. Companies generally cannot ensure these changes because of management and all relevant departments support absence (**HF1 & HF2**)
- Use a phased implementation plan is important because CRM have various modules, it is very risky to implement all of them at a single phase (**TF2**)
- All employees and departments should embrace CRM strategy. Technical side of CRM system should be supported by human factor (**TF1**)
- A qualified IT team should be created as soon as possible, generally companies do not create a new team for CRM projects but current IT teams generally cannot support CRM systems effectively
- Because of the nature of CRM, integration is very important. CRM projects generally fail because of unsuccessful integration structures (**TF2**)

Technical manager

- Telecommunication companies are more powerful about service provider selection
- At Turkish Telecommunication market, competition is more powerful by the help of governmental obligations
- Because of strong competition, customers satisfaction and CRM system is more important for Telecommunication sector companies

- Most of the companies cannot obtain all advantages of CRM systems
- Companies generally migrate current data to CRM system without executing cleansing activities, because of these reason they cannot use analytical CRM effectively (**PF2**)
- Integration architecture of CRM system is very important, without successful integration architecture, it is difficult to use CRM system appropriately (**TF2**). For creating successful integration architecture, support from legacy systems is very important.
- Business units generally focus on technical side of CRM project and ignore structural, cultural and process changes necessities (**TF1**)
- Organizational and cultural change necessities generally ignored and not managed by project teams, nobody take action about these necessities because of authorization absence (**HF1**)
- Generally business units do not know CRM concept and because of this reason they cannot create effective objectives
- Taking consultancy about CRM concept is necessary because of lack of CRM concept knowledge (**HF5**)
- Companies generally do not take necessary permissions and support from relevant departments because of lack of an effective plan and clear objectives
- Companies generally ignore analytical CRM part which creates more beneficial result for companies in the long run. Also they do not create necessary processes for knowledge management (**PF1**)
- Promotion or other encouragement methods should be used to motivate end users to use the CRM system effectively and increase the data gathering
- Business units generally do not use reports that created by analytical CRM, necessary processes and reports should be worked by business units
- CRM is not a just hard system but also a soft system that requires organizational, structural and cultural changes because of this reason, project management for CRM projects is very important. Project managers of CRM projects generally cannot manage these comprehensive changes because of lack of experience (**HF4**). Also authorization level of project managers should be high enough to enable them take necessary actions

- Using a phased project plan is very important for CRM projects that has a wide sphere of influence

Telco Manager

- CRM concept is relatively new because of this reason, business units cannot create clear and realistic requirements for CRM project (**HF5**)
- It is necessary for CRM system to be integrated with other systems in the company such as ERP, billing and invoicing system and collection system. As a result all departments that are responsible for these systems should support CRM project and also should take role at the project team (**HF2**). Generally CRM projects are regarded a just IT department project.
- Technological part of CRM cannot create value for the company on its own; it should be supported by necessary processes and human resources (**TF1**)
- CRM projects are not only IT department projects; all business units should take part at CRM projects and should support creating new processes
- Because of CRM concept, some new processes should be created or some existing processes should be updated. Data gathering is the most important process for CRM system. Business units should focus on these necessities.
- Senior management generally does not give full weight to CRM system management difficulty and does not support creating a sufficient IT team for CRM responsibilities.
- Not only relevant departments but also senior management should be familiar with CRM concept. CRM generally regarded as an IT system that only record customer data. It can be helpful to take consultancy from a consultant company about CRM concept and CRM strategy.
- Analytical CRM is generally ignored by business units. However, analytical CRM is more important than operational CRM because companies can create strategic decisions by the help of analyses of analytical CRM. Gaining competitive advantage is only possible with analytical CRM that help about long term strategic decisions

Marketing Director

- Because of integration architecture defects, CRM systems are generally very slow and because of this reason, end users cannot use the system effectively (**TF2**)
- Generally, not all requirements supported by the purchased CRM packages so business units cannot create all necessary processes by the help of CRM system. Companies should select the most appropriate solution package according to requirements and should select the most configurable solution package (**PF3**)
- Generally not all departments support the necessities of CRM system. Because of CRM concept, some new processes should be created but because lack of support from all relevant departments, most of them cannot be created (**HF1**)
- Data gathering is very important for CRM concept. Without data, companies cannot create value by the help of CRM system. For data gathering, human factor is very important. End users should be promoted to use the CRM system effectively and enter the all necessary data to the system. As a result, promotion process should be created (**TF1**)
- For creating effective campaigns and packages, customer usage trend reports are very important. These reports can be created by the help of analytical CRM. However companies generally focus only on operational CRM and ignore analytical CRM (**PF1**)
- After implementation, CRM system generally becomes out of date and do not respond to all requirements. Because of these reason, change requirements and support of IT department for these change requirements are very important. For updating or making necessary configuration changes, a sufficient IT team is very important (**HF1**).
- CRM concept is generally not known by companies because this concept is relatively new for companies. Companies generally start CRM projects without knowing the concept that result a failed project. It is important to take a consultancy service from a consultant company about CRM concept and necessities of CRM (**HF5**)

Telco CTO

- CRM is very important for Telecommunication sector companies. Without CRM it is very difficult to manage customers and customer requirements
- CRM is a strategic decision and should be supported by senior management of company not only technology department. Technology department can lead CRM projects but other departments also should be involved in the projects and also they should support the necessary actions (**HF2**)
- Business units generally are not experienced about CRM concept and their requirements about CRM system are not sufficient and appropriate for CRM concept. For companies it is important to take help from a consultancy company about CRM concept (**HF5**)
- For a successful CRM system, structure and culture of the company should be changed radically. Without necessary cultural and structural changes, CRM cannot create value for companies and customers (**HF1**)
- Project manager selection is very important for CRM projects because scope of CRM projects are very wide and include comprehensive changes so project manager should be experienced enough about CRM concept (**HF4**)
- Vendor selection is very important because wrong vendor selections can create a problematic situation for CRM projects. Also agreement rules with vendor should be worked on extensively (**HF3**)
- Companies generally regard CRM as a pure technological solution and ignore creating new teams and processes. However, without necessary new teams or processes, it is not possible to create value for customers (**TF1**)

4.2.1. Failure Reasons Statistics on Expert Opinions

Table 7: Expert Opinions about Failure Reasons

Failure Reason	Score	Ratio (%)
HF5→Not clear objectives	5	100
TF1→Regarding CRM as a pure technological solution	5	100
HF1-->Organizational and cultural change difficulties	4	80
TF2→Ignorance of system integration	3	60
HF2→Lack of support from relevant departments	3	60
PF1→Ignorance of knowledge management processes	3	60
HF4→Project management difficulties	2	40
PF2→Ignorance of data quality	1	20
PF3→Ignorance of CRM Improvement processes	1	20
HF3→Consultancy selection mistakes	1	20
TF3→Excessive customization	0	0

Summary of expert opinions is stated at Table 7. Interviews are made with 5 experts, ratio of total interviews and score of failure reasons are also stated at the table. As can be seen, failure reasons that stated by literature and experts are parallel and except TF3, all of them also stated by CRM experts. TF1 and HF1 which were mostly stated by literature were also stated by most of the experts. According to this analysis, it can be interpreted that, Turkish Telecommunication companies face with same failure reasons that stated by literature work.

4.3. Survey with CRM Experts of Telecommunication Sector

At previous sections, failure reasons of CRM projects are stated according to literature reviews and expert opinions. By the help of the result of previous sections, a survey is created and shared with 45 CRM experts from telecommunication sector to check the validity of these failure reasons for Turkish telecommunication sector. Also, experts are asked to state other failure reasons according to them that are not stated by literature works.

Table 8: Survey Result on Failure Reasons

Failure Reasons	Score	Ratio (%)
TF1→Regarding CRM as a pure technological solution	164	72,9
HF1→Organizational and cultural change difficulties	128	56,9
HF5→Not clear objectives	112	49,8
HF4→Project management difficulties	88	39,1
TF2→Ignorance of system integration	55	24,4
HF2→Lack of support from relevant departments	38	16,9
TF3→Excessive customization	33	14,7
PF2→Ignorance of data quality	27	12
PF1→Ignorance of knowledge management processes	11	4,9
PF3→Ignorance of CRM improvement processes	10	4,4
HF3→Consultancy selection mistakes	9	4

Survey that is made with CRM experts is given in Appendix 1. Total score that can be taken at this analysis is 225 (45*5). Scores of failure reasons and ratio between scores and full score are calculated as shown at Table 8. Scores are calculated as the total points of failure reasons that experts gave to them. As can be seen from the result, TF1 and HF1 which were mostly stated by literature were also regarded by experts as the most important failure reasons.

Additional factors that are stated by experts at the survey are as follows, but they are generally not failure reasons. They are preventive actions for problematic situations.

- "A phased project plan is important for CRM projects. Proceeding step by step is important to increase the observation ability and success ratio of the project." (stated by 14 people)
- "New teams should be created as soon as possible to manage CRM modules and also to take the responsibility of CRM configuration processes." (stated by 9 people)
- "Defining the most important modules according to requirements and implementing the most important modules firstly to increase the system usage ratio and increase the feed backs." (stated by 7 people)
- "Create promotion process to increase the system usage and make the users to use the system appropriately and correctly." (stated by 6 people)

- “End users’ expectations are important for CRM projects, expectations and feed backs should be collected and necessary actions should be taken as much as possible according to them.” (Stated by 4 people)
- “Piloting is important for projects like CRM that affect many processes of the company that directly touch to customers. By the help of piloting it is possible to observe the system at a small perspective of the whole company.” (stated by 2 people)

Table 9: Comparison of Reference and Survey Results

Failure Reasons	Ratio of References (%)	Ratio of Survey Result (%)
TF1→Regarding CRM as a pure technological solution	37,5	72,9
HF1→Organizational and cultural change difficulties	18,8	56,9
HF5→Not clear objectives	4,2	49,8
HF4→Project management difficulties	16,7	39,1
TF2→Ignorance of system integration	10,4	24,4
HF2→Lack of support from relevant departments	12,5	16,9
TF3→Excessive customization	2,1	14,7
PF2→Ignorance of data quality	16,7	12
PF1→Ignorance of knowledge management processes	14,6	4,9
PF3→Ignorance of CRM improvement processes	8,3	4,4
HF3→Consultancy selection mistakes	4,2	4

As stated above, references from literature work and expert opinions are parallel, TF1 and HF1 are the reasons that have the higher ratios at literature works and experts opinions. Also all of the failure reasons that are stated by literature works are also stated by experts. Comparison of literature references and survey results are shown at Table 9.

5. THE ROAD MAP ELABORATION PROPOSAL

Up to this chapter, by the help of literature reviews, expert opinions and survey, failure reasons of CRM projects at telecommunication sector are stated. The aim of this chapter is to map the preventive actions of these failures on a new system implementation road map and create a road map elaboration. By the help of this road map elaboration, companies can see the probable failures and critical points at the specific steps of CRM project. Also preventive actions are stated at these steps to help companies about taking preventive actions.

5.1. New System Implementation Road Map

The aim of this section is to state the preventive actions of failures on a new system implementation road map so a standard implementation road map is necessary to be extended by preventive actions and critical points.

According to Turner (2008), standard project implementation road map steps are as shown at Table 10. According to Turner, a new system implementation road map is composed by four main steps. These are vendor selection, planning, design and rolling out steps. In the following section this road map is used to be extended.

