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YEDİTEPE UNIVERSITY
GRADUATE INSTITUTE OF SOCIAL SCIENCES

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by

Arif Arda KARACELEBI

Submitted to the Graduate Institute of Social Sciences
In partial fulfillment of the requirements for the degree of
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LIST OF ABBREVIATIONS

2.5G:	Enhanced 2G networks
2G:	Second-generation mobile network or service
3G:	Third-generation mobile network or service
ACD:	Automated Call Distribution
AMPS:	Advanced Mobile Phone System.
ARPU:	Average Revenue Per User.
ASP:	Application Service Provider
ATM:	Asynchronous Transfer Mode.
B2B:	Business to Business.
B2C:	Business to Consumer.
CAGR:	Compound Annual Growth Rate.
CDMA:	Code Division Multiple Access.
CDMA2000:	A third-generation digital cellular standard
cdmaOne:	2.5G mobile cellular standard
CPP:	Calling party pays.
CRM:	Customer Relationship Management
CTI:	Computer Telephony Integration
DCS-1800:	GSM networks using the 1'800 Mhz frequency.
DECT:	Digital Enhanced Cordless Telecommunications.
DSL:	Digital subscriber line.
EDGE:	Enhanced Data rates for GSM Evolution.
ERP:	Enterprise resource Planning
FDD:	Frequency Division Duplex.
FDMA:	Frequency Division Multiple Access.
FFSK:	Fast Frequency Shift Key Modulation
FSK:	Frequency Shift Key
Gbit/s:	Gigabit per second.
GDP:	Gross domestic product.
GMPCS:	Global Mobile Personal Communications by Satellite.
GNP:	Gross national product.
GPRS:	General Packet Radio Service.
GPS:	Global Positioning System
GSM:	Global System for Mobile communications.
GSMK:	Gaussian Minimum Shift Key Modulation
LAN:	Local Area Network.
HSCSD:	High Speed Circuit Switched Data.
HTML:	Hypertext Markup Language.
HTTP:	Hypertext Transfer Protocol.
Hz:	Hertz.
IMT-2000:	International Mobile Telecommunications. Third-generation of mobile cellular standards
ISP:	Internet Service Provider
IP telephony:	Internet Protocol Telephony.
IP:	Internet Protocol.
ISDN:	Integrated Services Digital Network..
ISP:	Internet Service Provider.

ITU: International Telecommunication Union.
IVR: Interactive Voice Response
LAN: Local Area Network
LBS: Location-based services
MASP: Mobile application service provider
Mb: Mega bit.
Mbit/s: Megabit per second. See also bit/s.
MCS: Mobile Communication System
M-mail: Mobile-mail.
MVNO: Mobile Virtual Network Operator
MP3: MPEG-1 Audio Layer-3
MMS: Multimedia Message Service
NMT: Nordic Mobile Telephone system.
NO: Network operator.
1:1 Marketing: One to One Marketing
PCS: Personal Communication Services.
PDA: Personal Digital Assistant.
PKI: Public key infrastructure
PPP: Purchasing power parity.
PSTN: Public Switched Telephone Network.
PTO: Public telecommunication operator.
QoS: Quality of Service
SSL: Secure Sockets Layer
SLA: Service Level Agreements
SIM: Subscriber identity module
SMS: Short Message Service.
SMTP: Simple Mail Transfer Protocol.
TACS: Total Access Communications System.
TCP: Transmission Control Protocol.
TDD: Time Division Duplex.
TDMA IS-136: A digital cellular standard
TDMA: Time Division Multiple Access.
TCP/IP: Transmission Control Protocol/Internet Protocol
UIM: User Identity Module.
UMTS: Universal Mobile Telecommunications System.
URL: Uniform Resource Locator
VoIP: Voice over IP.
VXML: Voice eXtensible Markup Language.
WAP: Wireless Application Protocol.
W-CDMA: Wideband Code Division Multiple Access.
Wi-Fi: Wireless Fidelity
WLAN: Wireless LAN
WWW: World Wide Web
xDSL: General representation for various types of digital subscriber line technology
xHTML: Extensible Hypertext Markup Language.
XML: Extensible Mark-up Language.

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who has always supported me and my work.

January 2005

ABSTRACT

Mobile communication is continuously increasing its penetration on all over the world. By the year end 2003, total number of mobile subscribers reached over 1.3 billion in the world. As the market has shaped deeply while transferring from First Generation Mobile Services to Second Generation Mobile Services; Third Generation Mobile Services become a driver to shape the market in next seven to ten years till the introducing of Forth Generation Mobile Services. High capital cost of investment requirements, effects of converging technologies and killer applications may shake the market and so the marketing function. Expected effects will be changing the core of marketing focus to loyalty and introducing new business models that handle customized and diversified wide range of offerings with partner companies.

The research is planned to understand the current trends for both CRM and mobile communications and the effects of new services to the CRM processes in terms of five major drivers which are identified as strategy, process, organization technology and aesthetics. Research data from various industry specific research corporations and academic analysis are supported with the original survey of the research which was delivered to over four thousand industry experts on world wide and had fifty four responses from Asia, Europe and North America.

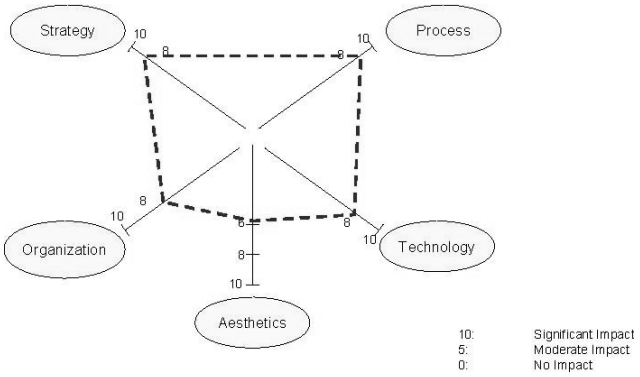


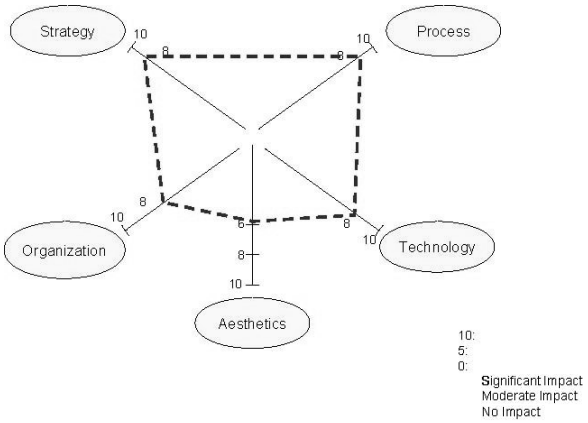
Figure Abstract - The Evaluation of effect accross five CRM drivers

As a brief summary the effect of 3G for the CRM functionalities will be moderate to high in terms of strategy, technology, organization, process and aesthetics. In the above figure a generic estimation is presented as a visual representation of the degree of impact.

OZET

Mobil iletişim dünyadaki pazar payını sürekli olarak artırıyor. 2003 sene sonu itibari ile dünya üzerinde 1,3 milyardan fazla cep telefonu ve mobil iletişim kullanıcısı bulunmakta. Birincil Nesil Mobil İletişim Hizmetlerinden İkincil Nesil Mobil İletişim Hizmetlerine geçildiği sırada karşılaşılan mobil iletişim pazarındaki köklü değişiklikler göz önüne alıindığında, Üçüncül Nesil Mobil İletişim Hizmetlerinin önümüzdeki yedi ile on yıl içerisinde Dördüncül Nesil Mobil İletişim Hizmetlerinin kullanıma geçilmesine kadar olan süreç zarfında, pazarı şekilendiren unsur olması beklenmektedir. Yüksek yatırım maliyetleri, teknoloji platformlarının pek çok hizmeti aynıi anda desteklemesi ve de kullanıcılar tarafından vazgeçilemeyecek yeni servislerin pazara tanıtımı, mobil iletişim pazarını ve de pazarlama fonksiyonlarını derinden etkileyebilir. Bu çerçevede pazarda gerçekleşmesi gereken en belirgin değişiklikler pazarlamanıin odak noktasının müşteri sadakatine yoğunlasması ve iş ortakları ile bütünleşik olarak operatörler tarafından sunulması beklenen müşteriye ozel, cok zengin ürün ve hizmet portföylerini destekleyecek yeni iş modellerinin oluşmasıdır.

Araştırma, CRM, mobil haberleşme ve pazara girmesi beklenen yeni hizmetlerin ve uygulamaların, CRM süreçlerine strateji, süreç, teknoloji, organizasyon ve estetik olarak sınıflandırılabilecek beş temel etken açısından etkilerini belirlemek ve açıklamak amacı ile planlanmıştır. Çeşitli araştırma kurumlarının ve akademik enstitülerden elde edilen araştırma verileri, tez çerçevesinde hazırlanan ve dünya çapında dört bin endüstri uzmanına gönderilerek Kuzey Amerika, Avrupa ve Asya'dan elli dört uzman tarafından doldurulan anket ile desteklenmiştir.



şekil özet: üçüncül jenerasyon **iletisim teknolojilerinin CRM'e etkisi**

Gerçekleştirilen çalışmanın sonucuna gore 5 ana bileşenli değerlendirme şablonu çerçevesinde üçüncül jenerasyon iletişim teknolojilerinin müşteri ilişkileri yonetimine olan etkisi strateji, organizasyon, teknoloji, estetik ve süreç açısından orta düzey ile yüksek düzey seviyesi arasında gercekleşecektir. Yukarıdaki şekilde bu etkinin beklentisi genel bir ölçüm tablosu halinde sunulmuştur.

1 INTRODUCTION

1.1 Introduction

It is impossible to step in the same river twice says Heraclitus. As river passes continuously it will not be the same river any more. In to days competitive and hyper innovative markets this river represents the time. As time passes by, technology, organizations, cultures, processes and needs also change. Markets continuously push their own limits to find some opportunities to grow. While pushing these limits it finds new eras and then compete in that area to have the bigger share as much as possible. And as market becomes competitive then efficiency becomes important. Companies try to adopt their operations more efficiently managed.

By 2004 global economies and its players are pushing telecommunication and biotechnology to find new areas. In terms of telecommunication one new area is defined to be the wideband mobile communications which are also known as 3G mobile communications. As technology vendors will push the technology, as operators want to be more competitive and as customers will ask for it as they understand the promising world of 3rd Generation Communications, even though it may result in unprofitable investments, cash flow problems, bankruptcies which will lead to acquisitions and merges, market players are going to implement this technology enhancement to stay in the game and then develop their strategy to be competitive.

As it is known that customer relationship management is an effective strategy to stay competitive and retain customers, it is obvious that these technologies must have some impact on current CRM processes, strategies, organizations and technologies.

1.2 Description of Research

This research is designed to forecast the effects of new wireless mobile communication technologies for the Telecommunication Industry. The scope of the thesis is limited for communication service providers and their CRM processes.

To clarify the effects of the technology, research is designed to clarify the technology outputs and technological environment changes such as the new capabilities, telecommunication industry structure and competitiveness, definition of the CRM and its

stakeholders for telecom operators, a fully defined CRM view and scoring structure and evaluation of the each technological effect in terms of defined scoring drivers.

Since the technology is new and has not been introduced to large customer base and or has not started to change the CRM processes fundamentally; the research focused on utilizing literature review, expert level survey, referring to industry forecasts of the research institutions, and criteria based analysis of each CRM process compound.

To do that a combination of various CRM definitions including the CRM drivers have been enhanced by the literature review and then used as driver based effect analysis template.

1.3 Title

The title of thesis study is "Effects Of 3G Communication Technologies On CRM In Telecommunications Industry ".

1.3.1 Purpose

This thesis is prepared to understand the effect of a newly introduced technology, third generation wireless technology, to the telecommunication service providers' CRM processes. The research also focuses on defining a framework to evaluate new technology and or process effects for CRM functions of the organizations. The challenge of the thesis to foresee the effects before the technology is fully implemented.

The main purpose of the thesis is to give an opinion for the telecom companies to forecast the challenges that they may phase and the required restructring needs in their business models in order to stay competitive in the market at least with customer facing processes.

1.3.2 Scope of the study

In this study, research has not limited the research for any geographic region. The industry is limited for Telecommunications Industry and the processes are limited with the customer facing and or effecting processes which are basically marketing, customer support, sales and customer service processes. The analysis is done only for the effect of 3G technology implementations for the existing 2G, PSTN, Cable Telecom operators. For so called third generation 3G technology variations the ITU definitions are utilized.

1.3.3 Structure of thesis

In Chapter 1, the brief introduction of the thesis is presented. Description of the research, purpose and scope is defined. Methodology is briefly introduced as well as research methods used for the thesis are summarized.

In Chapter 2, research design and research methodology is described in detail. The type of investigation, how we developed the CRM framework, the steps taken to asses the effects of 3G on telecommunications and CRM, data collection method and the data analysis techniques as well as sampling methodology is introduced.

In Chapter 3, we have summarized the our literature review which assisted us to develop and asses our crm framework analysis. We have performed our literature review in three section which are review of CRM concepts, review of proposed business models and wireless telecom market and CRM market research results.

In Chapter 4, we introduced the conceptual models which have been developed during our research in order to asses the effects of the 3G in CRM applications for telecommunication industry. To do that we have summarized the drivers of our business model framework and CRM five driver framework.

Chapter 5 is the core of the analysis. In this chapter we have listed our findings in detail as mapping them on the CRM five driver frame work and then examine each driver and its subcomponent in terms of our related findings. We have also used SWOT and five forces analysis in order to identify the market level influences and drivers which may affect our driver framework.

In Chapter 6, we have summarized our expectations and recommendations for the future work which may precede to pursue our findings and to develop and tune our conclusions with further academic research results.

In Chapter 7 we simply conclude our findings as a brief summary. We also visualize our findings in a small graph as we summarize the level of effect for five components.

In order to leverage our understanding we also introduced History of communications and telecommunication basics as appendixes as well as the questionnaire which is used for our survey.

1.3.4 Definitions

For detailed definitions please refer to the glossary chapter of the appendix section.

1.4 Methodology

1.4.1 SWOT Analysis

SWOT analysis is used strengthen the five forces model to clearly define the industry structure and position and model a telecom operators with its all business drivers to sustain competitiveness in the market.

1.4.2 Five Forces Analysis

Michael Porter's Five Forces analysis is used to define the industry structure for telecommunication industry. Using this methodology researched had focused on the business environment and drivers that affect the business models.

1.4.3 Maslow's Hierarchy of Needs Analysis

Our research focuses on CRM and there fore the customer needs. Therefore we analyzed the capabilities and the benefits of 3G technologies and mapped them in terms of Maslow's needs of hierarchy to understand the priorities that drive the customers. We used this information to map and compare with the operators business challenges and to finally evaluate the CRM framework collectively in terms of the business and customers point of view.

1.4.4 CRM Framework Analysis

Our research enhanced the CRM drivers in to more detailed and comprehensive picture. The research has examined the various approaches to the CRM definitions and methodologies and come up with a combined picture which includes the organization technology and process collectively with a full range of scope which interferes with all customer facing processes. The conclusion is used as a framework to score each driver against the 3G technology capabilities and industry effects in terms of challenges. Framework includes the aesthetics, strategy, organization, technology and process perspectives for the CRM business functions. This framework is also a product of this research and it is used as an internal methodology to finalize our findings. Our analysis is

mainly focuses on this framework in order to define and classify the effects of the new technology for each CRM component for telecommunications industry. For the effect on each driver and its components are forecasted using the industry analysts researches and thoughts, our thesis questionnaire results, industry experts' comments and other academic research paper results.

1.4.5 Research methods

The research methods explained below are used for data collection, and analysis in this study. Please refer to references section of this thesis for the complete list of sources.

1.4.5.1 Literature Review

We have used various sources of literature review to include the detailed information about in every aspects of CRM in 3G environment, in Telecommunications industry.

1.4.5.1.1 Industry Analysts Reports & Books

The research has utilized the industry analyst reports such as IDC, Gartner Group, Forrester Research and other research institutions. Research also utilized the assumptions and approaches of the industry futurists and or experts such as George Gilder. Our research also included the detailed review of the books of Marketing and Telecommunications in Toronto Reference Library and we have reviewed and included many marketing and telecom technology publications for the clear definition of our definition environment.

1.4.5.1.2 Industry Association Publications

Research has included the detailed review of industry publications by the major industry associations such as ITU. We have especially included the approaches of the industry associations, which basically introduce the industry wide standardization that draws the big picture for the universe of the applications.

1.4.5.1.3 Research Paper Review

Research has included a detailed search on Academic research papers mainly focused on 3G and its effect on CRM. We have included the forecasts and technology reviews as much as loyalty and marketing aspects of the communications. Moreover during our study, we have also experienced that the material which we have referenced here as the industry

association publications have been used repeatedly in many academic papers as a reliable source for the details of the technological infrastructure and their future forecasts.

1.4.5.1.4 Consulting & Applications Vendor White Papers Review

Research has also includes the perspective of the subject mater experts in application and technology vendors as well as the senior consultants in major consulting companies such as Capgemini, Arthur Andersen, McKinsey, Accenture and Bearingpoint using their publicized published documents and or comments from their subject matter experts. We have also included industry expert approaches and the vendor white papers from Clarify/Amdocs, Cisco, AT&T Research Labs, Lucent, Nortel and etc.

1.4.5.1.5 Internet

We have included internet searches using the most comprehensive search tools such as Google and Copernic. We have also used industry web pages and their library links to enhance our findings related with the findings. Moreover we have been subscribed to over hundred mail forum group via email group hosts such as yahoogroups. We have picked every one of them according to their commitment to the 3G and CRM processes and the level of information flow between their members. Using this email groups we increased our knowledge for information sources.

1.4.5.2 Industry Expert Interviews

We have met some industry experts from leading technology vendors and consulting practices and we have shared and discussed the finding and their thoughts on our approaches and validated/enhanced our results with them.

1.4.5.3 Questionnaire

We have created a comprehensive questionnaire which has questions about the drivers of the framework. After refining the questionnaire with the advises of our research instructors we have hosted it on a web site and send invitation four thousand of industry experts and stakeholders of these processes. We have received over fifty responses from all over the world including Asia, North America and Europe.

Then we have categorized the results of the questionnaire using Pareto charts and other histograms and used the results to strengthen our findings at the result of our research.

1.4.6 Software

Our research has been done using various applications such as JMP, SAS Software: A Statistical Research Software which is basically designed and commercialized for Research Institutions by Datamining and statistical analysis Industry leader SAS Software. ASP /HTML: Web based development languages which is used to develop the web page for questionnaire and the responses Microsoft FrontPage: A web publisher program Microsoft Excel: A functional spread sheet calculations program Microsoft Word: An advanced word processor which is used to create the final version of the document Microsoft PowerPoint: Is used to prepare shapes and diagrams for the documentation. Adobe Acrobat Writer and PDF995 software are used to create PDF documents and or open PDF documents and utilize the graphics from these documents.

Adobe Photoshop: A picture editing program, which is used to optimize the size and color of the pictures to be able to be used efficiently in the final document Scanner tool is used to be able to use graphics from the printed industry publications.

2 RESEARCH & DESIGN METHODOLOGY

2.1 Type of Investigation

In order to be able to analyze the effects of the 3G technologies on CRM processes on Telecommunications industry. We have planned to use a component based analysis and define the effect for the each component and or functionality of the CRM universe.

Throughout our initial analysis and literature review we have experienced that the CRM definitions and or component definitions are indifferent from each other and dependent on the point of view of the writer's academic view or the telecom operators, consulting companies' and/or application vendors'. Therefore we have decided first to define our own framework which will represent a comprehensive understanding for CRM for Telecommunications Industry. And then evaluate the new business models of the 3G technologies against this framework.

2.1.1 Developing the CRM Framework

In order to develop our own framework we have decided to combine various definitions of CRM frameworks as examining different versions. We have started with the definition of

the CRM and then listed the various components, which have been used in individual definitions. We also combined the overlapping definition under one name. During this approach we also included the predefined business models and processes for 3G technologies so that our universe for the framework will be able to include the new applications, new processes and telecom specific processes within its skeleton work. We have examined the each component and the effect on this section of the thesis and then concluded the summary framework at the findings chapter. We have also summarized the majority of the 3G effects in terms of CRM processes while we are basically defining the CRM components of the CRM business universe.

In many applications we have experienced that the CRM building blocks are basically defined as Strategy, Organization and Technology and or Process, Organization and Technology. In our approach we have introduced one more new building block, which is called Aesthetics. During our research we have figured out that technology, organization, strategy and process building blocks will require a consistent aesthetic perspective due to the nature of the business as it is focused on the Customer's satisfaction and loyalty. And that aesthetic perspective may get more importance as the band width will poses new mediums to stimulate new senses such as eyes/sight.

2.1.2 Assessing the Framework for the effect of 3G technologies

As we get the framework compounds, we have figured out that one of the compounds of the framework has become the strategy of CRM, which will be interfering with the market strategy. Therefore in order to be able to do complete analyses for the effect of 3G on CRM business functions we prepared a market analysis for telecommunication industry especially with the 3G perspective.

2.1.2.1 Market Analysis

For the market analysis we have defined a global level macro picture of the industry and we have defined the forecasts, which are done for the industry. For these analyses we have used the industry analysts' expectations, academic paper reviews, industry association forecasts and white paper forecasts by the vendor companies. For market analysis first the industry analysis for communication industry is done briefly then the approach was focused to mobile communications. We have also examined the CRM market in order to be able to

have the complete picture. Then we have prepared a SWOT analysis and five forces analysis in order to classify the expected changes and effects in the market for the 3G technologies.

2.1.2.2 Frame work driver effects classifications

While developing this analysis we have also decided to use Maslow's hierarchy level in order to match the 3G offerings with customer base needs which will help us to understand the customer's service requirement priorities. There fore we have included the Maslow's hierarchy in our framework. Then using the information that we have developed by chapter 3, 4 and 5 we have started to asses each driver of our framework. During these assessments we have leverage our findings using our questionnaire results and the further literature reviews. Basically we have classified the various findings in to our framework to be able to create a complete picture. For our findings and forecasts we have defined the base of the finding in chapters 3, 4 and 5. Such as security leverage of the location based services for parental needs of the buying decision makers. For questionnaire we have tried to avoid our substances to have a certain regional profile but an expertise at least as a potential user, a technology driven personality and or subject matter expert.

2.2 Data Collection Method

Research data from various industry specific research corporations and academic analysis are supported with the original survey of the research which was delivered to over four thousand industry experts on world wide and had fifty four responses from Asia, Europe and North America. The questionnaire is published on web site. It is designed to be user friendly those users basically navigate to the web site and chooses the answers from multiple choices and then they send the form simply clicking on send button. There fore we have received the file as a text based email and then imported it to a excel spreadsheet. Then we have transferred the data in to one large table where all the answers from other respondents are consolidated. Then we utilized Pareto analysis and frequency histograms to compare the answers of the respondents. Moreover we have also used academic papers and industry analysts' reports to provide a clear base for our findings.

2.3 Sampling & Data Analysis

As we have send our questionnaire invitation to over 4000 industry related substances via the 3G and CRM related message boards/ forums and also consultants and subject matter experts through out the world. We have been end up with a respondent community mainly focused on IT and Telecom Operators as well as financial services.

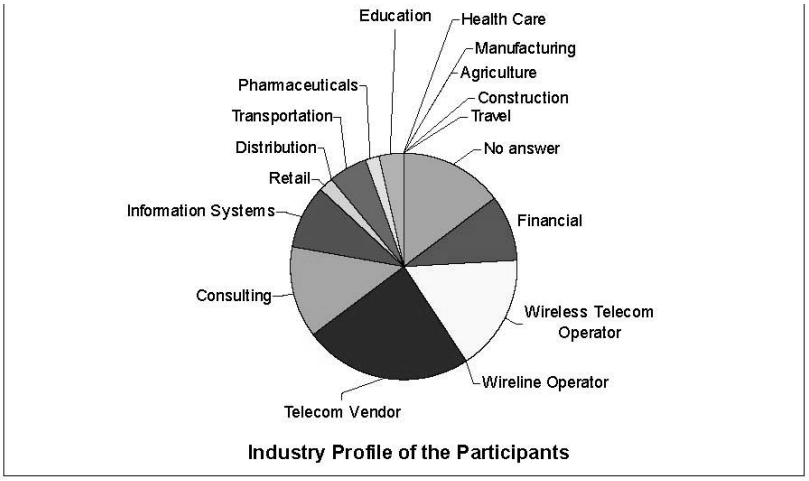


Figure 2-1 Research Questionnaire: Industry Profile of the Questionnaire Participants

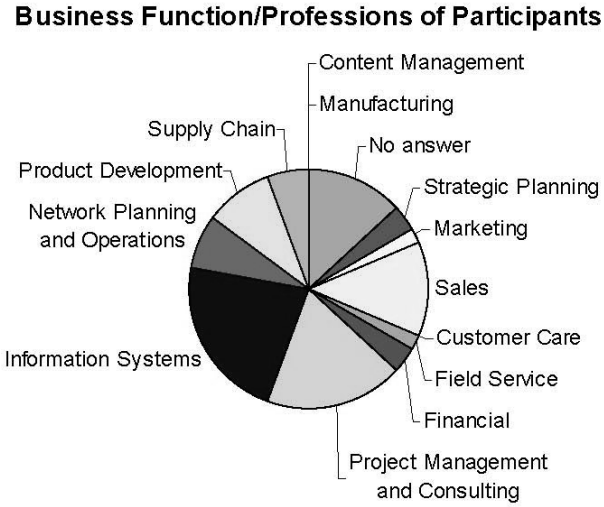


Figure 2-2 Research Questionnaire: Business Functions of the Questionnaire Participants

We have also received responses from manufacturing, distribution and retail industries, which leads us the view of the end user for many results. For the view of the teenagers and validation of the results we have combined the industry analysts and industry association reports in cooperated with the expert approaches.

The detailed analyses of the questionnaire results and the findings have been defined in chapter 5, “Findings”. Each and every questions result has been defined in that chapter briefly. The answers are classified according to the CRM framework structure which is defined to assess the effects of third generation communication applications.

3 LITERATURE REVIEW

3.1 Review of Customer Relationship Management Concepts within Communications & 3G Services Perspective

3.1.1 What is CRM?

Many vendors, consulting firm, and even companies, build their own definition of CRM. In Table 3-1 CRM Definitions samples of these descriptions are listed. While definitions are diverse, the market seems to have coalesced along three "kinds" of definitions:

- Technology centric
- Customer lifecycle centric
- Strategy centric

Table 3-1 CRM Definitions -I

Gartner Group	"CRM is a management discipline - a philosophy even- that requires businesses to recognize and nurture their relationships with customers. CRM melts customer intimacy with economies of scale. It enables the building of close relationships between the representatives of a business and its customers…"
Ovum	"CRM is a concept and a management discipline, concerned with how organizations can best retain their most profitable customers while containing costs, increasing value of interactions and thus increasing profits"
Financial Times	"Customer Relationship Management is a strategic business and process issue, not a technology solution..."

Table 3-2 CRM Definitions - II

Siebel	CRM is an integrated approach to identifying, acquiring, and retaining customers. By enabling organizations to manage and coordinate customer interactions across multiple channels, departments, lines of business, and geographies, CRM helps organizations maximize the value of every customer interaction and drive superior corporate performance.
Arthur Andersen	"Customer relationship management is a customer-focused business strategy designed to optimize customer satisfaction, revenue, and profitability. To achieve CRM, enterprises must implement collaborative processes and technologies that support customer interactions throughout all channels — e.g., marketing, sales, operations, customer service, field service, call center, and Internet. Translation: Driving the bottom line by managing relationships"

Technology centric definitions of CRM evolve out of the need for vendors to position their particular product, which often automates just a portion of the CRM problem, in the best way. These definitions include the use of technology within them. For some of these definitions, CRM is almost only consists of technology.

Customer lifecycle definitions evolve out of the need for CRM practitioners to describe a new business capability, or a new group of capabilities, that focuses on the customer lifecycle (attracting, transacting, servicing and supporting, enhancing), not the product lifecycle.

Strategy centric definitions look primarily to free the term CRM from any technology underpinnings and to a lesser extent from specific customer management techniques. These definitions describe CRM as a technique to compete successfully in the market and build shareholder value.

Couple years ago CRMGuru.com, a web based CRM community, tried to make consensus on the definition of the CRM. Hundreds of CRM experts joined to the discussion and as a result below definition is concluded. According to CRMGuru.com community, "Customer relationship management (CRM) is a business strategy to select and manage the most valuable customer relationships. CRM requires a customer-centric business philosophy and culture to support effective marketing, sales, and service processes. CRM applications can enable effective customer relationship management, provided that an enterprise has the right leadership, strategy, and culture."[1]

As Dick Lee, author of The Customer Relationship Management Planning, agrees and emphasizes on the strategy and underlines technology as one of the biggest misunderstanding about CRM. He describes CRM as "a customer- centric business strategy, which drives changes in functional roles in the company, which demand re-engineering of work processes, which is supported, not driven, by CRM technology."

3.1.2 Recent History of CRM

In 1988, database marketing technology started making its way to the desktop and "targeted direct mail" started to replace with mass mailing. In fact this was a totally promotional marketing whereas relational marketing needs the listening of customer and respond to its interests.

In the beginning of the 1990s existing ERP applications were not practical to handle the sales organizations urging demand on keeping track on customer's info. So Siebel, Clarify and other emerging software companies started to market their software which supports these requirements. By then sales and support departments actually were getting better tools other then address book software or customer cards.

In 1993, Don Peppers and Martha Rogers published their book, ", The One to One Future: Building Relationships One Customer at a Time" and cleared one-to-one (relationship marketing) concept.