Table 10: Standard Project Implementation Road Map

Step 1	Vendor selection
Step 1.1	Choice of vendor
Step 2	Planning part
Step 2.1	Define objectives
Step 2.2	Define CRM project scope
Step 2.3	Elaborate communication plans
Step 2.4	Define the appropriate project organization (membership, roles and tasks)
Step 2.5	Collecting end users' expectations
Step 2.6	Define detailed objectives
Step 2.7	Planning project
Step 2.8	Ensure appropriate resources
Step 2.9	Launching CRM project web site on the company intranet
Step 3	Design part
Step 3.1	Technical design
Step 3.2	Interface design
Step 3.3	Customization and upgrading of CRM software
Step 3.4	Controlling the results of work packages (give the order to go or not go in terms of technical aspects) and ensuring the quality
Step 3.5	Setting of the software package
Step 3.6	Integration tests
Step 3.7	Project piloting and controlling
Step 3.8	Training of volunteering relay
Step 3.9	Communication with top management and local managers
Step 3.10	Communication within agencies by the help of regular meetings, hotline, flashes and newsletters
Step 3.11	BPR (Business Process Reengineering) deployment
Step 4	Rolling out phase
Step 4.1	Usage evaluation
Step 4.2	Evaluation of end users training
Step 4.3	Institutional communication of success through Intranet and newsletter

5.2. CRM Specific Actions on Road Map

To prevent failures, there are some actions that can be taken as stated at section 4.1. Some of these actions that should be included in the road map are specific for CRM implementation projects and some of them are common with other projects.

Table 11: CRM Specific Risky Steps with Necessary Actions

Road Map Step	Critical activities specific for CRM projects to be added to the roadmap
1. Vendor Selection	
1.1. Choice of vendor	**PF3-A1**→Selecting a configurable solution package (section 4.1.3)
2. Planning Part	
2.1. Define objectives	**TF1-A1**→Having a customer centric strategy (section 4.1.2) **HF5-A3**→Being aware about CRM concept (section 4.1.1) **HF5-A4**→Deciding on CRM modules that is being planned to be implemented (section 4.1.1)
2.2. Define CRM project scope	**HF5-A5**→Deciding communication channels with customers (section 4.1.1) **PF2-A1**→Deciding data scope and management rules of these data (section 4.1.3) **PF1-A1**→Planning analytical CRM necessities and processes (section 4.1.3) **HF5-A6**→Deciding on campaign management necessities (section 4.1.1)
2.3. Elaborate communication plans	**HF1-A1**→Raising awareness throughout the whole company (section 4.1.1)
2.4. Define the appropriate project organization (membership, roles and tasks)	**PF2-A2**→Assigning an appropriate staff for data management responsibility (section 4.1.3) **PF2-A3**→Assigning an appropriate staff responsible for data mining responsibilities (section 4.1.3)
2.7. Planning project	**PF2-A4**→Including data cleansing process at the project plan (section 4.1.3) **TF1-A3**→Including promotion processes (section 4.1.2) **TF1-A4**→Including training of employees about CRM concept (section 4.1.2)
2.9. Launching CRM project web site on the company intranet	**TF1-A5**→Creating a web site to make employees familiar with CRM concept (section 4.1.2)
3. Design Part	
3.11. Business Process Reengineering(BPR) deployment	**HF1-A6**→Managing cultural change of company (section 4.1.1)
4. Rolling Out Phase	

At Table 11, CRM specific risky steps and preventive actions are stated on the implementation road map so this table only shows the road map steps that include CRM

specific preventive actions. Road map steps that include common risks are stated in Appendix E.

As mentioned at part 2.2, CRM system has various modules. In the following sub sections, details of road map steps, special CRM modules related with the step and some technological tools that can be used at these steps are stated. Also, actions that should be taken by companies to prevent failure reasons are mentioned with some examples.

Vendor Selection

Choice of Vendor (Step 1.1): CRM Vendor selection part is important for CRM projects. It is necessary for companies to allocate enough time for vendor and solution package selection. Appropriate selection could minimize the customization necessities and extra capabilities that are not necessary for the company. As a result, appropriate selection minimizes the system expenditure.

Some vendors can be stronger for some CRM modules so while selecting the vendor, it can be helpful to focus on the modules that will be implemented separately.

Planning Part

Define objectives (Step 2.1): It is very important to be aware about CRM concept before defining the objectives of the CRM project. It can be convenient to take help from a consultancy company about CRM concept and CRM related requirements of the company.

CRM is a strategic decision and a clear customer strategy is necessary before starting and planning the CRM project. It is also important to have a business strategy to create a customer strategy.

At the planning part of the project, it is very important to decide about the modules of CRM system that the company needs to implement according to requirements and strategy of the company. According to this decision, number of spiral process cycles also can be specified. In this step, it is also important to decide the authorities of CRM concept in the company to give decision about objectives together with all authorities.

According to selected functionalities, all necessary actions such as changing some processes, creating new processes and creating new teams should be determined roughly

and necessary permissions from executive management should be taken for every module. In this step, high level objectives should be stated and for this step a context diagram can be used for documentation. Also for stating other relevant systems, a frame diagram can be helpful.

Define CRM project scope (Step 2.2): After stating the objectives of CRM project, an appropriate project manager should be selected and if possible project manager should be experienced about CRM concept and also should have managed a CRM project at a telecommunication company before. Project scope statement should be created by the project manager approved by project sponsors and CRM decision authorities for every module separately. Specifically for CRM projects, scope of the project should include some extra decisions about some topics as follows:

- Communication channels; communication channels can be various for telecommunication sector. They affect the project plan and technologies that should be used. Also there is a separate CRM module named "channel management module" which aims to manage communication channels, configuration of these channels, supported transactions from these channels and users relationships.
- Data that will be included in the CRM system; data that related with customers can be kept at various legacy systems. Which of them should be included by CRM system is an important decision and should be stated at the scope statement. This step directly affects the analytic CRM module because data that should be managed by analytics module of CRM. Managing rules of these data should be stated at the analytics module.
- Analytical CRM; this is the most important part of CRM system that creates value in the long run. Analytical CRM generally includes reports and usage processes of these reports. At the scope definition part, companies should state the analytical CRM necessities. These necessities also should be stated at the planning part of the analytics module.
- Campaign management; it should be included in the scope of CRM project. Campaign management module of CRM system should be as flexible as possible because competition is very strong at telecommunication sector and companies should offer various and flexible campaigns to their customers.

Elaborate communication plans (Step 2.3): After gave a decision about scope of the project, raising awareness throughout the company is the other important factor. CRM is a strategic decision which should be assimilated throughout the company and supported by all employees and departments especially by departments and employees that directly related with customers. Support and collaboration is very important for CRM projects that affect whole company directly or indirectly. This necessity is desired for all modules of CRM.

At the beginning of the project, modules that are planned to be implemented should be decided by all relevant parties of the company. According to these modules, relevant parties of the project should be stated and all these parties should take role at the project. Also all of these parties should be included at the communication plan and should be informed about all updates about the project.

For an efficient communication, it is important to create a project e-mail group and also it can be very helpful to create an intranet document sharing folder. For this purpose, Microsoft share point or some similar technologies can be used.

Define the appropriate project organization (Step 2.4): This step is a general step for all projects which generally include creating a RACI (Responsible, Accountable, Consulted, and Informed) matrix that states the roles and responsible project members. As all other projects, roles and responsible members are important but there are some important roles for CRM projects that should be focused on. These roles are as follows:

- Project sponsors; sponsors should support and follow the project effectively
- Technical architects; because of integrations with legacy systems, technical infrastructure is very important especially for Telecommunication sector and for all modules of CRM.
- Project manager; project manager should be competent enough about project management, CRM concept and Telecommunication sector. Also he or she should be competent enough about all modules of CRM that the company intended to implement.
- Data manager; CRM concept is founded on customer data, because of this reason data and person who is responsible to manage these data are very important. Generally, data managers are also responsible for analytics module of CRM.

- Data mining manager; Analytical CRM is very important for long term aims of CRM. Data mining and distributing the results of data mining process to relevant parties are the responsibilities of data mining manager.

To create a more visual project organization, an organizational chart can be used by the help of Microsoft Visio.

Planning project (Step 2.7): According to objected functionalities, a project plan should be created by the project manager. Time, cost and quality concepts should be focused in this step as all project plans.
Because of being a CRM project and telecommunication sector specialties, following steps should be focused and included at the project plan:

- According to decision about data that will be included by the CRM system, data cleansing process should be included in the project plan.
- CRM projects are generally comprehensive and include modules so it is important to crate phases. Companies should not try to implement full scope and solution package at a single phase. Spiral process model can be selected that aims to implement project step by step and with a phased method.
- Training of employees about CRM is very important for success of the project. Training should not only include training of system end users but also it should include training about CRM strategy and concept. Training about CRM concept is important regardless the module of the system.
- System integration tests are very important for CRM projects. Integration tests step should be detailed enough to include all necessary tests about integration points. Nearly all CRM modules need integration with legacy systems so integration tests are important for all of them.
- New processes and teams creation is very important for CRM projects. For telecommunication sector, it is more important because there are various processes that touch to customers which are necessary for CRM concept. New processes and new organizational units can change between companies and modules. Some companies can create a new team for campaign management but

some others do not need a new team but for all modules, companies should create necessary processes to affectively use the modules.

- Creating promotion process to stimulate end users is very important. For strong competition, telecommunication companies should know about their customers as much as possible. Also, successful campaigns, products and services are only possible with customers' data that mostly can be gathered by end users.

  CRM systems generally support promotion processes with a separate module. Trade promotion management module is used for this aim. As a result, to increase the usage ratio of the system, this module is very important especially for telecommunication companies.

At this part it is important to take assistance from a technological tool such as Microsoft Project that makes the project planning activity more manageable and understandable.

Launching CRM project web site on the company intranet (Step 2.9): CRM project is a strategic decision that all members of the company should know about. Because of this reason it is necessary to launch CRM project at an intranet portal or at a similar platform. Also, company should inform the employees about CRM culture and expectations of the company by this concept.

Design Part

Business Process Reengineering (BPR) deployment (Step 3.11): Some of the existing business processes should be changed and also some new business processes should be created to support CRM strategy and CRM system. Business process is one of the main items of CRM strategy as people and technology. Deficiencies or mistakes about business processes directly cause failure of CRM implementation projects.

Project team should determine and define process changes and new process necessities. By the help of concerned departments and managers, project team should manage business processes reengineering step. For every modules of CRM system, there can be new processes or process change necessities. Numbers and size of these processes can be different for different modules but for all of them BPR is very important because without processes, technology cannot create value.

6. EVALUATION OF ROADMAP ELABORATION

A roadmap elaboration is proposed in the previous chapter showing important and risky steps that should be focused to successfully implement CRM projects and obtain objectives. In this section, to validate this roadmap elaboration, two CRM projects from telecommunication sector are analyzed. These companies operate at Turkish telecommunication market. Because of privacy reasons, these companies are mentioned as Company X and Company Y. Company X is a fixed line telephone and infrastructure provider company and Company Y is an internet provider company. CRM projects of these companies are analyzed according to CRM specific and non CRM specific risky steps and preventive actions. At the end of these analyses, CRM specific and non CRM specific actions are separated.

Details of these companies are as follows:

Company X is one of the biggest organizations in Turkey. Company X which is providing PSTN (Public Switched Telephone Network) services has had an acting role in Turkish telecommunication market for long years. Company X, which is a private company, can also be regarded as one of the largest companies in Turkey with its employee and customer numbers. Company X has about 16 million customers. Even Company X has a profitable and strong situation in the market; there is couple of threats which needs to be taken into consideration. As mobility and GSM (Global System for Mobile Communications) sector growing fast, fixed-line operators like Company X are facing couple of challenges in customer acquisition and retention.

Especially after year 2000 there is a trend that people don't want to talk with fixed line telephones; they prefer talking while they are mobile. Technology enables people to communicate while they are not connected to a station with a wire. Also it is true that, GSM operators are offering more technological and attractive campaigns to customers compared with fixed-line operators. Because of these reasons, fixed-line operators are

losing current customers and can't even acquire new ones. There is a considerable decrease at customer numbers of Company X.