Finally by 1996 sales force automation (SFA) started to shine. Synchronization and networking produced an explosion of user interest in SFA that hit in 1996 and 1997. Unfortunately it was only planned to be used in sales departments and there were not enough integration with other functions such as marketing, operational back office systems

and customer service. In his book "Customer Relationship Management Survival Guide", Dick Lee argues that, in late 1990s, database marketing concept turned in to marketing automation concept as its supporters tried to combine the relationship marketing strategies and CRM systems. However according to him this concept was much more like old, promotional database marketing in a new wrapper with the inheritance of its old habits that, marketing functions were all talk and little listening.

By 2004 CRM has not solved every misunderstandings yet, but it is working on it. Each day it is emphasizing on relationship concept. The departments in the company front office or back office are also evolving and getting used to the idea. They are trying to adapt them selves to this changing environment. Discussion on implementing the CRM concepts is the discussion of the restructuring of a bunch of process which was invented thousands years ago and evolved since then.

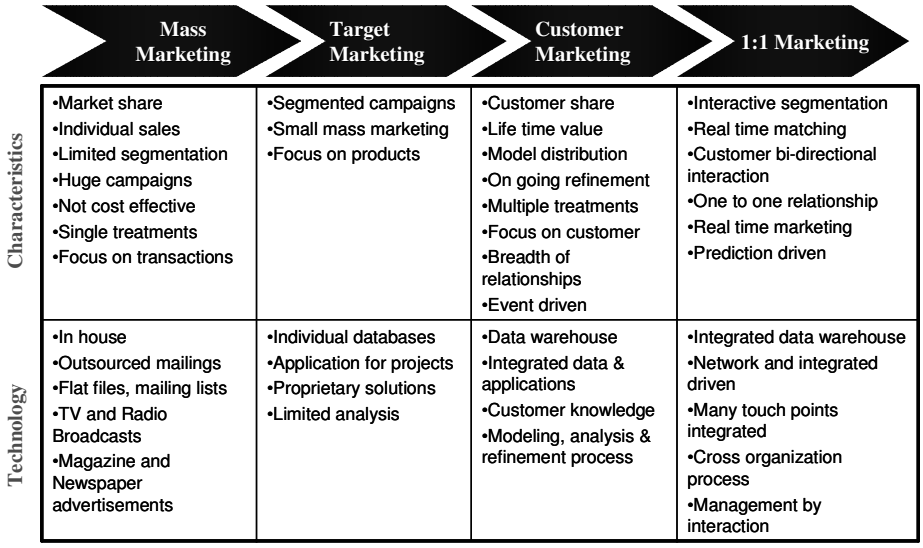


Figure 3-1 Marketing Evolution (Swift, 2001)

3.1.3 CRM Building Blocks

3.1.3.1 Value chain

The five forces model is a dynamic approach to analyzing industry structure, based on five competitive forces acting in an industry or sub-industry: threat of entry, threat of substitution, bargaining power of buyers, bargaining power of suppliers, and rivalry among current competitors. (Porter, 2002). Michael Porter proposed value chain as a tool for

identifying ways to create more customer value. Generic Value Chain identifies nine strategic activities that create value and cost in the business. The firm tries to improve its cost and performance for each value creating activity. The overall performance also depends on the coordination of the activities among different value creating activities and departments.

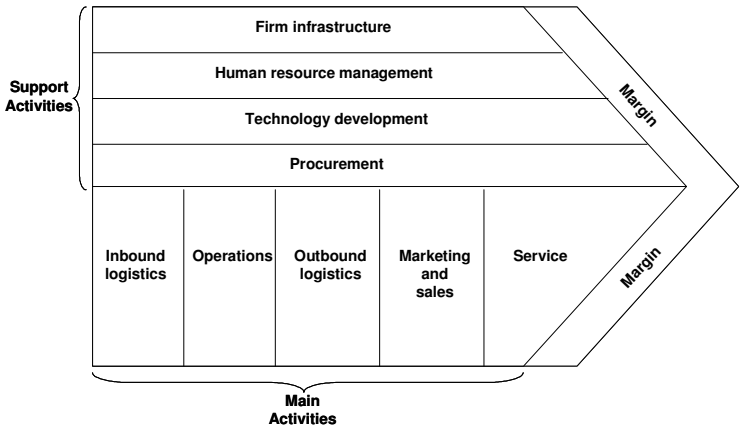


Figure 3-2 The Generic Value Chain by Michael Porter (Porter, 1985)

Michael Porter's value chain is not the only representation of value chain. In his book "Marketing management", Prenhall, 2003; Kotler argues that traditional view have the best chance of succeeding in economies marked by goods shortages where consumers are not fussy about quality, features or styles.

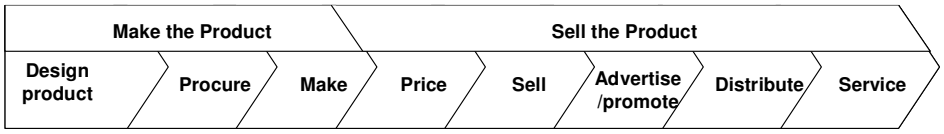


Figure 3-3 Traditional Physical Process Sequence

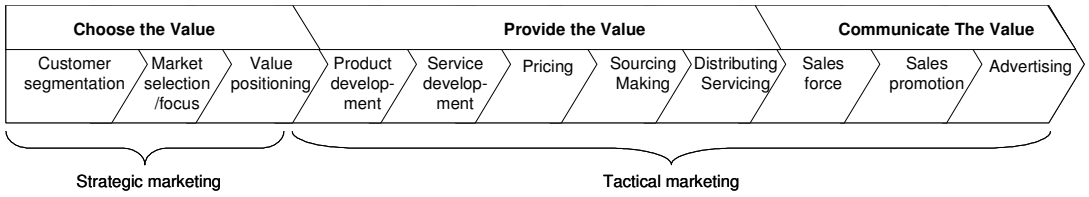


Figure 3-4 Value Creation and Delivery Sequence Process

However, a very important question to be answered is "Should consumers be followed or led?" (MIT, 2003). In one of his interview, Akio Morita, CEO of Sony, said that "Our plan

is to lead the public with new products rather than ask them what kind of products they want. The public does not know what is possible, but we do. So instead of doing a lot of market research, we …try to create a market for a product by educating (the public about what the product can do for them). ” Deming argued that “Customers do not create any thing, none of the customers had requested for electricity (before the invention of electricity.)” NTT DoCoMo’s CEO, Ohboshi faced with a troubled mobile market in 1996 in Japan (Beck & Wade, 2003). As Ohboshi recognized that the high subscriber increase rate will lead to an early saturation in the mobile market, and the handset promotions and discounts are creating very high costs and disadvantage in the market, he decided to create a new line of service which will create its own market. To identify this market he and his team mapped the current 2G services on Maslow’s hierarchy pyramid, and looked for unsatisfied needs which have more priority then the ones satisfied by now. The result was a list of needs to be satisfied. Then his team started to work on developing the selected services to be able to satisfy a portion of the listed needs which lead the 3G applications like iMode and FOMA.

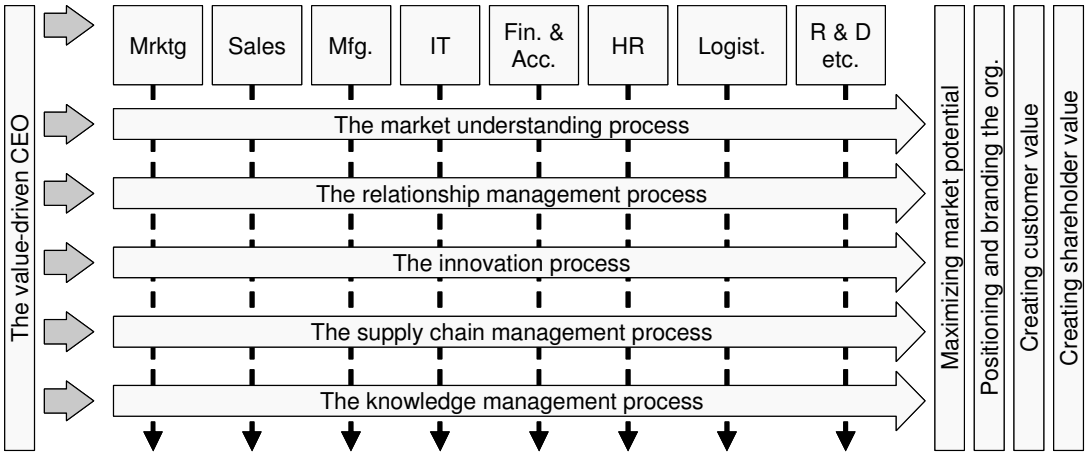


Figure 3-5 Value Creating Process - Process Driven Model (McDonald and Knox and Payne, 2001)

A broader view of value chain and value creating process is given above in the figure. This structure reminds that value is not only for customer also for shareholder as well as other stakeholders on the processes. This graphic shows that the value creating processes are interfering with every department as since they have cross departmental structure. At the end processes have four major performances which are customer value, stake holder-shareholder value, brand positioning and actualized market potential. Adding stakeholder

value to the process performance and realizing the supply chain management process separately powers the model to be applicable of the business functions in every aspect.

3.1.3.2 Six markets frame work

Figure 3-6 Six Markets Frame Work

Malcolm McDonald, Martin Christopher, Simon Knox and Adrian Payne, professors from Cranfield School of Management, define six key stakeholder markets in their book named "Creating a Company for Customers" (McDonald and Knox and Payne, 2001). According to their notes understanding of these markets and their dynamics will improve the company strategy and the competitive position.

For most organizations three groups – customers, employees (internal markets) and shareholders (influence markets) are especially critical. However as supplier relations are evolving from traditional structure to modern collaborative, partnership structure these new alliance markets are becoming more and more important then before.

Briefly, customer markets are the primary focus of marketing. They are the real customers who actually buy service and goods from the company. Internal markets are the companies own resources such as employees, departments and branches. Organizations should ensure that every department and individual provides and receives high standards of internal service. Referral markets can be classified in to two groups such as existing customers and others such as banks, competitors working in other geographic regions, consultants, law firms and suppliers. Supplier markets include both traditional suppliers and alliance partners. Recruitment markets define the potential employees or the recruitment markets. Influence markets include individuals and organizations which may have a positive or negative impact on the activities of the company. (McDonald and Knox and Payne, 2001)

In fact the realized value for share holder and customer depends on all of these six market frame work. Below this basic value creation model is given in the figure in terms of most important three aspects which are customers, employees and stakeholders.

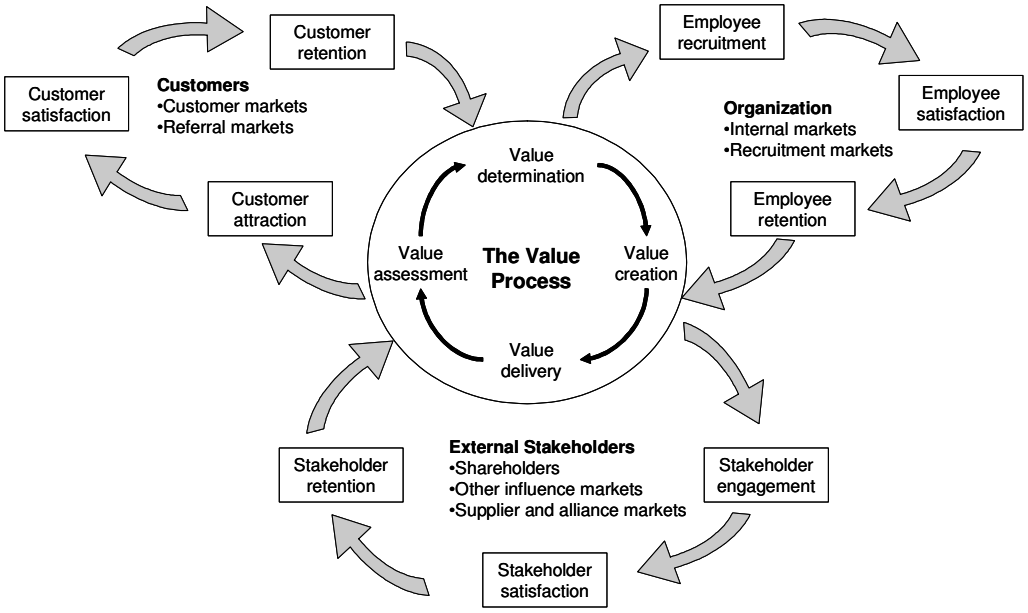


Figure 3-7 Relationship Management Value Model (McDonald and Knox and Payne, 2001)

3.1.3.3 Buying decision process

Buying process can be represented in many ways with various levels of detail. Kotler represented basic consumer buying decision process in five stage model.

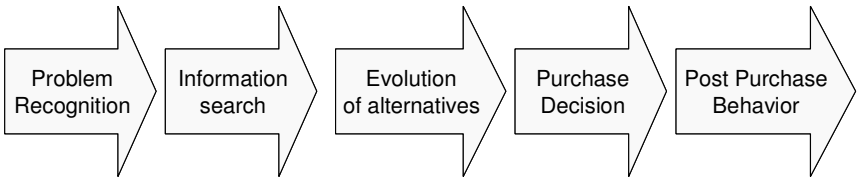


Figure 3-8 Five Stage Model of the Consumer Buying Process (Kotler, 2003)

Relationship marketing focuses on customer relationship which leads retention, customer advocate, referral markets, and customer development. These relationship approach requires heavily focus on post purchase behaviors. In this stage, there are three main concerns which are post purchase satisfaction, post purchase actions and post purchase use and disposal.

Satisfaction or dissatisfaction influence customer behavior. Satisfied customer has higher probability of repurchasing the same product or service. Also satisfied customers are more likely to work as a customer advocate or act as a referral for new customers.

3.1.3.4 Influencing factors for buying process

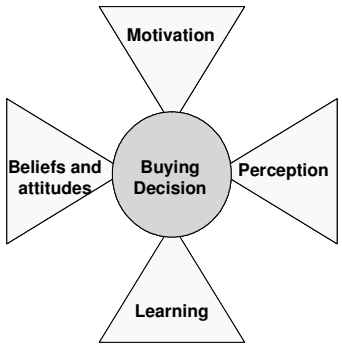


Figure 3-9 Buying Decision Motivators

Mainly there are five type of roles identified in a general buying decision process, which are initiator, influencer, decider, buyer and user. A person's buying choices are influenced by four major psychological factors, which are motivation, perception, learning and beliefs.

3.1.3.4.1 Motivation

Consumers have lots of needs which motivate them to buy goods and services. Some of these needs are biogenic and the other are psychogenic needs. A need becomes a motive when it reaches certain level of intensity. There are various theories which tries to define the motivation in terms of marketing. Freud's Theory assumes that these people's buying behavior is generally unconscious in terms of psychological influences. Consumers do not only react to the capability of product but also affected by shape, size, weight, material, color and brand name as they trigger associations and emotions. Herzberg's theory is focused on the relation between the satisfaction and dissatisfaction. He distinguishes satisfaction and dissatisfaction from each other. According to him, the absence of dissatisfiers is not enough for satisfaction.

In addition to Herzberg's and Freud's approaches, Maslow's Theory is focused on consumers needs. While he was working with monkeys early in his career, Maslow noticed that some needs take precedence over others. Maslow took this idea and created his famous hierarchy of needs. Beyond the details of air, water, food, and sex, he laid out five broader layers: the physiological needs, the needs for safety and security, the needs for love and belonging, the needs for esteem, and the need to actualize the self.

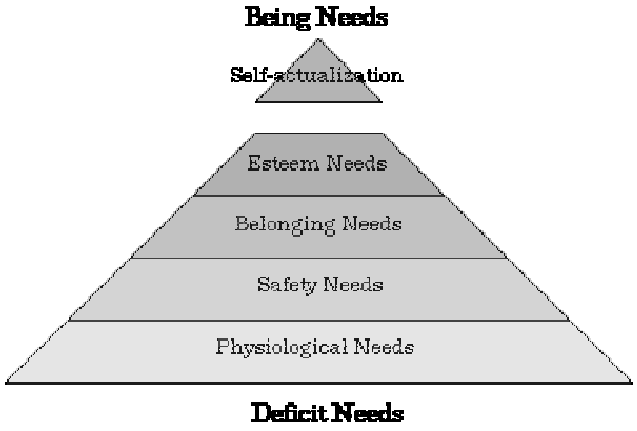


Figure 3-10 Maslow's Hierarchy of Needs (Boeree, 1998)

3.1.3.4.2 Perception

A motivated person's acts are influenced by his or her perception of the situation. An individual selects, organizes, and interprets information inputs by perception process, which creates a meaningful environment of his or her own world. Perception is not only depends on physical stimulus but also the stimulus's relation to the surroundings and conditions. Perception can only vary widely among individuals. This variation is evolved by the three steps of perception process, which are,

- Selective Attention
- Selective Distortion
- Selective Retention. (Kotler, 2003)

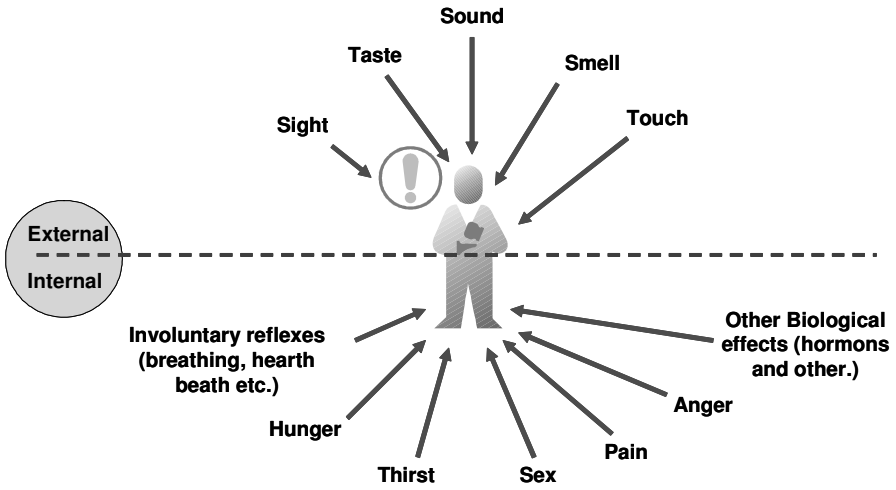


Figure 3-11 External and Internal Senses that Creates Stimulus

3.1.3.4.3 Learning

Learning theorists believe that learning is produced through the interplay of drives (internal stimulus), stimulus, cues (minor stimulus that defines when, where and how), responses and reinforcement. People act and they learn and when they learn they behave accordingly. Information is generalized by time. This will also result as a discrimination behavior as people recognizes the differences among sets of similar stimulus and adjust their responses.

3.1.3.4.4 Beliefs and attitudes

A belief is a descriptive thought that a person holds about something. People's beliefs influence their buying decisions. This belief can be either about product or brand. Awareness of brand significantly changes the buying decisions even though the consumer tests the two products before the buying decision. Brand beliefs exists in consumer's memory.

3.1.3.5 Aesthetics

Customers do not have direct access to an organization's or a brand's culture, missions, strategies, values, to the physical organization or the brand. However, customers see the public face of the organization which is mainly brand's expressions. This public face is represented by multiple identity elements with various aesthetic styles and themes through communication and touch point channels of the organizations.

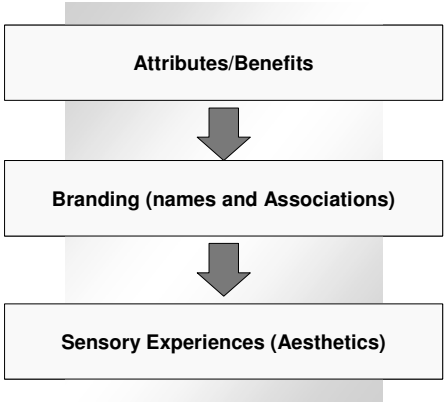


Figure 3-12 Evolution of Aesthetics (Schmitt and Simonson, 1997)

3.1.3.5.1 The attributes/benefits phase

Initially marketing focus on the benefits that product attributes provide to consumers. Normally buyers are classified according to the benefits that they seek from products. This segmentation methodology is called benefit segmentation by Kotler, in 9th edition of his Marketing Management book. (Kotler, 2003)

3.1.3.5.2 The branding phase

Brands provide an image which is associated with quality and triggers generalization or discrimination. Branding does not focus on attributes but it considers the product as a whole. Brands provide long-term values through their names and through associations that add to or subtract from the utilitarian features of a product. (Aaker, 1991) However branding is a small element of the larger picture of managing an identity and image. Branding often focuses on isolated brands and does not think in terms of the larger issues of forming corporate or multi brand identities. Moreover, it does not consider the power to move consumers in a world marked by increasingly sophisticated communications. In this world of heavy communications flow product attributes and benefits, brand names and brand associations are not sufficient to catch attention (Schmitt and Simonson, 1997).

3.1.3.5.3 Marketing aesthetics

Marketing aesthetics term refers to the marketing of sensory experiences in corporate or brand output that contributes to the organization's or brand's identity. (Schmitt and Simonson, 1997) According to Baumgarten, the term refers to a special branch of philosophy that aims to produce "a science of sensuous knowledge in contrast with logic,

whose goal is truth." Baumgarten was interested, in particular, in the impact of physical features on individuals' experiences.

Researches in Gestalt psychology, the psychology of art, visual priming, implicit memory, and automatic processing suggests that colors and shapes may affect people directly without conscious processing. (Schmitt and Simonson, 1997) Studying consumer information processing, suggests that consumers react when they are exposed to visual and other sensory stimulus. (Anderson, 1980) Same feelings and taste (gratification) can be provided by the meanings communicated.

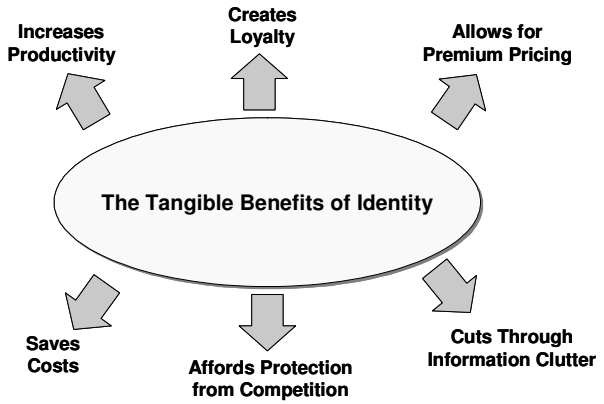


Figure 3-13 Tangible Benefits of Aesthetics(Schmitt and Simonson, 1997)

3.1.3.6 Customer segmentation and modeling

By 2000, almost in every competition is getting more brutal. Kotler calls this environment as hyper competitive market. As each human being is proud of to be individual and unique in the universe, their requests and demands also become unique within the market constraints. The competition leads companies and especially marketers to focus on this uniqueness as the customer alternatives rises in the market, and this also lead customers to become more demanding. There are various segmentation approaches below in this section we will summarize them briefly.

3.1.3.6.1 Technology adoption curve

The standard technology adoption curve, dates back to at least as far as 1930s, when Ryan and Gross studied the way farmers adopted hybrid seed corn, and to Everett Rogers's Diffusion of Innovations, first published in 1962. In their studies Ryan and Gross, observed that even though the farmers faced similar incentives, the farmers did not adapt to the

hybrid seed corn all at once. According to time and the profiles of the switching farmers, Ryan and Gross divided the farmers in five different groups which are called innovators, early adopters, early majority, late majority and laggards. (Beck and Wade, 2003)

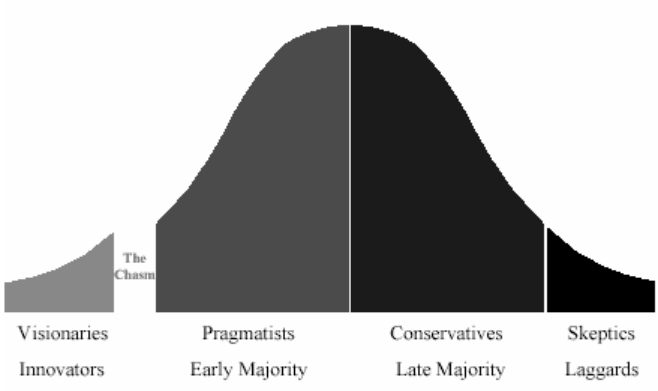


Figure 3-14 Product Life Cycle (MIT, 2003)

3.1.3.6.2 Customer pyramids

Another common classification for the customers is to classify the customer portfolio according to the revenue or profit generated by each customer and ranking them according to their transaction volume and or value for the company. This approach gives marketers capability to focus on high value generating customers to increase their satisfaction level as supporting their specific requirements.

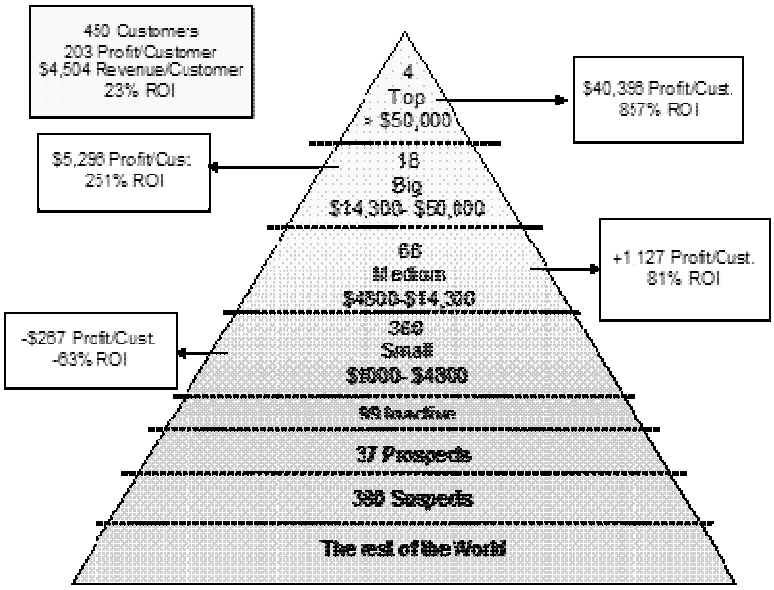


Figure 3-15 Sample Customer Pyramid (Curry and Curry, 2000)

In the Figure 3-15 Sample Customer Pyramid (Curry and Curry, 2000), customer universe is grouped according to the sales volume. As it is shown in the figure above, whereas all customers are generating revenues, it does not mean that all customers are creating profit. That's why companies must identify their most profitable customers and implement marketing strategies to be able to retain them as long as possible.

3.1.3.6.3 Personality types

Carl Jung developed a personality typology that begins with the distinction between introversion and extroversion. Whether a person introverts or extroverts, he or she need to deal with the world, inner and outer. And each individual has his or her own preferred ways of dealing with it. Jung suggests there are four basic ways, which are sensing, thinking, intuiting and feeling (Boeree, 1997)

Marketing utilized the theory of personality types to classify the customers according to their individual natural preferences which fall into one of four categories given below. These preferences leads 16 main personality types.

- An individual is either primarily Extraverted (E) or Introverted (I)
- An individual is either primarily Sensing (S) or Intuitive (N)
- An individual is either primarily Thinking (T) or Feeling (F)
- An individual is either primarily Judging (J) or Perceiving (P)

3.1.3.6.4 Life styles

Marketers are constantly on the prowl for new insights that allow them to identify and reach groups of consumers that are united by a common lifestyle. To meet this need, many research companies and advertising agencies have developed their own typologies that divide people in to groups. The most well known and widely used psychographic classification is VALS (Values and Lifestyles). (Solomon and Zaichkowsky and Polegato, 2002)

3.1.3.6.5 Segmentation

Segmentation classification process, requires indicators such as demographics, geographic and behavioral variables to identify customer groups more significantly.

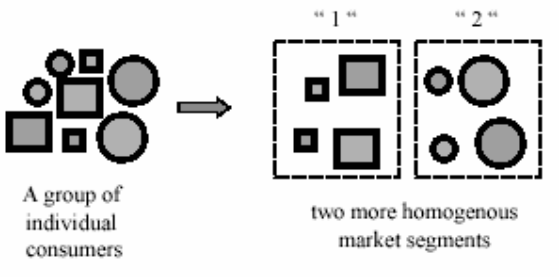


Figure 3-16 Basic Segmentation (MIT, 2003)

Below two definitions are given for term segmentation from separate sources.

Market segmentation is the process of dividing the total heterogeneous market for a product or service into several segments, each of which tends to be homogeneous in all significant aspects. Management selects one or more of these market segments as the organizations target market. A separate marketing mix is developed for each segment or group of segments in this target market. (Sommers and Barnes and Stanton, 1993)

Segmentation is grouping consumers by some criteria, such that those within a group will respond similarly to a marketing action and those in different groups will respond differently. (MIT, 2003)

The portfolio of the available segmentation parameters depend on the industry, country, company or even services and products. Each problem may require different segmentation variables independent of others.

In general, for consumer markets, major segmentation variables can be classified in four groups, which are geographic, demographic, psychographic and behavioral on the other hand for business markets major segmentation variables can be classified in five groups, which are demographic, operating variables, purchasing approaches, situational factors and personal characteristics. (Kotler, 2003)

3.1.3.6.6 Modeling

Whereas the fact that classifying customers in customer segments may help to deliver better value to them, with the increasing competition in the market combined with the more demanding customers, its effectiveness may be leveraged by the identification of the needs and expectations of the customers individually. In mobile communications, loyalty, churn, fraud, size of wallet and the value of the customer is getting higher importance day by day.

Companies are in need of identifying the valuable customers with high churn probability to prevent the profit and revenue loss in mid and long term. Unfortunately, it is not practical to assign a certain probability to a whole group of customer segment. Controversy companies need to be able to calculate the churn probability of each customer individually and then assign segments to customers accordingly. To do that normally mathematical algorithms such as decision tree, logistic regression, linear regression, partial least square estimation, PCA analysis, time series analysis, Markov chains, seasonality analysis, fuzzy modeling and neural network models are used. This knowledge producing process is called as data mining and normally covered by analytic CRM.