Because of these reasons; Company X started a CRM project in the beginning of 2009 in order to;

- Prevent customers lose
- Allow Company X to respond more quickly to changing market needs
- Increase operational efficiency
- Provide a single view of all interactions with each particular customers
- Allow creation of a Customer Experience Management program, that enables Customer Experience monitoring
- Provide significant automation to Marketing, Sales and Post-Sales Support

Company Y is the biggest ADSL (Asymmetric digital subscriber line) provider of Turkish internet market. This company also has had an acting role in Turkish telecommunication market for long years. This company has about 7 million customers. Competition is very strong at internet providing sector, especially after fiber technology, competition got stronger because fiber internet does not require fixed telephone service and also offer faster internet connection with less charge. Because of these reasons, especially at large cities where competitors make significant fiber infrastructure investments, Company Y losing customers and acquiring new customers getting more difficult. Because of these reasons Company Y decided to start a CRM implementation project in 2011. Goals of this project are same with goals of Company X.

6.1. Company X

In this section, analyze of Company X is stated. Information about CRM project of Company X are taken from eight project members, five of them are from IT department and others are from customer relationship management department. Answers of them are analyzed and dominant ones are accepted. All risky roadmap steps (CRM specific and non CRM specific steps are took into consideration) are analyzed according to actions that should be taken to prevent the failures. These actions are categorized according to answers of eight project members as:

- Completely performed (ten point)
- Partially performed (five point)
- Slightly performed (three point)
- Not performed (zero point)

Roadmap steps and situation of company X according to these steps are as follows:

Vendor Selection

Choice of vendor (Step 1.1): Company X chosen one of the best known CRM solution package on the world and also selected package was one of the expensive packages of CRM solutions. However, company X did not applied selection criteria according to objectives and functional necessities. Also most of the modules and functionalities that bought by the company were not used at the project. Also company X did not mind about integration capability of the selected product with legacy systems. During project, company X came up with some integration problems with legacy systems.
The selected package ensures a wide range of configuration capability so about configuration; the selected package is very strong.

Planning Part

Define objectives (Step 2.1): Company X created objectives of CRM before the project started but company X did not take support from a consultancy company only some individual consultants supported business units at the objective definition phase. Except customer care department, generally company X was not clear about CRM concept and objectives. Also, company X regarded CRM as an IT project rather than a strategic decision. Because of this reason, general objectives were about IT system requirements; there were not objectives such as process changes and cultural changes. Also authorities of the project only included IT and Customer Relationship departments so not all necessary authorities could be stated.
Define CRM project scope (Step 2.2): Company X selected a project manager who was not experienced about CRM projects, and not necessary authorizations were given to project manager. By the help of project manager, scope of the project was defined clearly. However, this scope was not approved by all necessary authorities because not all necessary authorities were included in the project.

As mentioned before, some important factors for CRM success should be included in the CRM project scope. Details of these factors according to company X are as follows.

- Communication channels: Company X did not state new technological channels that should be supported by CRM system technologies, only existing ones were stated at the scope. However, after implementation of CRM project, company X tried to implement new channels that were more difficult to implement after general project implementation.
- Data that will be included in the CRM system: Company X defined the data and existing source of this data that should be included in the CRM system.
- Analytical CRM necessities: Company X did not focus on analytical CRM necessities and state reports about customers and attitudes of customers. Also company X did not state the processes that aim to use these reports to take necessary actions about creating value for customers.
- Campaign Management: Company X did not state campaign management necessities in the scope of CRM project. There was a campaign management system which was developed in-house. This legacy campaign management system was not flexible and capable to support all campaign requests of marketing department but company X did not state the campaign management module revision in the project scope.

Elaborate communication plans (Step 2.3): Only staffs of Customer relationship management and IT departments that employed at the CRM project were informed about the CRM system and scope of the project. Company X did not elaborate a successful communication plan about CRM project.

Define the appropriate project organization (membership, roles, and tasks) (Step 2.4)

- Project sponsors: Vice president of Customer relationship and technology departments were stated as project sponsors however for CRM projects management support is very important. Also sponsorships should track the project progress, know the details and culture of CRM but it was not possible to say this for company X. Sponsorship concept is generally on paper at company X.
- Technical architects: Company X worked with an integrator consultancy company to get help about integration of CRM system and legacy systems. Also from legacy systems, necessary resources were dedicated for integration responsibilities.

- Project manager: Company X dedicated a project manager who was experienced on management of IT project. Company X regarded CRM system as just an IT based system and selected the project manager according to IT project management capabilities and did not focus on CRM experiences.
- Data manager: Company X did not dedicate a data manager to be responsible for customer data and cleansing activities. Data cleansing activities were managed by legacy systems' responsible staffs. Because of this reason, general situation was not managed and followed. Customer data relation between legacy and CRM systems were not managed successfully.
- Data mining manager: Company X started a business intelligent project to support marketing reports and created a department for data mining activities that formed by about twenty staffs but as mentioned at data manager part, data quality was not managed by a data manager and this deficiency also affected data mining part. Also business rules of data mining and necessary reports were not stated by business units.

Collecting end users' expectations (Step 2.5): Customer relationship management directorate of company X created requirements of CRM project. During creation of these requirements, expectations of end users were only partially used. At company X, generally processes are created by experts at the related directorates without taking the expectations of end users. End users generally try to adapt to changes that are decided by experts so end users' expectations generally are not used at company X.

Define details of objectives (Step 2.6): Customer relationship management directorate defined objectives in detail and submitted these objectives to project team. Also, business analyst team worked on these objectives with experts and consultants about solution package to understand the gaps between defined objectives and package capabilities to define the customization and development necessities. However during the project, there were problems and deficiencies about referencing to these objectives. Project team did not reference to these requirements regularly and they did not cover all these objectives.

Planning project (Step 2.7): Project manager created a project plan that included time, cost and quality details. However in addition to these factors, because of the nature of CRM projects, some details are important that should be included in the project plan for a success implementation. These details are as follows for Company X.

- Project team creation: Project team is created by company X but not all staffs from necessary departments were included in this team.
- Data cleansing: Company X did not dedicated a manager for data management but delegated legacy systems' responsible staffs for data cleansing but there was not a step as data cleansing process at the project plan. Company X could not completely clean customer related data so customer cannot be consolidated totally and between systems there were different formats and inconsistencies.
- Phases: Company X regarded CRM project as a single phased IT project and aimed to implement all functionalities at a single phase and did not create a phased plan for implementation.
- Training of the employees: Training of end users was planned at the project plan but only end users were trained. However a general training about CRM concept and culture was not planned and carried out.
- System integration tests: Project manager stated unit tests and system integration tests at the project plan but at practice integration tests were not executed perfectly because test team was created from system responsible staffs and generally they focused on their own systems and unit tests of their modules so integration tests were generally ignored.
- New processes and teams creation: At the project plan, company X did not state new processes and team creation because company X regarded CRM project as just an IT based project and new processes or necessary teams were not included at the project scope and also at the project plan.
- Promotion Management: Purchased CRM system supports promotion management processes by the help of promotion management module but Company X did not use this processes and module of the system so end users were not promoted according to system usage.

Ensure appropriate resources (Step 2.8): Company X created a competent project team that included staffs whom Company X planned to assign as CRM system operational responsible. Staffs who were possibly can deal with CRM system such as business analysts and operational support teams were delegated as project team member to be familiar with the concept of CRM system, technical specialties and configuration processes.

Launching CRM project web site on the company intranet (Step 2.9): Company X did not create a web site for CRM project. CRM was not regarded as a cultural change and strategic decision so this step was not regarded as an important and necessary step.

Design Part

Technical design (Step 3.1): Company X worked with a consultancy company about technical design which was also a software company that created solutions for company X. Company X were using variety of legacy systems some of which were developed by this consultancy company so this was a plus for creating integration model and architecture for. According to this information, technical design can be regarded as successful but after implementation of system, there were some integration problems and system was working very slowly because of integration problems. End users complained to operational support teams about this situation very frequently because they could not complete their processes in time because of these problems.

Interface design (Step 3.2): Interfaces of the system that purchased by the company X was designed appropriately and company X did not need to re-design the interfaces of the system. However some configurations at the screens were made according to requirements but general structure of the interface was not changed. There was not any complaint about interface design of the system from end users.

Customization and upgrading of the CRM software (Step 3.3): Company X generally uses IT systems that are developed in house according to processes of the company so package program using culture is not usual for Company X. Business units also do not want to adapt their processes to IT system structures and want to customize the systems according to existing processes and structure of the company. Also as mentioned before, company X regarded CRM project as an IT project and did not want to change existing processes significantly for this project. As a result, project team needed to customize the package according to existing processes and requirements. For some modules, standard structure of the system was changed significantly which made the upgrading process very difficult or impossible.

Controlling the results of work packages (give the order to go or not go in terms of technical aspects) and ensuring the quality (Step 3.4): Company X did not use a phased structure so there were not work packages that can be controlled.

Setting of the software package (Step 3.5): Company X hired consultants of system that is purchased. These consultants helped to IT staffs about configuration of the system according to business requirements. Also consultants trained the IT team that will be responsible for the system configuration processes according to changing business requirements and customer needs.

Integration tests (Step 3.6): There were some performance problems about integration points with legacy systems. Process times for some processes were so high so it was difficult for end users to work with the system. Project team did not execute performance tests about integrations successfully so necessary precautions could not be taken and corrections could not be made about these problems. Also there were some problems that occurred because of some data inconsistencies between systems which were the results of unsuccessful data cleansing process.

Project piloting and controlling (Step 3.7): Company X piloted the project at a single province before implementing the system for all end users and for all customers. However controls did not performed successfully and because of this reason performance problems of integration and data inconsistencies could not be observed and as a result necessary correction actions could not be taken.

Training of volunteering relay (Step 3.8): Company X managed end users' training step professionally. There is a special directorate that is responsible for training and career planning of employees, so by the help of this directorate and consultants, end users training step was performed completely. However, company X only trained employees about system usage but did not train them about the CRM strategy and concept.

Communication with top management and local managers (Step 3.9): As mentioned before company X regarded CRM project only related with IT and customer relationship management directorates. Because of this reason, only managers of these departments' were communicated by the project team.

Communication within agencies by the help of regular meetings, hotline, flashes and newsletters (Step 3.10): Project manager of CRM managed this step successfully, regular meetings were held to share the statue of the project between project members, responsible managers and sponsors of the project.

Business Process Reengineering (BPR) deployment (Step 3.11): This step is one of the most important steps of CRM projects. As mentioned before, CRM consists of three important

issues (section 4) which are, human, processes and technology. According to CRM strategy, companies should create new processes and change existing ones when necessary. However company X did not regard CRM project as a strategic decision so did not include process changes, new process creations or cultural change necessities at the project scope.

Rolling Out

Usage evaluation (Step 4.1): End users had some problems because of slowness of the system. End users declared these problems to operational support teams. However company X could not take any action about these problems except increasing the server capacities. The problem was about integration architecture so company X could not solve the problem permanently. Company X performed this step but could not take any action that can solve the problems totally.

Evaluation of end users training (Step 4.2): By the help of training and career planning directorate, Company X evaluated end users' training. As a standard procedure, training and career planning directorate evaluate the training of participants by on paper exams and on work trials.

Institutional communication of success through Intranet and newsletter (Step 4.3): Company X published the successful implementation of CRM system from intranet web site of the company, also an e-mail published about this implementation; however the content of these messages were as an IT project announcement instead of a strategic action and cultural change content.