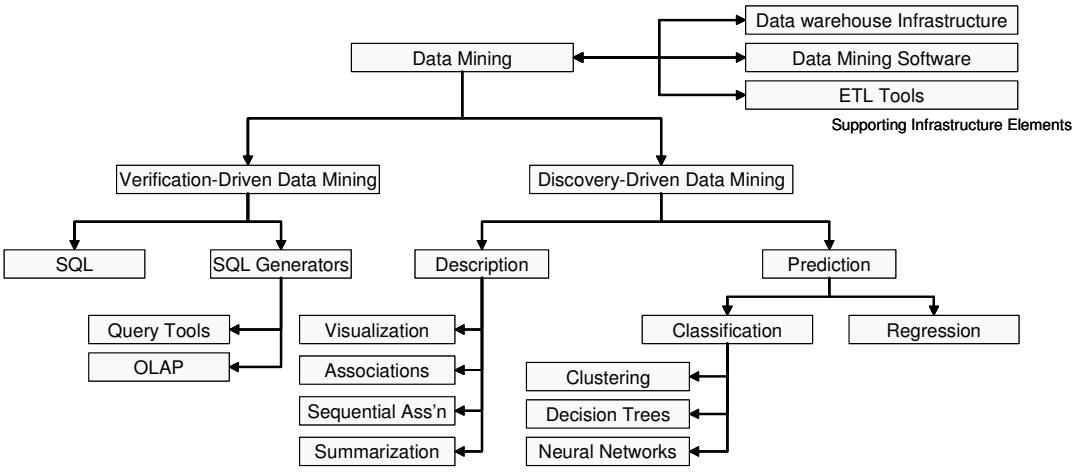


Figure 3-17 Basic Data mining Taxonomy (Swift, 2001)

3.1.3.7 Customer life cycle

CRM helps a company to address all of the types of customers it serves at different points in their life cycle and to choose the marketing program that best fits a customer's attitude toward the company and willingness to purchase its products and services. Four types of CRM programs enable the company. They are, (Handen and Brown, 2000)

- Winning back customers, who have defected or are planning to,
- Creating loyalty among existing customers,
- Developing customers with up-sell or cross-sell services
- Prospecting for new customers.

3.1.3.7.1 Win back or save

This is the process of convincing a customer to stay with the organization at the point they are discontinuing service or convincing them to rejoin once they have left. Selectivity is the essential characteristic of a successful win back campaign. Many organizations have ignored customers for their win back campaigns who had a significant decline in usage or who had discontinued some services as long as they remained customers. Many of these consumers are either reducing overall usage or, worse, migrating to a competitor's product. To preserve the revenue stream organizations are now starting to include partial disconnects and reduced-usage customers in their win-back campaigns.

Recent findings of IBM do not advices to make it hard for the customer. Consumers in communications market do not want to put their selves under obligations. Furthermore, it becomes harder to acquire a customer if the customer thinks that disconnect or churn will not be easy.

3.1.3.7.2 Prospecting

Prospecting is the effort to win new, first-time customers which is also called as customer segmentation, in many reference documents and materials. A part from the offer it self, the three most critical elements of a prospecting are segmentation and selectivity. Without this focused approach, the organization either fails to achieve an adequate acceptance or rate on the offer or spends too much on promotions, advertising and competitive pricing.

3.1.3.7.3 Loyalty

Loyalty is the degree to which customers are influenced to stay with in the company and resist competitive offers. It is the category in which it is most difficult to gain accurate measures.

Traditionally, customer loyalty has been defined as a behavioral measure. These measures include proportion of purchase (Cunningham, 1966), probability of purchase (Farley,1964; Massey, Montgomery, & Morrison, 1970), probability of product repurchase (Lipstein, 1959; Kuehn, 1962), purchase frequency (Brody & Cunningham, 1968), repeat purchase behavior (Brown, 1952), purchase sequence (Kahn, Kalwani, & Morrison, 1986), and multiple aspects of purchase behavior (Ehrenberg, 1988; DuWors & Haines, 1990). In the retailing context, following measures of customer behavior are commonly applied by practitioners – share of purchase (SOP) that measure the relative share of a customer's

purchase as compared to the total number of purchases and share of visits (SOV) that measure the number of visits to the store as compared to the total number of visits (Magi, 2003).

Other commonly used measures in the industry include Share of Wallet (SOW) – that is expenditure at a specific store as a fraction of total category expenditures (Berger et al., 1998) which is analogous to share of purchase (SOP); Past Customer Value (PCV) – based on the past profit contribution of the customer; Recency, Frequency and Monetary Value (RFM) – measure of how recently, how frequently and the amount of spending exhibited by a customer (Hughes, 1996) (Kumara and Shah, 2004).

Organizations try to prevent customers from leaving their customer portfolio and they plan their strategies to increase the loyalty. Customer life time value analysis combined with value-based segmentation allows the organization to determine how much it is willing to invest in retaining a customer's loyalty.

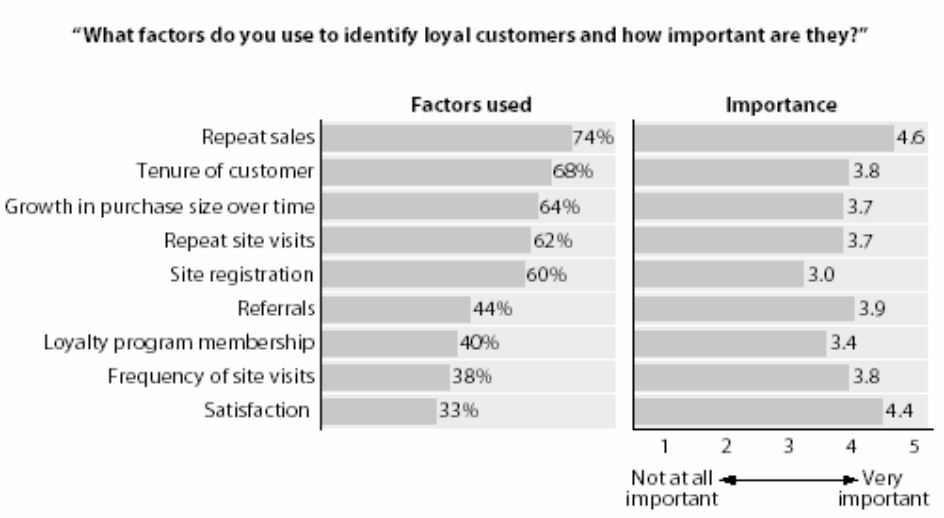


Figure 3-18 The Methods used by Marketers to identify Loyal Customers for Web Services (Vanboskirk, 2001)

Reinartz and Kumar found empirical evidence in support of Dowling and Uncles (1997) refuting the four commonly believed benefits of customer loyalty (Reichheld, 1996), which are;

- Costs of serving loyal customers are less;
- Customers are less price sensitive;

- Loyal customers spend more time with the company;
- Loyal customers pass on positive recommendations about their favorite brands or suppliers.

And they concluded that behavioral loyalty by itself can not be a measure of 'true'. (Kumara and Shah, 2004)

According to Conway and Fitzpatrick (1999), the eLoyalty Matrix, an economic model developed at eLoyalty shows that turnover is greatest with customers who are dissatisfied with the relationship they have with the company (Wilcoxa and Guraub, 2003)

Organizations should achieve a confidence level of 0.70 or greater with their churn models before implementing campaigns. Otherwise the cost will normally be far more then the potential increase in gross profit. (Handen, 2000)

A loyal customer is more likely to buy additional products or services then a new customer, they require less advertisement costs and after a while they become a customer advocate who act as a referral market on behalf of the company.

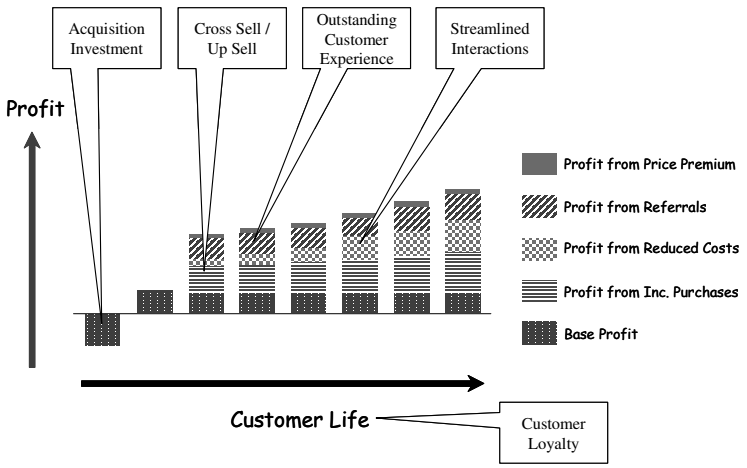


Figure 3-19 Why is CRM Strategy Important (Reichheld)

3.1.3.7.4 Cross-sell/up-sell

One of the result oriented approaches in CRM is implementing strategies which will lead an increase on customer's share of wallet. Cross-selling is identifying complementary offerings for an existing customer which he or she would like, and communicating this offer with the customer to be able to end it with a buy decision. Up-selling is similar, but instead of offering a complementary product, the organization offers an enhanced one.

Cross-sell/up-sell campaigns are important because the customers targeted already have a relationship with the organization. They are less likely to see the offer as a commodity and are thus more willing to pay a premium for it. Moreover customer becomes much more profitable and much more loyal.

3.1.3.7.5 Customer life cycle and CRM cycle

Customer life cycle basically covers the flow of stages which customer and the company interaction occur as customer climbs to the customer pyramid. (Figure 3-15 Sample Customer Pyramid (Curry and Curry, 2000)). The figure shows, a new customer enters in the system as it become aware of a need. And then searches for the satisfiers and selects the service after an information retrieve phase. Then customers purchase and receive the goods or services.

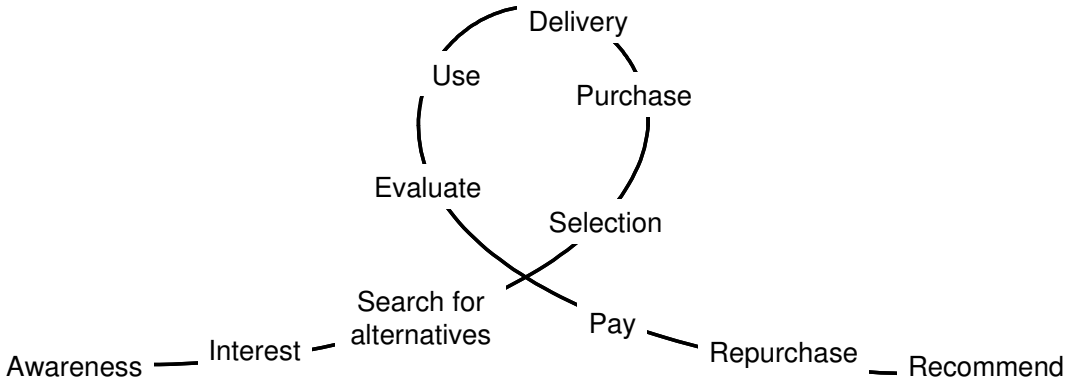


Figure 3-20 Basic Customer Life Cycle (Andersen Business Consulting, 2000)

After the use of the service, customer evaluates and make the payments. If he or she is satisfied, delighted with the service or product then repurchase it and if the satisfaction level reaches to the threshold then recommends the service or product to other prospects.

Figure 3-21 **Keeping Customer in The Loop (Andersen Business Consulting, 2001)**

Companies' retention, cross sell and up sell strategies depend on to keep customer in the loop and be able to reprocess it every time.

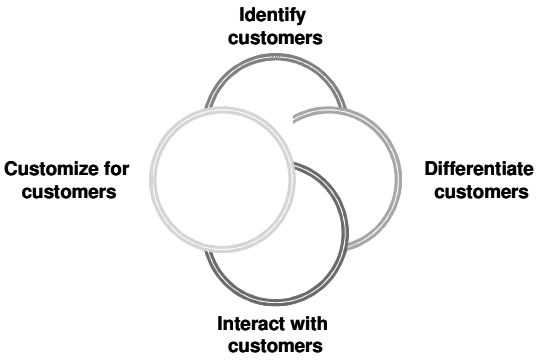


Figure 3-22 Four-Step process for Creating Customer Relationships (Peppers and Rogers 2001)

Peppers & Rogers identifies four step process for creating and cultivating better customer relationship. These four steps are identify the customers, differentiate the customers, interact with customers and customize for customers

Figure 3-23 Integrated Customer Life Cycle Management (Amdocs and Peppers & Rogers Group) (Carlson Marketing Group, 2003)

In the figure above, a more telecom focused customer life cycle management frame work is given which is prepared by Amdocs and Peppers & Rogers Group for communication industry.

3.1.3.8 CRM structure

To truly manage and leverage relationships with customers, companies must understand their customer's total experience their company not just the experience with a particular product. This involves moving beyond a typical product-centric view to the customer to a customer-centered view. Each of company's touch points, needs to reflect this new-and-improved, customer-centered point of view. (Kincaid, 1999) Building strong, lasting customer relationships as implementing required strategy, business processes, organizational structure and technologies are the key to success.

According to Dick Lee, effective CRM implementation requires a concentric pattern starting with relationship strategies and working outward with processes and organization. Technology is just the tool which is used to enable certain capabilities in the relationship processes. The success of relationship management depends on mostly strategy, people and processes.

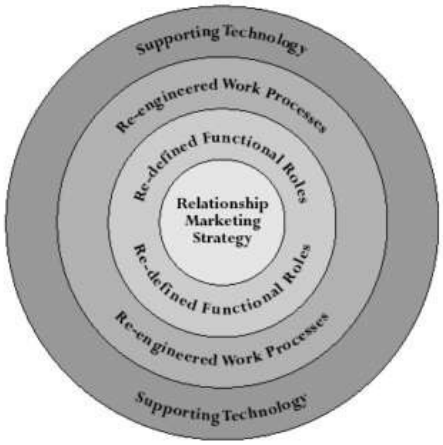


Figure 3-24 CRM Implementation Requirements (Lee, 2000)

3.1.3.8.1 Strategy

Customer relationship management begins with the development of a marketing strategy based on the critical forces that affect organizations, such as regulatory, societal, market, technological and business conditions. Generally six types of strategy is mentioned by Stanley A. Brown in his book Customer Relationship Management, which affect a CRM program: channel, segmentation, pricing, marketing, branding and advertising (Handen and Brown, 2000). On the other hand John G. Freeland addresses four critical strategy drivers for the CRM Strategy, which are identification of the customer, selecting the most appropriate channel, understanding the how all interactions with customers contribute to the company's branding value and selecting the appropriate CRM capabilities.