Table 12: Result Summary of Company X

	COMPANY X
Vendor Selection	
Choice of vendor (Step 1)	HF3-A1→ 10 points **PF3-A1→ 10 points** HF3-A2→ 0 points
Planning Part	
Define objectives (Step 2)	HF5-A1→ 0 points **HF5-A3→ 3 points** HF2-A1→ 5 points **HF5-A4→ 10 points** **TF1-A1→ 0 points**
Define CRM project scope (Step 3)	HF4-A1→ 3 points **PF2-A1→ 10 points** HF2-A2→ 3 points **PF1-A1→ 0 points** **HF5-A5→ 3 points** **HF5-A6→ 3 point**
Elaborate communication plans (Step 4)	HF2-A3→ 0 points **HF1-A1→ 3 points**
Define the appropriate project organization (membership, roles and tasks) (Step 5)	HF4-A2→ 5 points **PF2-A2→ 3 points** HF1-A2→ 5 points **PF2-A3→ 5 points** TF2-A1→ 3 points
Collecting end users' expectations (Step 6)	TF1-A6→ 0 points
Define detailed objectives (Step 7)	HF5-A7→ 10 points HF5-A2→ 5 points
Planning project (Step 8)	HF1-A3→ 3 points **PF2-A4→ 5 points** TF2-A2→ 0 points **TF1-A3→ 0 points** TF2-A3→ 3 points **TF1-A4→ 5 points** TF1-A2→ 0 points
Ensure appropriate resources (Step 9)	HF1-A4→ 10 points
Launching CRM project web site on the company intranet (Step 10)	**TF1-A5→ 3 points**
Design Part	
Technical design (Step 11)	TF2-A4→ 5 points
Interface design (Step 12)	TF1-A7→ 10 points
Customization and upgrading of CRM software (Step 13)	TF3-A1→ 0 points TF3-A2→ 0 points
Controlling the results of work packages (Step 14)	TF2-A5→ 0 points
Integration tests (Step 16)	TF2-A6→ 5 points
Project piloting and controlling (Step 17)	TF2-A7→ 5 points
Communication with top management and local managers (Step 19)	HF2-A4→ 5 points
Communication within agencies by the help of regular meetings, hotline, flashes and newsletters (Step 20)	HF1-A5→ 10 points
Business Process Reengineering(BPR) deployment (Step 21)	TF1-A8→ 0 points **HF1-A6→ 0 points** TF1-A9→ 0 points
Rolling Out Phase	
Usage evaluation (Step 22)	PF3-A2→ 5 points
Evaluation of end users training (Step 23)	TF1-A10→ 10 points
AVERAGE OF ALL ACTIONS	= (183/470) * 100 = 38,9
AVERAGE OF CRM SPECIFIC ACTIONS	= (63/160) *100 = 39,38
AVERAGE OF NON CRM SPECIFIC ACTIONS	= (120/310) * 100 = 38, 71

At the end of this analysis, scores of Company X for critical actions are collected. The result of this analysis is shown at Table 12. CRM specific actions are stated with bold characters and non CRM specific actions are stated with normal characters.

As can be seen from the analysis that made on company X, company X does not adapt to preventive actions of the road map significantly. The total point that can be gathered is **470** and company X gathered **183** out of **470** that is under the midpoint. According to this result, Company X covered only **38.9%** of the preventive actions. This analysis is made with the just CRM specific and non CRM specific actions that are stated at the table with bold and non-bold characters. Company X covered **39.38%** of the CRM specific actions and **38.71%** of the non CRM specific actions. As can be seen, CRM specific, non CRM specific and general actions coverage ratios are very close to each other. According to this analysis, project failure of company X is predictable. The real situation of company X after implementation of CRM system is analyzed by the help of project team again. Expectations of company X from CRM project and comments about these expectations that made by project experts are as follows.

- Prevent losing customers: Company X could not decrease churn rate on the contrary it was increased according to the ratio that was before the CRM implementation project.
- Allow Company X to respond more quickly to changing market needs: Company X could not respond to market needs more quickly because there was no process to analyze the changing customer needs which can be possible with analytical CRM. Also company X did not change the culture and structure of the company to obtain this flexibility.
- Increase operational efficiency: Company X did not make large scaled changes about business and operational processes so at the end of the project, company X could not obtain a significant progress on operational efficiency.
- Provide a single view of all interactions with each particular customer: By the help of CRM system, company X obtained a single view of customers and because all interactions were triggered from CRM system, all interactions could be viewed from CRM system. However the culture and other necessities of CRM system were not explained to staffs that interact with customers. As a result users did not realize the importance of these interactions and not all interactions were registered to the system.

- Allow the creation of a Customer Experience Management program, where the Customer Experience can be monitored and acted upon: As mentioned before, company X did not create analytical CRM functionalities also a customer experience management system did not created.
- Provide significant automation to Marketing, Sales and Post-Sales Support: By the help of CRM system, company X automated some of the processes that interact with customers but these changes and automations were not large scaled changes and automations. Project team could not change or add new processes which require large scaled changes on current work attitudes of the departments and teams. A cultural and strategic change could not be triggered for CRM project so changes about this aim were remained limited.

According to opinions of project members, company X attained a failed result that is about **32%** of its goals. This value is the average value of the values that the project members of company X stated about the project success rate. Company X is now looking for another solution for CRM system and planning to start another CRM implementation project which means company X accepted the failure of CRM project.

6.2. Company Y

Information about CRM project of Company Y was taken from 7 project members. 5 members are from requirement management and analyses team and 2 members from business side. Also a consultant, who is a manager at software and Consultancy Company that created the CRM solution, helped about this analyze. Roadmap steps are analyzed according to actions that should be taken to prevent the failures. At the end of this analyze, actions are categorized as:

- Completely performed (ten point)
- Partially performed (five point)
- Slightly performed (three point)
- Not performed (zero point)

Roadmap steps and situation of company Y are as follows:

Vendor Selection

Choice of vendor (Step 1.1): Company Y chose a CRM solution package that is created by a Turkish software company which was also a consultancy company about CRM projects. This solution package was created specifically for service sector such as telecommunication sector. This software company was very familiar with Turkish telecommunication sector and also familiar with company Y. Also, some of the legacy systems of company Y were developed by this company. Because the solution package was created according to service sector and created by the help of know-how about Turkish telecommunication sector, package was very appropriate according to necessities of company Y. Also, solution package was very powerful about integration capabilities with legacy systems of company Y. Integration responsibilities of CRM with legacy systems was dedicated to Consultancy Company and they performed this responsibility successfully. Selected package was configurable enough for a CRM solution.

Planning Part

Define objectives (Step 2.1): Company Y has a dynamic and customer centric structure so company Y is conscious about customers and customer satisfaction. Internet sector has a more competitive structure. Employees and executives of Company Y are aware about CRM concept. Also they took help from a consultancy company that was experienced about CRM concept, telecommunication sector and software solutions.

Company Y aimed to create a more customer centric structure and also support this aim with an appropriate CRM system. As mentioned before, internet sector is more competitive and to be successful at this environment, it is important to have a customer centric structure for company Y and company was aware about this reality. Their strategy was to have a more customer centric structure. Business units of company Y created objectives of CRM project and also as mentioned before, company Y took support from a consultancy company while creating these objectives. Customer relationship management, marketing management and information technologies vice president ships took action together at objectives creation step. Also customer centric strategy is a general strategy of the company that is supported by whole company and senior management of the company.

Company Y was conscious about new process necessities for CRM concept and these necessities were also took part at the objectives of CRM project. Senior management of company Y supported customer centric actions and processes so management support was very strong for the CRM project.

Necessary processes, new teams and organizational units were stated at the objectives of the CRM project and approval of executive management was taken for these changes. Company Y selected a project manager and stated the authority level of project manager according to high level objectives of CRM project so project manager could take necessary action easily for the success of project.

Define CRM project scope (Step 2.2): Company Y selected two project managers who were experienced about CRM projects. Necessary authorization was given to project managers by the company Y to make necessary changes on processes, structure and culture. By the help of project managers, scope of the project was defined and approved by all responsible authorities.

Some important factors for CRM success should be included in the CRM project scope. The steps that should be included in the CRM project scope and details of these steps according to company Y are as follows.

- Communication channels: Company Y included new technological channels that could be supported by CRM system technologies such as SMS channels and smart phone applications at the project scope. Also existing channels were included at the scope such as call center, e-mail and web online channels.
- Data that will be included in the CRM system: Company Y defined data and existing source of these data that should be included in the CRM system.
- Analytical CRM necessities: Company Y regarded CRM not just as an IT project but also as a strategic action that need to be supported by analytical CRM capabilities. Marketing and customer relationship management departments were conscious about analytical CRM importance and abilities that can be used for long term competence in the market. As a result, they focused on analytical CRM necessities. Also company Y investigated some new technological tools to analyze the usage routines of customers that can feed the analytical CRM reports. Also by marketing

department, processes that will use the results of analytical CRM results were created to obtain competitive advantage. Also company Y informed all end point users about the importance of interaction records of customers. The aim of Company Y was supporting the data gathering about customer interactions that can be used by analytical CRM.

- Campaign Management: Company Y was using a campaign management system which was developed by the software company from which company Y purchased CRM solution.

  Software Company embedded a more sophisticated and modular campaign management module to their CRM solution and company Y also purchased this module. This module was an accumulation of know-how about telecommunication sector and Turkish market conditions so solution was including necessary specifications and functionalities for company Y.

Elaborate communication plans (Step 2.3): Company Y had a customer centric structure and culture and known the importance of adoption of CRM culture by all staffs of the company especially by staffs that directly interact with customers.

Company Y organized a general instruction session for selected employees from all departments to increase the adoption of the project and CRM concept over whole company. Company Y elaborated a successful communication plan about CRM project.

Define the appropriate project organization (membership, roles, and tasks) (Step 2.4)

- Project sponsors: Company Y determined customer relationship department, technology department and marketing department vice presidents as project sponsors. Culture of company Y was customer centric and executive management gave importance to CRM project and sponsors were concerned with the progress of the project. Also, sponsors supported the CRM project management team, when necessary.
- Technical architects: Company Y worked with a consultancy company which was also the company that company Y purchased CRM solution from. Consultancy Company helped to company Y about integration of the system with legacy systems. Consultancy Company is a solution provider for telecommunication sector and also some of the legacy systems of Company Y are products of this company so

they are familiar with these legacy systems. Because of these reasons, integration planning process was very easy for Integrator Company. According to integration tests and performance of integrations between systems, it can be interpreted that, technical structure of CRM system is strong.

- Project manager: Company Y dedicated a successful project management group for the CRM system implementation project. There were two project managers, one was responsible for technical side and other was responsible for business side. Technical problems were cared by technical project manager and business problems were cared by business side project manager. Project managers were very experienced about CRM concept and project management.
- Data manager: There was a data manager that manages the data quality and data consistency between systems at company Y. Company Y gave the responsibility of customer data management to data manager. Also company Y dedicated a business responsible, for data cleansing process that gave business decisions about data cleansing processes and rules that ensure the data cleanliness. Data manager was also responsible for necessary reports and analytical CRM processes. Knowing about data and data model, made the analytical CRM reposts and processes easier and more manageable for the data manager.
- Data mining manager: Data manager of company Y was also responsible for analytical CRM reports and data mining. However, data mining team was not big enough that was formed by a manager and four staff that were responsible for data mining and cleansing activities so team size was not enough for analytical CRM activities for a telecommunication company that has various and huge amount of customer data.

Collecting end users' expectations (Step 2.5): Customer relationship management and marketing management vice president ships of company Y created the requirements about CRM system. They created these requirements by the help of expectations of end users and freelance experts however end users expectations did not affect the general concept of requirements.

Define details of objectives (Step 2.6): Customer relationship management and marketing vice president ships defined objectives in detail and submitted these detailed objectives and requirements to project team. Also business analyst team worked on these objectives

with experts and consultants about solution package to understand the gaps between defined objectives and package capabilities to define the customization necessities.

Planning project (Step 2.7): The project management team created a project plan according to necessities and bounds of the project that was stated by management of company Y. However, because of the nature of CRM projects, some details are important that should be included in the project plan for CRM project success, these details of company Y are as follows:

- Project team creation: Responsible staffs from all related departments were included in the project team. Team was created after project manager had been specified.
- Data cleansing: Company Y dedicated two responsible staff for data cleansing. One of them was a manager from technical side and the other one was from business side to take the decisions about data cleansing activities. Also project management group added data cleansing activities to the project plan which was started at the beginning of the project and ended before the systems implementation, so according to project plan, it was aimed to migrate the cleaned data to CRM system from legacy systems. At the end of data cleansing activities, company Y created a consolidated and single customer data repository which increased CRM system efficiency. Also, company Y integrated CRM system with necessary external systems such as Turkish Registration Office to control and take the necessary demographic customer data automatically and Turkish Central Address System to create a correct address repository. First and foremost, company Y created necessary processes and controls to protect the customer data clean and consistent with other systems.
- Phases: Company Y aimed to implement following CRM modules with a phased project plan but started to use the system at the end of all modules completed so they start to use all modules together.
    - Campaign management module
    - Trade promotion management module
    - Lead management module
    - Segmentation and risk management module
    - Marketing resource management module
    - Service order management module
    - Complaints and returns management module
    - Channel management module
    - Analytics module

- Training of the employees: End users' training was planned at the project plan but only end users were trained, not a general training about CRM concept and culture was planned and carried out for all employees. However company Y trained some employees from all departments to create adoption about CRM system and CRM concept. Also company Y made general notifications for whole company about new processes that were crated for CRM project such as appointment process and cargo process.
- System integration tests: Company Y dedicated Consultancy Company as system integration responsible and Consultancy Company managed this responsibility according to project plan. Also company Y dedicated necessary responsible staffs from relevant systems to support Consultancy Company about integration processes and tests. Project managers stated unit tests and system integration tests at the project plan. Also Consultancy Company had know-how about legacy systems of company Y that made the integration test process easier and successful.
- New processes and teams creation: At the project plan, company Y did not state new processes and teams creation but these responsibilities were dedicated to relevant departments. These new processes and teams creations were included at the project scope but not included in the project plan. Company Y dedicated these actions to relevant departments such as field teams for cargo processes or installation teams for appointment processes. However not all processes and teams were created successfully, because relevant departments could not manage this responsibility properly.
- Promotion management: Solution that Company Y purchased is supporting promotion management by a separate module and this module also is purchased by Company Y. Company Y used this ability and created necessary financial processes to create user promotion process to stimulate end users.

Ensure appropriate resources (Step 2.8): Company Y created a competent project team including staffs that company Y planned to delegate as operational responsible of CRM system. Business analysts and operational support teams were also delegated at the project team to be familiar with the concept of CRM system but as mentioned before, for analytical CRM responsibilities, company did not create a quantitatively sufficient team.

Launching CRM project web site on the company intranet (Step 2.9): Company Y did not create a web site specifically for CRM project. Company Y used their intranet web site for informing about CRM project as other big and important projects.

Design Part

Technical design (Step 3.1): Company Y worked with a consultancy company about technical design process which was also the software company that company Y purchased CRM solution from. Also as mentioned before, responsibility of integration tests and problems was also dedicated to this company and these problems were minimized by the help of know-how of legacy systems and strong technical design.

Interface design (Step 3.2): Interface of the system that purchased was designed appropriately for channels structures of telecommunication sector and necessities of these channels. Generally company Y did not need to re-design the interfaces of the system. The system support interface redesign processes because system was configurable so change requirements about interface design could be managed in case of necessity. There was not any complaint about interface design of the system.

Customization and upgrading of the CRM software (Step 3.3): The purchased CRM solution by company Y is developed by a Turkish software company that has know-how about Turkish telecommunication sector and environment so solution package is very appropriate according to requirements of company Y and sector necessities. Also company Y was ready for make necessary structural and cultural changes on processes and teams instead of customizing the system. Goal of company Y was to implement a best practice solution for CRM. Business units were willing to adapt to IT system structure and willing to change the existing processes and structure of the company. Co. As a result, necessary changes on processes and teams planned by relevant units of company, so customization level was ignorable.

Controlling the results of work packages and ensuring the quality (Step 3.4): Project team and technical design responsible company performed this step successfully. Consultancy Company is qualified about IT solutions and technical issues and familiar with the as-is situation of company Y. Because of these reasons, they could manage this step successfully.

Setting of the software package (Step 3.5): Company Y worked together with the software company during the project. Consultancy Company also helped about making the necessary

settings and configurations to make the system appropriate for business requirements. Also Consultancy Company trained the IT team that will be responsible for the system configuration processes according to changing business requirements and customer needs.

Integration tests (Step 3.6): Integration and integration tests were responsibilities of Consultancy Company. Consultancy Company completed integration tests successfully by the help of responsible staffs of relevant IT systems. Company Y did not face any major integration problem during the tests and after the implementation. Also data consistency was responsibility of data manager, who performed his responsibility about this issue successfully so there was not any major problem because of data inconsistency between systems.

Project piloting and controlling (Step 3.7): Company Y piloted the project at a single province before implementing the system for all end users and customers. Company Y and Consultancy Company performed controls successfully and necessary corrections were managed successfully.

Training of volunteering relay (Step 3.8): Company Y managed end users' training step professionally. The consultancy company that from whom company Y purchased CRM solution trained the volunteering relays or key users but company Y only trained these key users. These key users trained all relevant employees and end users about CRM system.

Communication with top management and local managers (Step 3.9): As mentioned before, customer relationship department, IT department and marketing department executive management were sponsors of this project and also they tracked the progress of the project in detail. Project team communicated with all related managers about the progress of the project and about changes and necessary actions that should be taken by their teams or departments.

Communication within agencies by the help of regular meetings, hotline, flashes and newsletters (Step 3.10): Project managers of CRM, managed this step successfully. Regular meetings were hold to follow the statue of the project between project members and related managers of the company.

Business Process Reengineering (BPR) deployment (Step 3.11): Company Y stated the necessary process changes and necessary new processes at the beginning of the project to be followed and managed by the relevant departments. They did not manage these changes on the CRM project plan but they were managed by the teams of relevant

departments, parallel with the CRM project. Also CRM project management team was informed regularly about the progress of these changes however relevant departments could not managed these changes successfully and some of these processes could not be completed before the implementation of the CRM system.

Rolling Out

Usage evaluation (Step 4.1): During piloting phase, company Y collected end users' opinions about the system and functionalities. Also company Y collected opinions of end users during the training and some necessary actions were taken according to their opinions. Company Y regarded the opinions of end users and evaluations of them about the system. Also as mentioned before, company Y created a promotion management process to evaluate and promote usage of system by end users.

Evaluation of end users training (Step 4.2): Company Y did not evaluate training of end users' except evaluation forms that distributed after trainings. However company Y did not took any action according to these evaluation forms.

Institutional communication of success through Intranet and newsletter (Step 4.3): Company Y published CRM project initiation from intranet web site of the company and also an e-mail published about this project. Information about customer centric culture was included at this e-mail and web site informative. Also company Y published the successful implementation of CRM system with intranet web site of the company and e-mail.

Table 13: Result Summary of Company Y

	COMPANY Y
Vendor Selection	
Choice of vendor (Step 1)	HF3-A1→ 10 points **PF3-A1→ 10 points** HF3-A2→ 3 points
Planning Part	
Define objectives (Step 2)	HF5-A1→ 10 points **HF5-A3→ 10 points** HF2-A1→ 10 points **HF5-A4→ 10 points** **TF1-A1→ 10 points**
Define CRM project scope (Step 3)	HF4-A1→ 10 points **PF2-A1→ 10 points** HF2-A2→ 10 points **PF1-A1→ 10 points** **HF5-A5→ 10 points** **HF5-A6→ 10 points**
Elaborate communication plans (Step 4)	HF2-A3→ 10 points **HF1-A1→ 10 points**
Define the appropriate project organization (membership, roles and tasks) (Step 5)	HF4-A2→ 10 points **PF2-A2→ 10 points** HF1-A2→ 10 points **PF2-A3→ 3 points** TF2-A1→ 10 points
Collecting end users' expectations (Step 6)	TF1-A6→ 5 points
Define detailed objectives (Step 7)	HF5-A7→ 10 points HF5-A2→ 5 points
Planning project (Step 8)	HF1-A3→ 10 points **PF2-A4→ 10 points** TF2-A2→ 10 points **TF1-A3→ 10 points** TF2-A3→ 10 points **TF1-A4→ 3 points** TF1-A2→ 5 points
Ensure appropriate resources (Step 9)	HF1-A4→ 5 points
Launching CRM project web site on the company intranet (Step 10)	**TF1-A5→ 3 points**
Design Part	
Technical design (Step 11)	TF2-A4→ 10 points
Interface design (Step 12)	TF1-A7→ 10 points
Customization and upgrading of CRM software (Step 13)	TF3-A1→ 10 points TF3-A2→ 10 points
Controlling the results of work packages (Step 14)	TF2-A5→ 10 points
Integration tests (Step 16)	TF2-A6→ 10 points
Project piloting and controlling (Step 17)	TF2-A7→ 10 points
Communication with top management and local managers (Step 19)	HF2-A4→ 10 points
Communication within agencies by the help of regular meetings, hotline, flashes and newsletters (Step 20)	HF1-A5→ 10 points
Business Process Reengineering(BPR) deployment (Step 21)	TF1-A8→ 5 points **HF1-A6→10 points** TF1-A9→ 5 points
Rolling Out Phase	
Usage evaluation (Step 22)	PF3-A2→ 10 points
Evaluation of end users' training (Step 23)	TF1-A10→ 3 points
AVERAGE OF ALL ACTIONS	= (405/470) * 100= 86,2
AVERAGE OF CRM SPECIFIC ACTIONS	= (139/160) * 100= 86,88
AVERAGE OF NON CRM SPECIFIC ACTIONS	= (266/310) * 100=85, 81

At the end of this analysis, scores of Company Y for critical actions are collected. The result of this analysis is shown at Table 13. CRM specific actions are stated with bold characters and non CRM specific actions are stated with normal characters.

As can be seen from the analysis that made on company Y according to extended road map, company Y significantly adapted to the preventive actions that stated on the extended road map. The total point that can be gathered is **470** and company Y gathered **405** point out of **470** that is over the midpoint. Also, this analysis is made with the just CRM specific actions and not CRM specific actions. According to this result, Company Y covered **86.2%** of all actions on the road map. Company Y covered **86.88%** of CRM specific actions and **85.81%** of non CRM specific actions. As can be seen from these values, CRM specific actions, non CRM specific actions and general actions coverage ratios are very close to each other. Also if it is focused only failure reasons that are stated according to literature and expert opinions, company Y generally completed these steps successfully. According to this analysis success of CRM implementation of company Y is predictable.

The real situation of company Y after implementation of CRM system is analyzed. Expectations of company Y from CRM project and comments about these expectations that made by project experts are as follows.

- Prevent losing customers: Company Y increased the retention ratio by the help of successful campaigns that made by the help of analytical CRM and campaign management module of CRM system. Company Y successfully used usage routines of customers and created successful campaigns and new packages according to this knowledge. Also company Y increased the customer acquisition ratio by the help of campaigns for new customers.
- Allow Company Y to respond more quickly to changing market needs: Company Y could respond to market needs more quickly by the help of analytical CRM analyses and flexibility of CRM system. For example creating and running a new campaign or a new package to market only takes maximum one hour.
- Increase operational efficiency: Company Y made necessary structural and process related changes to increase customer satisfaction ratio and operational efficiency of the company. Company Y increased operational efficiency by the help of these new processes and new structure, for example connection of a new line could be completed by the help of

cargo and appointment processes. However as mentioned before some necessary processes could not be completed by relevant departments before project implementation.