According to Adrian Payne and Pennie Frow, the starting point is to consider objectively who should dictate channel strategy, the customer or the supplier. According to them, in general, the customer's needs must first be considered. If customers in the firm's target segments have demands that can be satisfied best through a particular channel strategy, this should be emphasized in the firm's CRM strategy. As Butanay and Wortzel (1988) have observed, a channel strategy becomes relevant because the target customer segments want it that way. (Payne and Frow, 2004)

Our studies shows that in order to developing a multi channel strategy, following actions need to be taken in to consideration (Payne and Frow, 2004)

- Develop strategic multi channel objectives

- Understand customer and channel touchpoints to leverage advantage
- Undertake a review of industry structure and channel options
- Understand shifts in channel usage patterns
- Review channel economics

3.1.3.8.2 Process

To be able to implement CRM concept and customer centric long term value approach, the companies should reengineer their processes. Because the traditional processes are not designed according to listening customer, they are designed to be able to manage accounts and segments. Especially in bigger size enterprises strategic processes are not fast enough to respond the marketing and as Dick Lee says, this dynamic structure is tried to be performed by sales departments in the organization. As Kotler suggest the fact that marketing is not only the business of marketing department, the marketing processes requires the involvement of many different departments and business units within the company. CRM is definitely not a group of business activities only to be performed by a unique department. It is the integration of the activities and processes in a customer centric way.

3.1.3.8.2.1 Basic CRM processes

Generally main CRM processes can be classified as sales management, marketing management and customer care management processes. Sales management includes the processes which cover the sales pipe line, the planning, and the distribution of the goods and services. Marketing management basically includes the processes such as development of the marketing plan, segmentation, marketing mix planning, demand analysis, marketing communication, new product development and campaign management. Customer care processes generally manages the processes related with customer support. They manage customer inquiries, complaints, field support, activation, stolen equipment management and the other customer oriented after sales services.

The retention and loyalty is now forcing support and sales services to evolve in to a hybrid structure as the cross sell or up sell opportunities frequently occur during customer care interactions.

In telecom operating model, prepared by telecommunications management forum, customer centric processes are defined in two layers, customer interface management processes and customer care processes (sales, order handling, problem handling, customer QoS management, invoicing-collections and information system management processes.

3.1.3.8.2.2 Customer channels

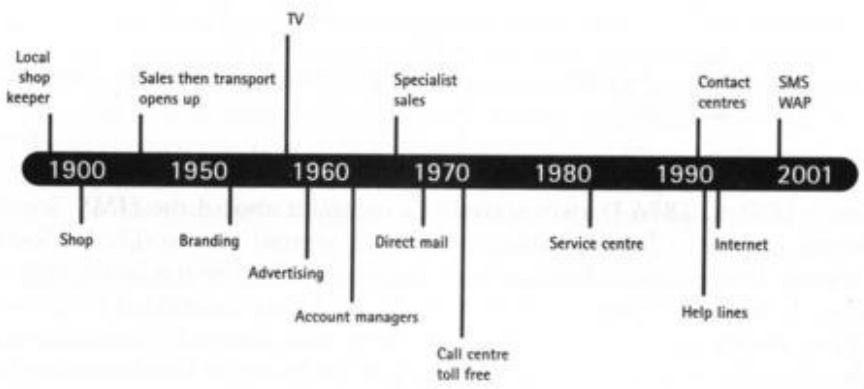


Figure 3-25 Evolution of Channels (Shaw and Ivens, 2002)

As the customer experience is a blend of a company's physical performance and the emotions evoked, customer interactions should be organized in a way that customers should feel the trust and integration independent of the channel they are connected with. In the perfect world all processes across the channels work consistently. Everything is integrated and customers do not need to choose a channel for better contact. They always sense the same aesthetic that supports the brand image even if they have extravert or introvert personality types. Moreover the company representative is very knowledgeable about anything related with the product, service and the customer's relationship with the company.

By 2004, many of channels are using different platforms and processes which are not easy to integrate with each other. Moreover, their goals and performance criteria are set individually that's why a customer using different channels has trouble while trying to accomplish his or her tasks.

That's why channel integration in terms of aesthetics, process, organization and technology is one of the most important drivers in CRM.

In order to get external information and stimulus, customers use five different senses while they are interacting with the company via company's channels. These senses are sight, sound, touch and taste.

Table 3-3 Channel vs. Senses

Channel	Channel capability
Account Manager	Sight, sound, smell, touch, taste
Marketing Events	Sight, sound, smell, touch, taste
Exhibitions	Sight, sound, smell, touch, taste
Sales Engineer	Sight, sound, smell, touch
Field Support	Sight, sound, smell, touch
Walk in Office	Sight, sound, smell, touch
Dealer	Sight, sound, smell, touch
Digital TV	Sight, sound
Internet	Sight, sound
Kiosk	Sight, sound, touch
WAP	Sight, sound
Call center	Sound

Especially during person to person communications people are used to utilize not only sound but also touch, smell and most importantly visual communications. Gestures tell what really the idea is. Intuitively, people compare the gestures and what was communicated and then trust to the idea.

The fundamental question from the customer perspective is whether the channel offers added value to the activities of the customer base such as banking. The answer relates both to the medium and the content. The content has to do with the products and services that are offered through this channel. The medium is the IT infrastructure that implements the channel. As far as the latter is concerned, each infrastructure element (Internet, telephone, cell phone, PDA) has its own inherent benefits such as software independence, mobility,

etc. Context is also very important for the customer who wants a high-quality product. (Stamoulis and Kanellis and Martakos, 2002)

IT-concepts in the form of early customer databases or CRM programs were used to support the customer interface and the key account manager. The distinctive aspect of value networks in this respect is that the touch points and interfaces to the companies' customers have multiplied. Thanks that by now the complex interaction with different parties engaged in the selling process, such as retailers, distributors, manufacturers, resellers, and web channels has been partially and or fully enabled with the help of relationship technologies (Kelly, 1998; Ehret, 2004)

According to John G. Freeland, the writer of The Ultimate Book of CRM, internet users are more likely to use customized web sites then personalized ones. In other words, customers would like to customize the web sites as they are defining their own preferences by their selves.

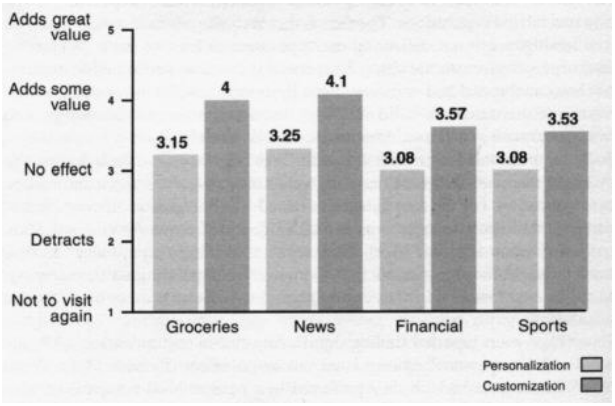


Figure 3-26 Value of Customization vs. Personalization (Freeland, 2003)

Survey also shows that customers are more likely to submit their information when they are able to control their customization preferences.

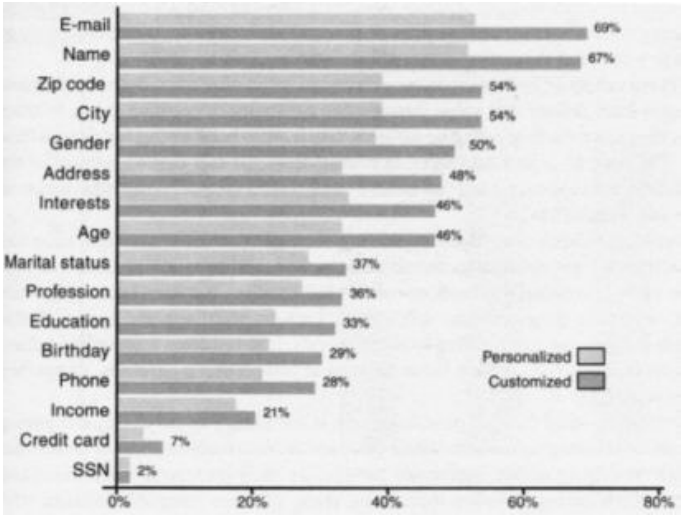


Figure 3-27 Volunteer Information Submission (Freeland, 2003)

3.1.3.8.3 Organization

As the processes change the organization which will support the processes should change also. Organizational change is a major breakthrough in CRM because the management of channels, processes, and customer segments differentiates the success of the relationship management. Creating cross discipline segment teams is effective if they are formed for the purpose of learning and executing new styles of campaigns.

Organizational change requires the change of the company culture. All departments should be aware of the importance of listening customer and should be able to organize their structure in a flexible way to instantly respond to non standard internal and external requests. According to the new processes, employees should be trained for new capabilities and processes. Motivation drivers and the performance criteria should be reviewed and reorganized.

Premiums and incentives must be reengineered. It is essential that departments within the organization work together to form metrics that reflect the new process and the collaborative nature of customer relationship management.

As channel cost management is considered to be a good cost cutting area companies are tracking for cost cutting opportunities in channel operations which leads to outsourcing, decreasing labor costs with reducing the salary rate and the number of employees. They may also lead low investment dealerships, low investment walk in offices and etc.

However the channels are the communication channels of the company. The message is sent to customer by channel service or the content of the message is not the only thing that creates the psychological motives that persuade customers to buy or create the brand image.

One of the most interesting inquiries about this point is made by Wharton School of the University of Pennsylvania. According to their news, Dell Computer has recently chosen to move some of its call center operations from India back to the U.S. The article questions that if it is reasoned by customer dissatisfaction. (Wharton School, 2003) Same article suggests that this may lead to make a selective outsource which will lead higher-value, non-customer-facing operations to be outsourced to offshore.

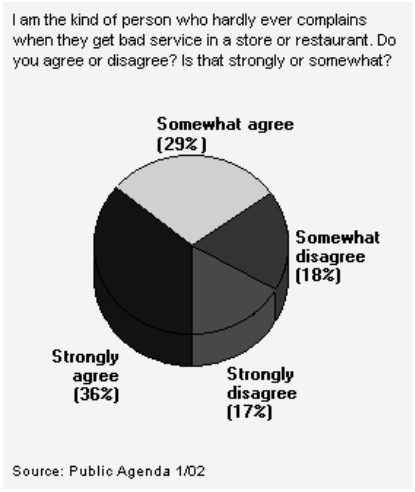


Figure 3-28 Customers Likelihood to Complain for Bad Service (Public Agenda, 2002)

In 2002, Public Agenda prepared a survey about the rudeness in America. According to findings customers normally do not complain even they get bad service. More over both customers think that customers and sales persons (channel employees) are rude to each other.

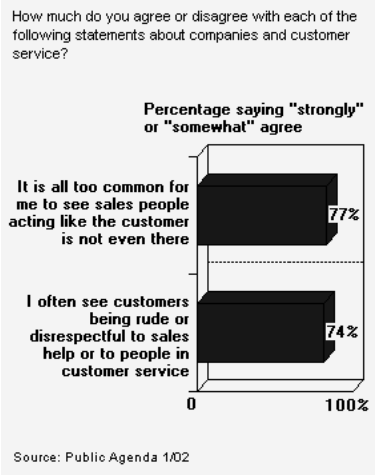


Figure 3-29 Rudeness Customers & Sales People (Public Agenda, 2002)

Another very interesting finding is about the call centers. Customer do not like VRU and IVR where they can interact with machine by phone to get their answers from pre recorded messages. Furthermore, majority of the customers think that direct sales, outbound marketing is very rude and pushy.

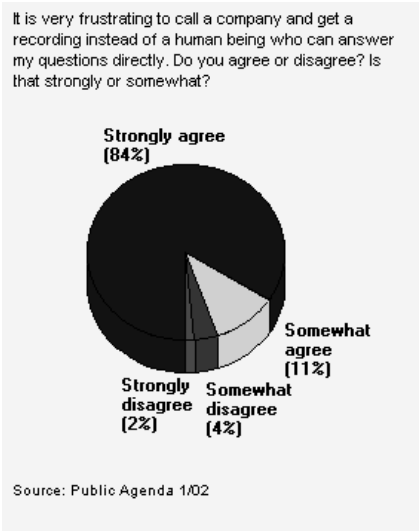


Figure 3-30 Customers do not like Talking with Machines (Public Agenda, 2002)

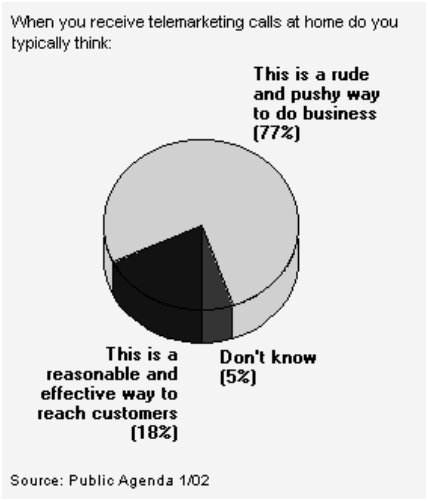


Figure 3-31 What Customers Think about Tele Marketing? (Public Agenda, 2002)

3.1.3.8.4 Technology

The technology is the tool which enables CRM processes and strategies. It does not define the CRM however technological constraints turns in to practical constraints while implementing the business processes.

The CRM information structure is an ecosystem that operates across two dimensions. Figure below shows the building blocks and components of the CRM infrastructure:

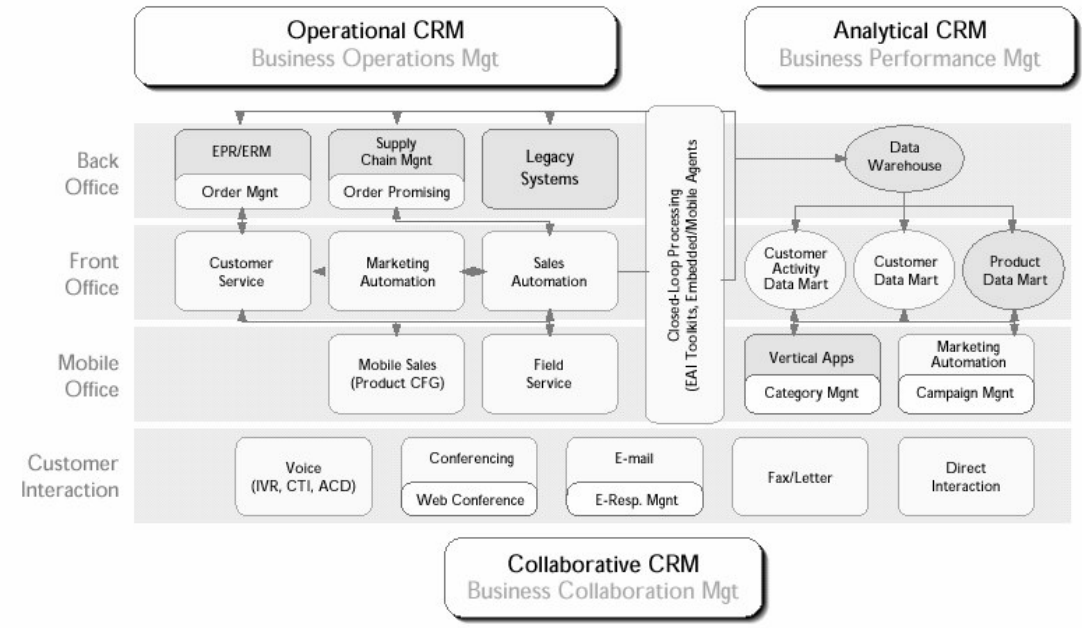


Figure 3-32 CRM Infrastructure (Meta Group)

- The customer interaction channels are the part that integrates front office operational and channels to provide integrated and align interaction platform for users. Customer interactions take place in this layer.
- Mobile Office: Normally the field processes are managed by this layer, that supports mobile connectivity and replication capabilities.
- The front office: The basic CRM operational functions are performed in front office level. This component involves all marketing, sales and customer care operational processes.
- The back office: This layer supports transactions and fulfillment. Generally third party integrations with supply chain, logistic, financial, billing, network order management operations are performed in this layer

A complete ecosystem has three main area in terms of operations. Which are extremely integrated with each other, They are:

- Operational CRM
- Analytical CRM
- Collaborative CRM.