- Provide a single view of all interactions with each particular customer: By the help of CRM system, company Y obtained a single view of customers and because all interactions were triggered from CRM system, all interactions could be viewed from CRM system.
- Allow the creation of a Customer Experience Management program, where the Customer Experience can be monitored and acted upon: Company Y created analytical CRM functionalities that helped to gather necessary data, create necessary reports and create processes that analyzed. Also Company Y took action according to these analyses. By the help of analytical CRM, company Y created a customer experience management program that is managed by marketing department.
- Provide significant automation to Marketing, Sales and Post-Sales Support: By the help of CRM system, company Y automated some of the processes that interact with customers. Some examples are cargo processes, self-interaction internet applications for subscription processes, appointment processes and campaign offering engines which are large scaled changes and automations. Also, by the help of integrations between systems, necessary controls are made automatically such as debt controls, defect controls and so on which also increase the operational efficiency at the customer communication points.

As a result, it can be stated that company X attained a successful result about **83%** of its goals which is the average value of the values that the experts of company X stated about the project success rate.

6.3. Discussion about Findings

According to analyses of the results, company X covered about 38.9% of all actions and 39.38% of just CRM specific actions on the extended road map steps. Company Y covered about 86.2% of all actions and 86.88% of just CRM specific actions on the extended road map steps. As mentioned before, success ratio of Company X is 32% and success ratio of Company Y is 83%.

Table 14: Comparison of Company X and Company Y for All Actions

Company	Action coverage percentage	Project Success Percentage
Company X	38, 9	32
Company Y	86, 2	83

Table 15: Comparison of Company X and Company Y for CRM Specific Actions

Company	Action coverage percentage	Project Success Percentage
Company X	39, 38	32
Company Y	86, 88	83

Summary of this analyses are shown at Table 14 and Table 15.

For Company X and Company Y, action coverage rates of all actions and just CRM specific actions are very close to each other. Because of this reason, it can be assumed that relationship between project success ratio and coverage ratio of all actions is same with relationship between project success ratio and coverage ratio of just CRM specific actions.

Coverage ratio of all actions and just CRM specific actions coverage ratio have the same interaction function with the project success ratio, so one of them can be used for analysis. All actions coverage ratios and project success ratios are selected to analyze.

By the help of Chi Square analyses it can be said that, between road map actions coverage ratio and project success ratio, there is a relation that is not arbitrary with a 95% confidence level. As a result, it can be interpreted that, between just CRM specific road map actions coverage ratio and project success ratio; there is a strong relationship so proposed road map can provide success for CRM projects. If a company performs all critical actions on the road map, by the help of regression analysis and results of company X and Y, it is expected to get a 98.5% success. If 70% or an above success percentage is interpreted as a successful result, by the help of standard distribution analysis, expected failure probability is calculated as smaller than 0.01%. Details of these statistical calculations are stated in Appendix B: Statistical Calculations.

7. CONCLUSION

7.1. Summary

Customers are more selective and powerful than ever before so market is more competitive than ever before. This situation is stronger for telecommunication sector, because telecommunication sector's customers are more conscious about service qualities and prices. They are more interested about social networks and internet technologies that make price and quality analyses easier and more effective. Also at telecommunication sector by the help of regulative obligations, customers can easily shift between service providers.

Competition with price is very difficult for telecommunication companies. Competition that is only supported with price discounts causes a difficult situation for companies with very small profit margins that is difficult to sustain for a long time. As a result, it is important to compete with quality of services and customer centric structures. Customer centric structure is possible by knowing the customers and their needs and by creating services, campaigns, products and processes according to their needs. These are all possible with a successfully implemented CRM system.

Because of these reasons, CRM systems are very popular for telecommunication companies. They spend big amount of money for CRM solution packages and consultancies about CRM to increase satisfaction ratio of their customers and increase their competitive advantages. However success ratio of CRM projects is not high as other IT based projects. Failure ratio of CRM projects at telecommunication companies is higher because there are some special difficulties for CRM projects at telecommunication sector such as customer data volume, customer related process variety and variety of legacy systems.

The aim of this thesis is to propose a road map elaboration for CRM implementation projects that can be referenced to increase the success ratio of CRM projects. For this aim, following steps are completed:

1. CRM concept is specified by the help of literature reviews. Also goals of CRM projects are clarified to analyze the failure reasons more effectively
2. Specifications and difficulties of CRM projects for Telecommunication sector are stated according to literature reviews
3. Failure reasons and preventive actions for these failures are specified according to literature reviews, interviews and questionnaires that are made with CRM experts
4. Preventive actions and critical points are mapped on CRM implementation road map steps to propose a road map elaboration
5. Proposed road map elaboration is verified by statistically analyzing two CRM projects from telecommunication sector

According to literature reviews, interviews and questionnaires, there are 11 main factors of high failure rates. These factors are categorized in three main groups as processes (**PF**), technology (**TF**) and human (**HF**). These factors are as follows:

- **TF1**→Regarding CRM as a pure technological solution
- **HF1**→Organizational and cultural change difficulties
- **PF2**→Ignorance of data quality
- **HF4**→Project management difficulties
- **PF1**→Ignorance of knowledge management processes
- **HF2**→Lack of support from relevant departments
- **TF2**→Ignorance of system integration
- **PF3**→Ignorance of CRM improvement processes
- **HF5**→Not clear objectives
- **HF3**→Consultancy selection mistakes
- **TF3**→Excessive customization

On the proposed road map elaboration, preventive actions are stated. CRM specific important actions and critical points of road map elaboration are as follows:

- Having know-how about CRM concept and having ability to determine objectivities of CRM project clearly is very important. CRM concept generally regarded as just an IT based project and other important factors are generally ignored. CRM concept includes three important factors that should be included. These factors are as follows:
  - Technical factors
  - Human factors
  - Process factors
- Data and data management is very important for CRM concept especially for telecommunication companies that has various and huge amount of customer related data. Data cleansing activities, conserving the data cleanliness and consistency between systems and acquiring as much as possible data about customers are also very important.
- CRM includes two main parts as analytical CRM and operational CRM. Companies generally focus on operational CRM and ignore analytical CRM which is very important for telecommunication companies. Telecommunication companies should not only focus on operational CRM but also on analytical CRM. Because of analytical CRM necessities, data gathering processes and activities about customers are also more important for Telecommunication companies.
- Campaign management is very important for telecommunication companies because competition is very strong for telecommunication sector. Telecommunication sector companies should focus on campaign management and include campaign management in the CRM project.
- Integration architecture is very important for CRM systems especially for telecommunication companies that have lots of customer related systems. Integration problems and integration errors can cause the failure of CRM system so companies should care about integration architecture of CRM system.
- Processes are very important for CRM concept; customer centric processes should be implemented to support CRM concept and customer centric strategy of companies. Companies generally regard CRM project as a pure IT project and do not include necessary process changes and new process creations in the CRM projects.

- CRM project is a strategic decision and this decision should be supported by senior management and whole company.
- Human factor in other words employees are very important for CRM system and customer centric strategy. Human factor is important especially for telecommunication companies that have lots of channels that directly interact with customers. Attitudes of employees are very important because their attitudes against customers directly affect the idea of customers about company. Employees are also very important at data management and data gathering processes. Companies should educate employees about customer centric strategy and CRM concept.
- Channels are very important especially for telecommunication companies. There are various contact channels for Telecommunication companies. Telecommunication customers are generally technology addicted and want to perform their transactions from all technologically supported channels so companies should support all of these channels and include these channels in the CRM project.
- Selecting an appropriate project manager, Consultancy Company and CRM product are also important for project success. Project manager should manage not only IT side but also business side of the project because CRM is not a pure IT system implementation project. Also Consultancy Company should be familiar with CRM concept and telecommunication sector. Selected CRM product should be easily integrated with other legacy systems and be appropriate for business requirements to decrease the customization ratio.

After proposing the road map elaboration, two telecommunication companies that implemented CRM system are investigated for extended road map evaluation. By the help of this analysis and some statistical calculations, accuracy and confidence level of the road map elaboration is examined. According to these analyses, it is resulted that with a 95 % confidence level, proposed road map elaboration ensures the success of the CRM project at Telecommunication sector.

7.2. Future Work

As future work, following steps can be completed:

- At this thesis work, CRM systems are analyzed for Telecommunication sector companies. As future work, other sectors such as banking and electricity providing sectors can be analyzed because CRM systems are also very popular for these sectors.
- While examining the proposed road map elaboration, only two CRM projects from Turkish Telecommunication sector (Company X and Company Y) could be analyzed. As future work, proposed road map elaboration can be examined by the help of results of some other CRM implementation projects.
- Big data projects are very popular that aims to consolidate all databases of companies to create comprehensive and in depth reports. By the help of big data, customer related reports also can be created. Analytical CRM and big data has similar aims. As future work, big data projects can be analyzed in detail because big data can be very help for analytical CRM.
- This thesis work is started with a literature work and the survey that made with 45 sector expert is crated according to literature work results. As a future work, Delphi technique can be used to explore the failure reasons of CRM projects directly from CRM experts.

8. REFERENCES

1 Adel Beldi, Walid Cheffi and Prasanta K.Dey (2009). Managing customer relationship management projects: The case of a large French telecommunication company. *International Journal of Project Management: Changes & Projects, 28,* 339–351

2 Ahlemann F. (2009). Towards a conceptual reference model for management information systems. *International Journal of Project Management: Changes & Projects, 27,* 19-30

3 Aurora Garrido-Moreno, Antonio Padilla-Melendez (2011). Analyzing the impact of knowledge management on CRM success: The mediating effects of organizational factors. *International Journal of Project Management: Changes & Projects, 31,* 437-444

4 Baltzan P., Philips A., Haag S., McGraw-Hill. Irwin (2006). *Business Driven Technology,* Denver: University of Denver

5 Beijerse, R.P. (1999). *Questions in KM: Defining and conceptualizing a phenomenon*, The Netherlands: MCB UP Ltd

6 Bob Thompson (2004). *Successful CRM: Turning customer loyalty into profitability*

7 Brown, S.A. (2000). *Customer Relationship Management-A Strategic Imperative in the World of E-Business*, USA: Wiley

8 Bull, C. (2003). Strategic issues in customer relationship management (CRM) implementation. *Business Process Management Journal*, 9, 592-602

9 Bygstad, B. (2003). The implementation puzzle of CRM systems in knowledge based organizations. *Information Resources Management Journal,* 16, 13 pages

10 Carlsson, C. and Walden, P. (2000). Intelligent support systems-the next few DSS steps. *Human Systems Management,* 19,135-147

11 Chalmeta R. (2006). Methodology for customer relationship management. *Journal of Systems and Software:* Special Issues, 79, 1015-1024

12 Chen, I.J., Popovich, K. (2003). Understanding customer relationship management (CRM): people, process and technology. *Business Process Management Journal*, 9, 672-688

13 Corner, I., Hinton, M. (2002). Customer Relationship Management systems: implementation risks and relationship dynamics. *Qualitative Market Research: An International Journal*, 5, 239-251

14 CSO Insights (2006). Sales Performance Optimization-2006 Survey Results and Analysis, Boulder

15 Dous, M., Kolbe, L., Salomann, H.&Brenner, W. (2005). KM capabilities in CRM: Making knowledge for, from and about customers work. *Proceedings of the Eleventh Americas Conference on Information Systems, USA:* 167-178

16 Duncan, N.B. (1995). Capturing flexibility of information technology infrastructure: A study of resource characteristics and their measure: *Journal of Management Information Systems,* 12, 37-57

17 Wayne W. Eckerson, W. (2002). Data quality and the bottom line: Achieving business success through the commitment to high quality data

18 Everett, C (2002). The slings and arrows of CRM: *Computing*, 18,25-35

19 Foss Bryan and Stone Merlin (2001). *Successful Customer Relationship Marketing.* USA, IBM

20 Friedman, T. (2009). Overview for an enterprise wide data quality improvement project. *Gartner Group report series London.*

21 Hagemeyer, D. and Nelson, S.D (2003). CRM success lies in strategy and implementation, not software. *Gartner Group report series London.*

22 Gartner Reports (2009). Gartner Consultancy CRM, SCM, ERP 2006-2008 Reports, Gartner.

23 Gefen, D., & Ridings, C.M. (2002). Implementation team responsiveness and user evaluation of customer relationship management. *Journal of management information systems:* 47-69

24 Henderson, J.C., and Venkatraman, N. (1994). *Strategic alignment: A model for organizational transformation via information technology,* Cambridge: MIT

25 -Hyung-Su Kim & Young-Gul Kim (2009). A CRM performance measurement framework: Its development process and application. *Industrial Marketing Management:* 38, 477-489

26 Ja-Shen Chen, Russell K:H. Ching (2002). An empirical study of the impact of IT intensity and organizational absorptive capacity on customer relationship management performance. *Journal of Global Information Management*: 12,1-17

27 Kaila, I., &Goldman, M. (2006). Eight steps to implementing a successful CRM project. *Gartner Group report series Gartner London*

28 Markus, M.L (1983). Power, politics and MIS implementation. *Communications of the ACM:* Magazine, 26, 430-444

29 McKim, B and Hughes, A. (2000). How to measure CRM success. *Target marketing:* 138-149

30 Mendoza E. L., Marius A., Pérez M., Grimán C. A. (2007). Critical success factors for a customer relationship management strategy. *Information and Software Technology*: 49, 913–945.

31 Payne, A., Frow, P. (2005). A strategic framework for customer relationship management. *Journal of Marketing:* 69, 167-176

32 Prahalad C. K. ,Ramaswamy V. (2001). Co-opting Customer Competence. *Harvard Business Review on Customer Relationship Management*, 1-25, Harvard Business School Press.

33 Rainer Alt, Thomas Puschman (2004). Successful Practices in Customer Relationship Management. *Proceedings of the Thirty-Seventh Annual Hawaii International Conference on System Sciences*

34 Ranjit Bose (2002). Customer relationship management: key components for IF success. *Industrial Management & Data Systems:* 89-97

35 Reid A., O'Brien D. (2005). Creating a single view of the customer for CRM strategy. *Interactive Marketing*: 6, 357-365

36 Rodney Turner (2008). *Gower Handbook of Project Management,* Gower

37 Sarmad Alshawi, Farouk Missi, Zahir Irani (2010). Organizational, technical and data quality factors in CRM adaptation- SMEs perspective. *Industrial Marketing Management:* 1-8

38 Sauer, C., Southon, G., & Dampney, C.N.G. (1997). Fit, failure and the house of horrors: toward a configurational theory of IS project failure. *ICIS '97 Proceedings of the eighteenth international conference on Information systems:* 349-366

39 Shi, J., & Yip, L. (2007). Driving innovation and improving employee capability: The effect of customer knowledge sharing on CRM. *The effect of customer knowledge sharing on CRM:* The Business Review, 7, 107-112

40 Sin, L.Y.M., Tse, A.C.B., & Yim, F.H.K (2005). CRM conceptualization and scale development. *European Journal of Marketing:* 39, 1264-1290

41 Stefonuo, C.J.,Sarmaniotis, C., & Stafyla, A. (2003). CRM and customer-centric KM: An empirical research. *Business Process Management Journal:* 9, 617-634

42 Stephen F. King, Thomas F. Burgess (2005). Understanding success and failure in customer relationship management. *Industrial Marketing Management:* 37, 421-431

43 Swift, R.S. (2001). *Accelerating customer relationship using CRM and relationship technologies,* Prentice Hall

44 Te Ming Chang, Lin Li Liao and Wen Feng Hsiao (2005). An empirical study on the e-CRM performance influence model for service sectors in Taiwan. *The 2005 IEEE International Conference on:* 240-245

45 Winter, M., Smith, C., Morris, P., Cicmil, S. (2006). Directions for future research in project management: the main findings of a UK government-funded research network. *International Journal of Project Management:* 24, 638-649

46 Xu, M., & Walton, J. (2005). Gaining customer knowledge through analytical CRM. *Industrial Management & Data Systems:* 105, 955-971

47 Zablah, A.R., Bellenger, D.N, & Johnson, W.J. (2004). An evaluation of divergent perspectives on customer relationship management: Towards a common understanding of an emerging phenomenon. *Industrial Marketing Management:* 33, 475-489

48 Zhedan Pan, Hoyeon Ryu and Jongmoon Baik (2007). A case study: CRM adoption success factor analysis and six sigma DMAIC application. *Fifth International Conference on Software Engineering Research, Management and Applications:* 828-835

APPENDICES

APPENDIX A: SURVEY WITH CRM EXPERTS

1- Please give an importance level between 1and 5 to the following failure reasons of CRM implementation projects at telecommunication sector.

	Failure Reasons	Importance Level (5 means very important, 0 means not important)
1	Organizational and cultural change difficulties	
2	Lack of support from relevant departments	
3	Consultancy selection mistakes and difficulties	
4	Difficulties about finding appropriate project manager	
5	Lack of clear objectives	
6	Mistakes and difficulties about knowledge management	
7	Mistakes and difficulties about providing data quality	
8	Not caring about system improvement	
9	Regarding CRM as a pure technological solution and not focusing on human and processes factors	
10	Mistakes and difficulties about system integration	
11	Too much customization instead of changing company' s as is processes	

2- Please state any other reason that was not stated in the previous part that you think causes the failure of CRM projects at telecommunication sector. Also please give an importance level for the reason that you stated.

	Failure Reasons	Importance Level (5 means very important, 0 means not important)
1		
2		
3		
4		

APPENDIX B: STATISTICAL CALCULATIONS

Chi Square Statistical Analysis

Action coverage ratios of companies were calculated by averaging the results. Details are stated at Table 16.

Table 16: Action Coverage Ratios of Company X and Y

	COMPANY X	COMPANY Y
Vendor Selection		
Choice of vendor (Step 1)	HF3-1→ 10 points HF3-2→ 0 points PF3-1→ 10 points	HF3-1→ 10 points HF3-2→ 3 points PF3-1→ 10 points
Planning Part		
Define objectives (Step 2)	HF5-1→ 0 points HF2-1→ 5 points TF1-1→ 0 points HF5-3→ 3 points HF5-4→ 10 points	HF5-1→ 10 points HF2-1→ 10 points TF1-1→ 10 points HF5-3→ 10 points HF5-4→ 10 points
Define CRM project scope (Step 3)	HF4-1→ 3 points HF2-2→ 5 points HF5-5→ 3 points PF2-1→ 10 points PF1-1→ 0 points HF5-6→ 0 points	HF4-1→ 10 points HF2-2→ 10 points HF5-5→ 10 points PF2-1→ 10 points PF1-1→ 10 points HF5-6→ 10 points
Elaborate communication plans (Step 4)	HF2-3→ 0 points HF1-1→ 0 points	HF2-3→ 10 points HF1-1→ 10 points
Define the appropriate project organization (membership, roles and tasks) (Step 5)	HF4-2→ 5 points HF1-2→ 5 points TF2-1→ 10 points PF2-2→ 3 points PF2-3→ 5 points	HF4-2→ 10 points HF1-2→ 10 points TF2-1→ 10 points PF2-2→ 10 points PF2-3→ 5 points
Collecting end users' expectations (Step 6)	TF1-6→ 0 points	TF1-6→ 3 points
Define detailed objectives (Step 7)	HF5-7→ 10 points HF5-2→ 5 points	HF5-7→ 10 points HF5-2→ 5 points
Planning project (Step 8)	HF1-3→ 3 points TF2-2→ 0 points TF2-3→ 3 points TF1-2→ 0 points PF2-4→ 5 points TF1-3→ 0 points TF1-4→ 5 points	HF1-3→ 10 points TF2-2→ 10 points TF2-3→ 10 points TF1-2→ 5 points PF2-4→ 10 points TF1-3→ 10 points TF1-4→ 5 points
Ensure appropriate resources (Step 9)	HF1-4→ 10 points	HF1-4→ 5 points
Launching CRM project web site on the company intranet (Step 10)	TF1-5→ 0 points	TF1-5→ 5 points

Design Part		
Technical design (Step 11)	TF2-4→ 5 points	TF2-4→ 10 points
Interface design (Step 12)	TF1-7→ 10 points	TF1-7→ 10 points
Customization and upgrading of CRM software (Step 13)	TF3-1→ 0 points TF3-2→ 0 points	TF3-1→ 10 points TF3-2→ 10 points
Controlling the results of work packages (Step 14)	TF2-5→ 0 points	TF2-5→ 10 points
Setting of the software package (Step 15)		
Integration tests (Step 16)	TF2-6→ 5 points	TF2-6→ 10 points
Project piloting and controlling (Step 17)	TF2-7→ 5 points	TF2-7→ 10 points
Communication with top management and local managers (Step 19)	HF2-4→ 5 points	HF2-4→ 10 points
Communication within agencies by the help of regular meetings, hotline, flashes and newsletters (Step 20)	HF1-5→ 10 points	HF1-5→ 10 points
Business Process Reengineering(BPR) deployment (Step 21)	TF1-8→ 0 points TF1-9→ 0 points HF1-6→ 0 points	TF1-8→ 3 points TF1-9→ 3 points HF1-6→10 points
Rolling Out Phase		
Usage evaluation (Step 22)	PF3-2→ 5 points	PF3-2→ 10 points
Evaluation of end users' training (Step 23)	TF1-10→ 10 points	TF1-10→ 3 points
AVERAGE	= (183/470) * 100	= (405/470) * 100

Numbers that used at Chi Square statistical analysis are stated at Table 17.

Table 17: Chi Square Data

Company	**Method coverage percentage**	**Project Success Percentage**
Company X	38, 9	32
Company Y	86, 2	83

By the help of Chi Square statistical analysis, the results can be analyzed to find the probability of positive impact of method coverage percentage on the project success percentage. The Chi Square analysis can be used for following cases:

- To analyze the coherence between data sets
- To analyze the independency between data sets
- To analyze the homogeneity

For our case, the aim is to show the independency between our data set.

The Chi Square analysis is as follows:

Ha: Method coverage percentage does not have an effect on the project success percentage

Hb: Method coverage percentage has an effect on the project success percentage

Because we have 2x2 data set, we will use Fisher's exact χ^2**H**formula

Formula: $((a.d - b.c)^2 N) / \sqrt{(n1.n2.n3.n4)}$

	1	**2**	
A	a	b	n1
B	c	d	n2
	n3	n4	N

	Method coverage percentage	**Project success percentage**	
Company X	0,389	0,32	0,709
Company Y	0,862	0,83	1,692
	1,251	1,15	2,401

According to this data formula and data,

χ^2h: 0, 0040424

Decision condition is:

***If* χ^2H > χ^2T, Ha rejected**

***If* χ^2H < χ^2T, Ha accepted**

$\chi^2\alpha$, (r-1)*(i-1) r: number of rows and i: number of columns

If we take confidence level α as 0, 05 which means the result will be %95 confident

χ^2T : $\chi^2$0,05, 1*1 : 0,00393 which is took by Chi Square table.

χ^2H > χ^2T so Ha is rejected and Hb is accepted with 95% confidence level

Comment: With 95% confidence level, method coverage level affects the project success percentage positively.