Operational CRM is focused on the operations that support marketing, sales and customer care processes. The basic operations are performed here as integrating front-office and back-office for fulfillment. It also trades the required information flow with collaborative, channel based, operations and analytic, data mining and knowledge retrieval, operations.

Analytical CRM is focused on capturing and evaluating data, flowing from the interaction channels, front office and back office operations in order to make comprehensive analysis.

Collaborative CRM is focused on management of all interaction channels including optimization and arrangement of them according to the customer preferences.

In terms of technology, concentrating on creating a single, operations-focused, integrated logical database is one of the most important technical considerations. Other essential elements to consider are the software for the database, data mining and decision support and campaign management tools, as well as call/contact center software and hardware.

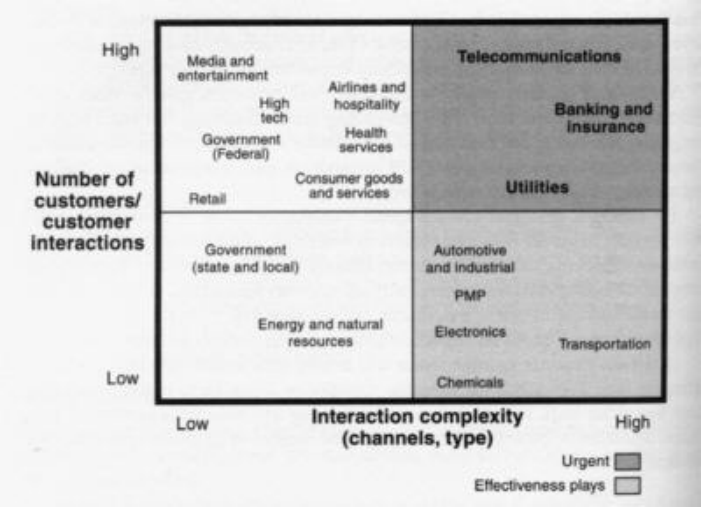


Figure 3-33 Interaction Complexity by Industry (Freeland, 2003)

Furthermore, communication industry requires use of indifferent platforms which should be used while interacting with customer to manage orders, trouble tickets, campaigns, complaints and inquiries.

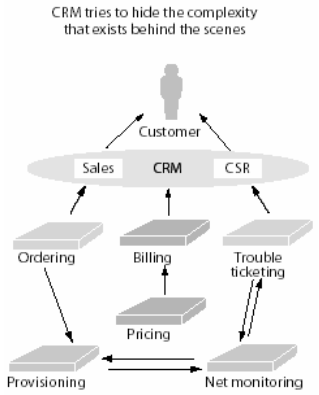


Figure 3-34 Basic Telecom CRM Systems Integrations (Williams, 2001)

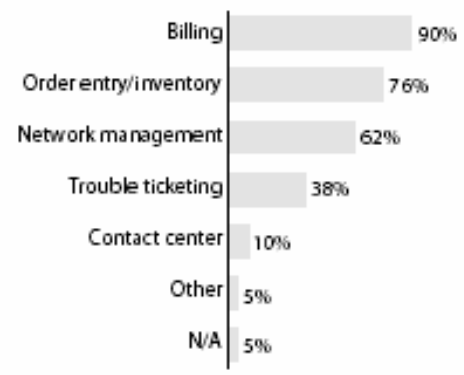


Figure 3-35 Support System that Providing Data to the CRM System (Williams, 2001)

As a result of high number of connection between many complex applications, telecom service operators are mainly focused on integration capabilities of CRM systems

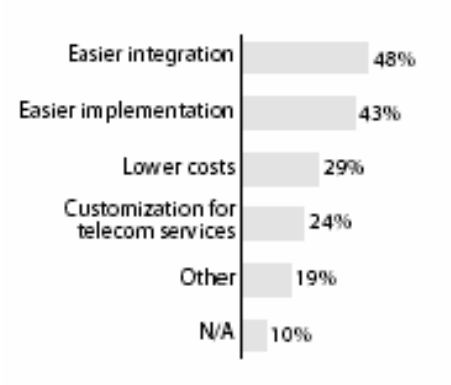


Figure 3-36 What Telecom Operators need from CRM Vendors (Williams, 2001)

3.2 Review of Proposed Business Models for 3G Services

The Telecom Operations Map serves as the blueprint for process direction and the starting point For suppliers, the Telecom Operations Map outlines potential boundaries of software components, and the required functions, inputs, and outputs that must be supported by products. The basic model continues to be stable even as the Telecommunications industry continues to change, because the Telecom Operations Map uses a high level and generic approach.

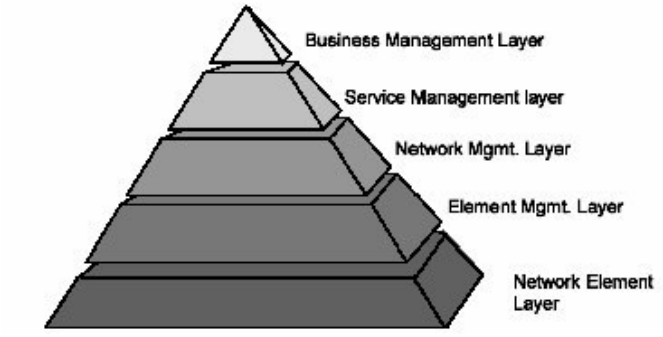


Figure 3-37 Basic TMN Layers (TeleManagement Forum, 2000)

Communications industry has also introduced the Telecommunications Management Network (TMN) model which logically defines how the business of a service provider is

managed. The TMN model consists of five layers, usually arranged in a triangle or pyramid.

The Telecom Operations Map, using the TMN model as a foundation, addresses operations support and management for any communications service from a top down, end to end process and customer oriented standpoint.

3.2.1 The Business Relationship Reference Model

Global nature of emerging telecommunication services is not only multinational, but is also becoming multi-corporation as companies extend their reach to serve larger geographical areas or to increase the range of services they can offer to their customers. Although one route to accomplish this extended reach is through direct expansion of networks and development of new service capabilities, another route is via formal or informal relationships / partnership with other providers.

For example, by December 2003 NTT DoCoMo declares that company is promoting i-mode and its third generation W-CDMA technology, and multimedia services to the world in terms of its globalization approach. To accomplish that goal it is working together with other leading organizations, while allowing know how and experience to be shared for the maximum benefit of all.

Table 4-1 Partnerships of NTT DoCoMo (NTT DoCoMo, 2003)

Application Partners:
• America Online Inc., Hewlett-Packard Company, Japan Airlines (JAL), Macromedia®, Microsoft Corporation, Oracle, SAMSUNG, Sony Computer Entertainment, Inc., Sun Microsystems, VISA
Content Partners:
• English Content Partners: News and Information (CNN, Nihon Keizai Shimbun, Inc., Bloomberg LP, Dow Jones, Bridge Japan, Weathernews, Inc., The Chosun Ilbo, People's Daily, Digital Bridge Communications, The Asahi Shimbun, STOCK SMART), Entertainment (Disney, HUDSON, USJ Co., Ltd., TELYSYS NETWORK Co., Ltd., ImaHima, Inc.), Ringing Tones (XING, KONAMI, MUSIC CHANNEL Co., Ltd.), Database (NTT Directory Services Co., Nokia Japan, Matsushita Electric Industrial Co., Ltd., OG CAPITAL Co., Ltd., Kimec), Others (Northwest Airlines, Inc., CITIBANK NA Tokyo, Tokyo-Mitsubishi TD Waterhouse Securities, ERICSSON, Federal Express) • Japanese content: thousands of content sites covering banking and financial services, entertainment, e-commerce, news, databases, and other general and specialized information.
Operating Partnerships:
• KG Telecommunications Co., Ltd. (Taiwan), KPN Mobile N.V. (Based in the Netherlands), AT&T Wireless (U.S.), Hutchison 3G UK Holdings Limited (U.K.), Hutchison Telephone Company Limited (Hong Kong), Tele Sudeste Cellular articipacoes (Brazil), Bouygues Telecom S.A., Telefónica Móviles España
Technical Alliances:
• Hutchison Whampoa Limited (Hong Kong), SingTel Mobile Pte. Ltd. (Singapore), MBNS Multimedia Technologies (Malaysia), PT Telekom (Indonesia), Smart Communications (Philippines), SmarTone Mobile Communications Limited (Hong Kong), Sonera (Finland), Telecom Italia Mobile (Italy), TOT (Thailand), NEC Corporation

Normally definition of business relationships has three main entities, which are customers, service providers and suppliers. Therefore business relationships of a simplified Business Relationship Reference Model exists between:

- Customers and Service Providers
- Service Providers and Service Providers
- Service Providers and their Suppliers

3.2.2 Process Model

Industry's common process framework for defining the relationships of individual process flows is given in the Telecom Operations Map. The Telecom Operations Map divides the Service Management layer into two parts: Customer Care and Service Development and Operations Processes.

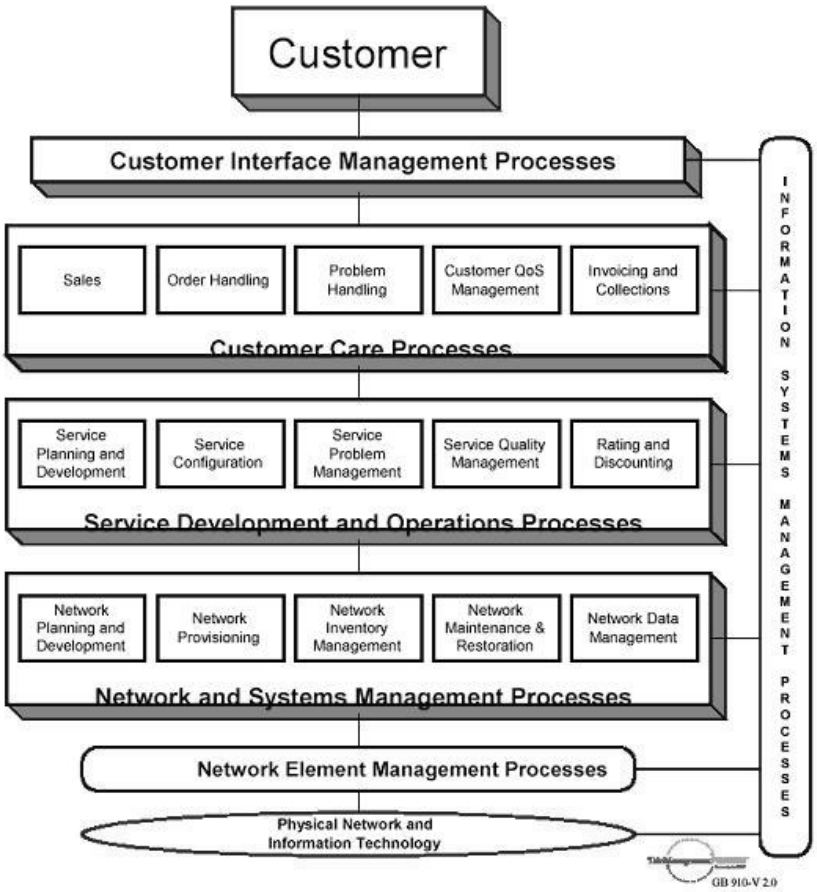


Figure 3-38 Telecom Operations Map, Business Process Framework (TeleManagement Forum, 2000)

Telecom operations management is a complex task with many dimensions. Telecom Operations Map's strength is that it simply represents the multiple dimensions of operations management, such as business process framework, business management, information exchange, business relationships with suppliers and/or other providers, systems/application and data architecture that supports the business processes.

Below a high level breakdown of the TOM framework into the three customer focused activities identified.

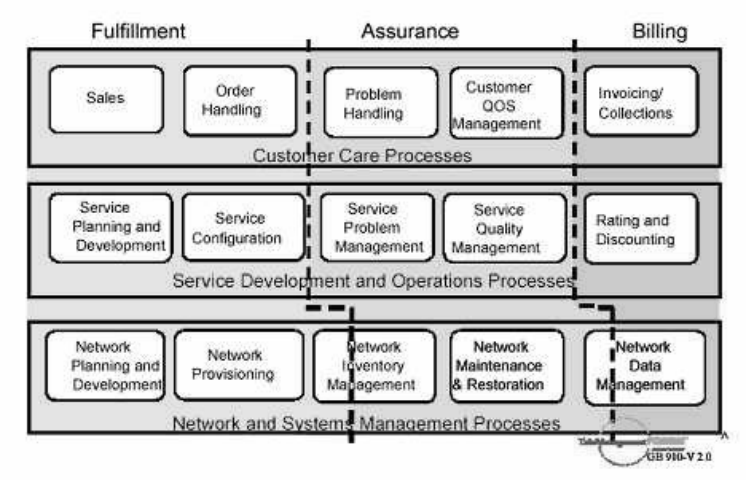


Figure 3-39 TOM Framework Customer Dimensions (TeleManagement Forum, 2000)

Common processes across services and technologies are important for

- Realizing process cost targets and process performance improvement
- Providing a consistent customer service experience
- Enable effective organizational management
- Enable cost effective process automation

Services are differentiated in the common processes by differences in process activities and information required to support the specific service. Although the TOM at the framework level is technology and service independent, in terms of services and related technologies the process may require differences.

Joint service arrangements are increasingly becoming the norm to support interconnection due to the huge growth in partnerships, alliances, mergers/acquisitions, and new entrants. Service providers may interface with different functions at multiple layers depending on:

- The degree of process automation of the service providers involved
- The service or technology being supported
- Whether an Service Provider is acting in a wholesale or retail role
- Whether an Service Provider is acting on behalf of the over all network infrastructure or in support of a specific customer service instance

3.2.3 Services and Applications

In general service evolution steps depend on the bit rate needed for the service and the capacity of the network as well as any underlying technology to deliver the service.

The basic classes defined by UMTS/3GPP are given below:

- Conversational
- Streaming
- Interactive
- Background.