Regression Analysis

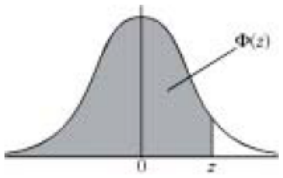
By the help of regression analysis the success ratio increase with one unit method coverage percentage found as 1, 09 which means each unit increase at the method coverage, increase project success percentage 1, 09 unit. If a company cover 100% of the road map steps, by the help of regression analysis, expected project success percentage is founded about 98,5 which is very close to 100%. Also if we want to see the probability of having a project success above a 70% that can be interpreted as project is not failed and completed successfully, by the help of normal distribution function, it can be found that, this probability is very close to 1. By the help of normal distribution function, it can be find that, if the expected result or the mean value of the distribution is 98,5 and the expected result is above the 70, the area under the curve that is X value is smaller than 70 is a very small number which is closer to zero, so probability of having a result that is greater than 70 is very close to 1, so 100% of method coverage means a success probability which is very close to 1 which means exact probability.

THE NORMAL DISTRIBUTION FUNCTION

If Z has a normal distribution with mean 0 and variance 1 then, for each value of z, the table gives the value of $\Phi(z)$, where

$$\Phi(z) = \mathrm{P}(Z \le z).$$

For negative values of z use $\Phi(-z) = 1 - \Phi(z)$.



z	0	1	2	3	4	5	6	7	8	9	1	2	3	4	5	6	7	8	9
											ADD								
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359	4	8	12	16	20	24	28	32	36
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753	4	8	12	16	20	24	28	32	36
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141	4	8	12	15	19	23	27	31	35
0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517	4	7	11	15	19	22	26	30	34
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879	4	7	11	14	18	22	25	29	32
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224	3	7	10	14	17	20	24	27	31
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549	3	7	10	13	16	19	23	26	29
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852	3	6	9	12	15	18	21	24	27
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133	3	5	8	11	14	16	19	22	25
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389	3	5	8	10	13	15	18	20	23
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621	2	5	7	9	12	14	16	19	21
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830	2	4	6	8	10	12	14	16	18
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015	2	4	6	7	9	11	13	15	17
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177	2	3	5	6	8	10	11	13	14
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319	1	3	4	6	7	8	10	11	13
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441	1	2	4	5	6	7	8	10	11
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545	1	2	3	4	5	6	7	8	9
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633	1	2	3	4	4	5	6	7	8
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706	1	1	2	3	4	4	5	6	6
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767	1	1	2	2	3	4	4	5	5
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817	0	1	1	2	2	3	3	4	4
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857	0	1	1	2	2	2	3	3	4
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890	0	1	1	1	2	2	2	3	3
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916	0	1	1	1	1	2	2	2	2
2.4	0.9918	0.9920	0.9922	0.9925	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936	0	0	1	1	1	1	1	2	2
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952	0	0	0	1	1	1	1	1	1
2.6	0.9953	0.9955	0.9956	0.9957	0.9959	0.9960	0.9961	0.9962	0.9963	0.9964	0	0	0	0	1	1	1	1	1
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974	0	0	0	0	0	1	1	1	1
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981	0	0	0	0	0	0	0	1	1
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986	0	0	0	0	0	0	0	0	0

Figure 12: The Normal Distribution Function

APPENDIX C: REFERENCE COVERAGE

No	Author	Year	Regarding CRM as a pure technological solution and not focusing on human and processes factors	Organizational and cultural change difficulties	Lack of clear objectives	Difficulties about finding appropriate project manager	Mistakes and difficulties about system integration	Lack of support from relevant departments	Too much customization instead of changing company' s as is processes	Mistakes and difficulties about providing data quality	Mistakes and difficulties about knowledge management	Not caring about system improvement	Consultancy selection mistakes and difficulties
1	Adel Beldi, Walid Cheffi and Prasanta K.Dey	2009	1			1	1	1					
2	Ahlemann, F.	2009				1							
3	Aurora Garrido-Moreno, Antonio Padilla-Melendez	2011	1	1									
4	Baltzan P., Philips A., Haag S., McGraw-Hill. Irwin,	2006											
5	Beijerse, R.P.	1999											
6	Bob Thompson	2004					1						
7	Brown, S.A.,	2000	1										
8	Bull, C.	2003				1							
9	Bygstad, B.	2003		1		1							
10	Carlsson, C. and Walden, P.	2000	1										
11	Chalmeta R.	2006										1	
12	Chen, I.J., Popovich, K.	2003	1				1						
13	Corner, I., Hinton, M.	2002				1							
14	CSO Insights	2006				1							
15	Dous, M., Kolbe, L., Salomann, H.&Brenner, W.	2005								1	1		
16	Duncan, N.B.	1995											
17	Eckerson, W.	2002								1			

18	Everett, C	2002	1										
19	Foss & Stone	2001		1	1								
20	Friedman, T.	2009								1			
21	Gartner	2009								1	1		
22	Gartner Group	2003	1	1									
23	Gefen, D.,& Ridings, C.M.	2002	1									1	
24	Henderson, J.C., and Venkatraman, N.	1994											
25	-Hyung-Su Kim & Young-Gul Kim	2009			1								
26	Ja-Shen Chen, Russell K:H. Ching	2002	1					1					
27	Kaila, I., &Goldman, M.	2006								1			
28	Markus, M.L	1983	1					1					
29	McKim, B and Hughes, A.	2000											
30	Mendoza E. L., Marius A., Pérez M., Grimán C. A.	2007	1	1		1		1					
31	Payne, A., Frow, P.	2005	1	1		1							
32	Prahalad C. K. ,Ramaswamy V.	2001											
33	Rainer Alt, Thomas Puschman	2004	1					1		1	1		
34	Ranjit Bose	2002	1				1	1		1			1
35	Reid A., O'Brien D.	2005											
36	Rodney Turner	2008											
37	Sarmad Alshawi, Farouk Missi, Zahir Irani	2010								1			1
38	Sauer, C., Southon, G., & Dampney, C.N.G.	1997	1										
39	Shi, J., & Yip, L.	2007									1		
40	Sin, L.Y.M., Tse, A.C.B., & Yim, F.H.K	2005										1	
41	Stefonuo, C.J.,Sarmaniotis, C., & Stafyla, A.	2003									1		

42	Stephen F. King, Thomas F. Burgess	2005					1					1		
43	Swift, R.S.	2001	1	1										
44	Te Ming Chang, Lin Li Liao and Wen Feng Hsiao	2005									1			
45	Winter, M., Smith, C., Morris, P., Cicmil, S.	2006	1	1										
46	Xu, M., & Walton, J.	2005	1	1										
47	Zablah, A.R., Bellenger, D.N, & Johnson, W.J.	2004									1			
48	Zhedan Pan, Hoyeon Ryu and Jongmoon Baik	2007							1					
			18	9	2	8	5	6	1	8	7	4	2	

APPENDIX D: DETAILS OF EXPERTS' ANSWERS

Details of experts' answers are stated at Table 18.

Table 18: Details of Experts' Answers

Failure Reasons	5	4	3	2	1	Total
Regarding CRM as a pure technological solution and not focusing on human and processes factors	16	11	8	6	4	**∑=164**
Organizational and cultural change difficulties	8	12	9	5	3	**∑=128**
Lack of clear objectives	6	8	13	3	5	**∑=112**
Difficulties about finding appropriate project manager	6	7	7	3	3	**∑=88**
Mistakes and difficulties about system integration	3	3	4	6	4	**∑=55**
Lack of support from relevant departments	2		3	7	5	**∑=38**
Too much customization instead of changing company' s as is processes	2	2	1	4	4	**∑=33**
Mistakes and difficulties about providing data quality	2	2		3	3	**∑=27**
Mistakes and difficulties about knowledge management				3	5	**∑=11**
Not caring about system improvement				3	4	**∑=10**
Consultancy selection mistakes and difficulties				2	5	**∑=9**
	∑=45	∑=45	∑=45	∑=45	∑=45	

APPENDIX E: GENERAL RISKY STEPS

Actions of general risky steps are stated at Table 19.

Table 19: Actions of General Risky Steps

Road Map Step	Critical actions for general projects
Vendor Selection	
Choice of vendor	**HF3-A1**→Selecting an appropriate vendor **HF3-A2**→Work with a consultancy company
Planning Part	
Define objectives	**HF5-A1**→Taking consultancy about CRM concept **HF2-A1**→Deciding on the authorities of the project
Define CRM project scope	**HF4-A1**→Selecting an appropriate project manager and give necessary authorization **HF2-A2**→Scope approval by all authorities of the project
Elaborate communication plans	**HF2-A3**→Creating communication plans with all relevant departments
Define the appropriate project organization (membership, roles and tasks)	**HF4-A2**→Selecting an appropriate project manager or a management team **HF1-A2**→Stating project sponsors **TF2-A1**→Selecting appropriate technical architect
Collecting end users' expectations	**TF1-A6**→Collecting end users' expectations and taking necessary actions according to them to increase users' convenience
Define detailed objectives	**HF5-A7**→Creating all details of requirements **HF5-A2**→Taking help from a consultancy company to create reasonable and clear requirements
Planning project	**HF1-A3**→Creating project team as soon as possible **TF2-A2**→Creating a phased project plan as spiral process model **TF2-A3**→Devoting enough time for integration tests and stressing the importance of these tests **TF1-A2**→Including new processes and teams or changes about processes and teams at project plan
Ensure appropriate resources	**HF1-A4**→Creating a competent IT team that is being planned to be responsible of CRM system as soon as possible

Design Part	
Technical design	**TF2-A4**→Caring about integration structure, technical details and data consistency
Interface design	**TF1-A7**→Creating functional and simple interface design to increase the usability of the system
Customization and upgrading of CRM software	**TF3-A1**→Decreasing customization as much as possible **TF3-A2**→Changing legacy processes according to the purchased solution
Controlling the results of work packages	**TF2-A5**→Using spiral process model and controlling every modules before start the following cycle
Integration tests	**TF2-A6**→Caring not only unit tests but also integration tests and also delegating integration tests' responsibility to a party
Project piloting and controlling	**TF2-A7**→Piloting the system and controlling the integration points in detail
Communication with top management and local managers	**HF2-A4**→Informing relevant top management and taking their approvals about the progress of the project as much as possible
Communication within agencies by the help of regular meetings, hotline, flashes and newsletters	**HF1-A5**→Informing relevant parties about progress of the project as much as possible
Business Process Reengineering(BPR) deployment	**TF1-A8**→Performing and managing necessary process changes **TF1-A9**→Performing and managing necessary team creations
Rolling Out Phase	
Usage evaluation	**PF3-A2**→Observing system usage and taking necessary actions if necessary
Evaluation of end users' training	**TF1-A10**→Caring about end users' training and evaluating training processes

ENSTİTÜ

Fen Bilimleri Enstitüsü	
Sosyal Bilimler Enstitüsü	
Uygulamalı Matematik Enstitüsü	
Enformatik Enstitüsü	X
Deniz Bilimleri Enstitüsü	

YAZARIN

Soyadı: ÇAĞLAYAN

Adı: ALİ YÜKSEL

Bölümü: BİLİŞİM SİSTEMLERİ

TEZİN ADI (İngilizce) : ANALYSIS OF HIGH FAILURE RATES OF CRM PROJECTS IN TELECOMMUNICATION SECTOR AND PROPOSAL FOR A ROAD MAP ELABORATION

TEZİN TÜRÜ: Yüksek Lisans [X] Doktora [ ]

1. Tezimin tamamı dünya çapında erişime açılsın ve kaynak gösterilmek şartıyla tezimin bir kısmı veya tamamının fotokopisi alınsın. [ ]

2. Tezimin tamamı yalnızca Orta Doğu Teknik Üniversitesi kullanıcılarının erişimine açılsın. (Bu seçenekle tezinizin fotokopisi ya da elektronik kopyası Kütüphane aracılığı ile ODTÜ dışına dağıtılmayacaktır.) [X]

3. Tezim bir (1) yıl süreyle erişime kapalı olsun. (Bu seçenekle tezinizin fotokopisi ya da elektronik kopyası Kütüphane aracılığı ile ODTÜ dışına dağıtılmayacaktır.) [ ]

Yazarın imzası Tarih