The main distinguishing factor between these traffic classes lies is their sensitivity to delay

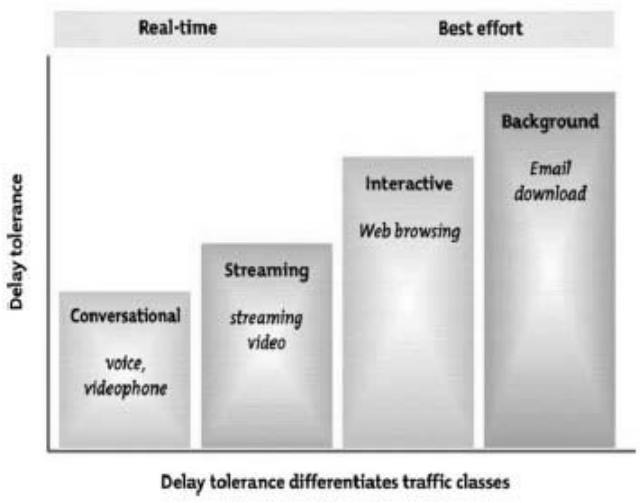


Figure 3-40 Delay Tolerance Representation

Common wireless WAN (3G) network performance characteristics

Application	Reliability	Delay	Jitter	Bandwidth
E-mail	Low	High	–	Low
File transfer	Low–medium	High	–	High
Web access	Low–medium	Medium	–	Medium
Remote login	Low	Low	–	Low
Control	Nil	Low	–	–
Real time	Low–medium	Low	Low	Medium–high

Figure 3-41 3G Application vs Bandwidth Requirement

Since, the network treats all packets equally, any flows could be hit by congestion and this particularly impinges on wireless and mobile connections, commonly as a result of limited bandwidth. Although best-effort service is adequate for some applications that can tolerate large delay variation and packet losses, it clearly does not satisfy the needs of many new time-sensitive multimedia-based applications (Baghaei and Hunt, 2004)

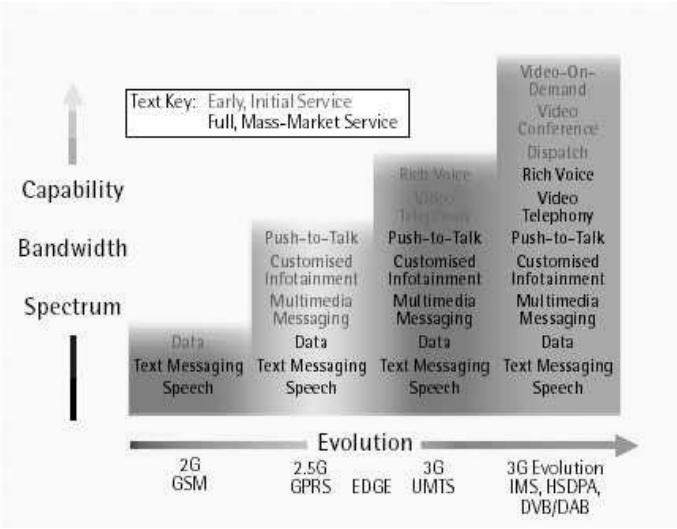


Figure 3-42 Evolution of Services towards 3G (UMTS Forum, 2003)

In many resources 3G wireless services are classified according to different aspects. Some of the sample classifications are listed below to represent the different approaches.

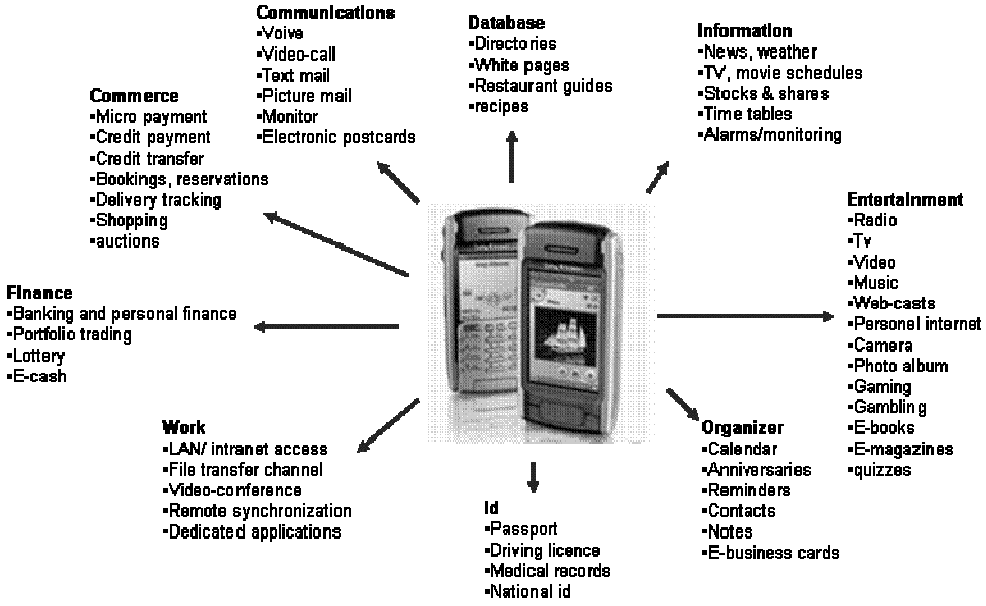


Figure 3-43 Cell Phones Applications in 3G (Raman, , 2002)

The classification, given in Figure 3-43 Cell Phones Applications in 3G (Raman, , 2002) , was presented in ITU Telecom Asia Conference in 2002 by 7.24 Solutions Inc. It basically classifies all services in nine main categories which are communications, database, information, entertainment, organizer, id, work, finance, commerce.

In their book, "3G Wireless Demystified", Harte, Levine and Kikta, classified 3G Wireless services in 12 major categories (Harte and Levine and Kikta, 2002) which are distance learning, online retail, mobile commerce, entertainment and life style, business applications, media production, security video monitoring, telemedicine, manufacturing, telephone network bypass, mobile electronic mail and targeted advertising.

Nokia, a major wireless infrastructure and hand set manufacturer, classified 3G services in 7 major groups (Nokia, 2000) which are, location-based services, Mobile Transactions, Mobile Information, Wireless Advertising, Business Solutions, Person-to-person Communications, Mobile Entertainment. According to Nokia, revenue from airtime will continue its declining and the value of the user will be complemented by transaction and advertising revenues. Nokia concludes that, there will be a feast of services launched by creative mobile operators making a hypermarket with thousands of services which can be integrated to prompt usage.

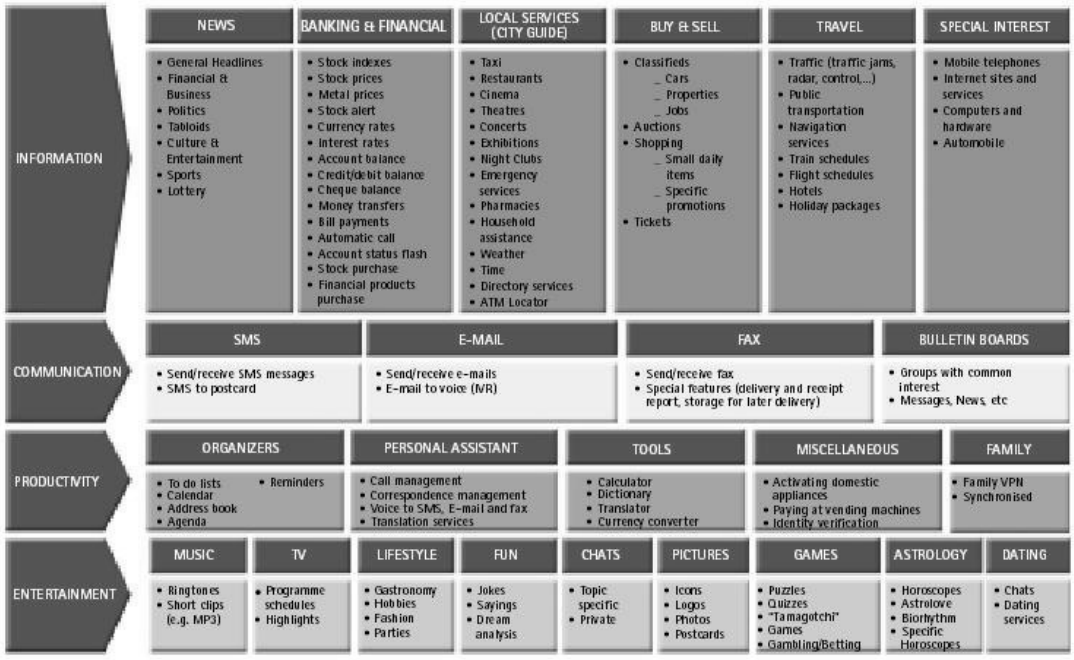


Figure 3-44 Nokia 3G Services Hypermarket Expectations (Nokia, 2000)

Lots of these services or applications may require more then one telecom capability to perform. As these capabilities represent different classification attributes, the classification of applications and services becomes complex.

UMTS Forum had recognized this complexity and issued a report in 2000 which addresses the classification of services and application for 3G Services. In report no.9, UMTS Forum introduced a distinction between services and applications.

Services will be key differentiators between services providers in the 3G environment. Users are likely to select their preferred 3G services providers based on the options available in that product portfolio. (UMTS Forum, 2000). As the number of relationships increases, by the number of users, service providers and network operators; increased level of service interaction increases the number of potential attackers and the opportunities open to them (Blanchard, 2000)

Applications are service enablers, deployed by services providers, manufacturers or users. Applications are invisible to the user. They do not appear on a user's bill. Such as a banking service. (UMTS Forum, 2000)

3.2.3.1 Service categories

UMTS Report No. 9 identified six service categories that represent the majority of the demand for 3G services till 2010. The six service categories are defined determinedly from a user perspective and are intended to reflect the perception of the market. Technological distinctions have been deliberately ignored in the service definitions.

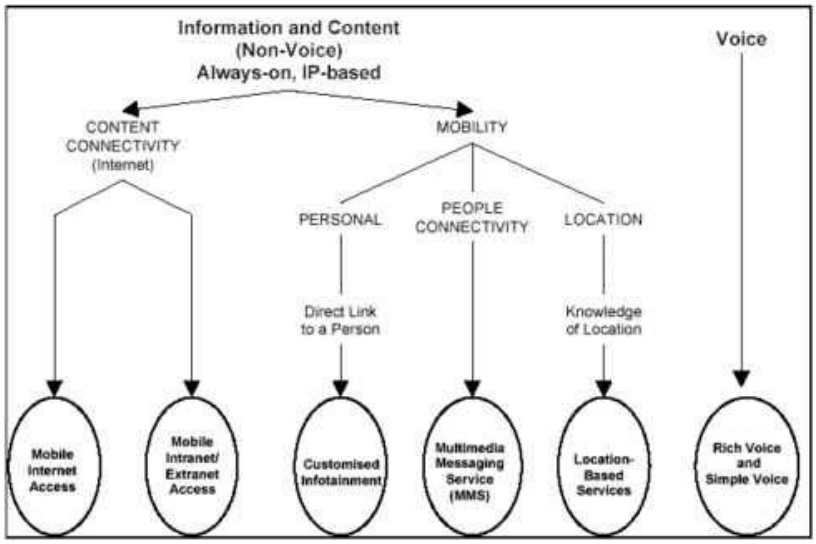


Figure 3-45 UMTS Service Categories (UMTS Forum, 2000)

Rather than the voice centric environment that has dominated the mobile world to date, 3G is rather on data environment. Enabling anytime, any place connectivity to content on the internet will clearly be an important role for 3G. Mobility is not the only benefit provided by cellular networks. Mobile cellular networks have two distinctive features that distinguish them from the fixed networks. The mobile terminal is associated with a person rather than a place, and the network knows the current location of that terminal. Association of a terminal with a person allows the provision of a whole range of internet based content services tailored to the needs of the user. Association of a terminal with a person also creates the opportunity for messaging services among closed user groups, secure transactions or specific communities of interest.

High data rates will allow the addition of videophone capabilities to traditional voice services. NTT Docomo has already implemented video phone and videoconference call with its 3G FOMA services.

Figure 3-46 NTT DoCoMo Mobile Video Conference Service (NTT DoCoMo, 2003)

The service category definitions provide a framework for analysis of market demand and discussion of industry trends. They summarize the essential differences between the mobile and fixed environments which create opportunities.

A summary of the service categories is presented below.

Table 4-2 Summarize of Service Categories – I (Adapted from UMTS Forum)

Service Name	Service Description	Market Segment Analyzed
Mobile Intranet /Extranet Access	A business 3G service that provides secure mobile access to corporate Local Area Networks (LANs), Virtual Private Networks (VPNs), and the Internet.	Business
Customized Infotainment	A consumer 3G service that provides device independent access to personalized content anywhere, anytime via structured access mechanisms based on mobile portals.	Consumer
Mobile Internet Access	A 3G service that offers mobile access to full fixed ISP services with near wireline transmission quality and functionality. It includes full Web access to the Internet as well as file transfer, email, and streaming video/audio capability.	Consumer
Multimedia Messaging Service	3G service, that offers non-real time, multimedia messaging with always-on capabilities, personalization, and user-to-user networking and allows the provision of instant messaging. Targeted at closed communities that can be services provider or customer defined.	Business and Consumer
Location-Based Services	A business and consumer 3G service that enables users to find other people, vehicles, resources, services or machines. It also enables others to find users, as well as enabling users to identify their own location via terminal or vehicle identification.	Consumer and Business
Rich Voice and Simple Voice	A 3G service that is real-time and two-way. It provides advanced voice capabilities (such as voice over IP (VoIP), voice-activated net access, and Web-initiated voice calls), while still offering traditional mobile voice features (such as operator services, directory assistance and roaming). As the service matures, it l includes mobile videophone and multi media communications.	Consumer and Business

A typical mobile operator in the year 2000 ran about a dozen or two dozen applications. With 3G, it is expected that the mobile operator will be managing thousands of applications.

3.2.3.2 3G applications

There are some acronyms which have been developed to describe the drivers of mobile internet applications. Below we are discussing some well known approaches which are PAIR, MAGIC, 0-1-2-3, 5M and General Classification.

PAIR, defines consumer application drivers on a mobile device. The letters stand for Personal, Available, Immediate, and Real time. Available means that the information or service can be reached. Of course, available information may also be immediate and real time, but it does not have to be. Information can be available and distinctly not immediate nor real time, such as the availability of yesterday's newspaper. Personalization means the filtering and customizing the data according to the needs of the person who uses the device. Immediate refers that the information or service reaches you when it is relevant. And real time stands for the most up-to-date version of the information that exists.

On the other hand, NTT DoCoMo have suggested that applications have to be MAGIC. (Mobile, anytime, globally, integrated and customized). The MAGIC formula provides a path for migrating or creating new mobile internet applications. The main addition to PAIR is being global in MAGIC. DoCoMo argues that all applications must be global or globally aware, and their integration should be provided.

Ericsson has offered the 0-1-2-3 system for designing applications that are intended to work on a mobile phone. (Ahonen, 2002)

Another model is 5Ms model, which was defined by Ahonen & Barret, Movement - escaping the fixed place, Moment - expanding the concept of time, Me - extending myself and my community, Money - expending financial resources, Machines - empowering gadgets. According to them any application that brings value through any one of the 5 M's has potential for success as a mobile application. Killer applications are expected to use most if not all of the five.

Nokia has also its own driver definition, according to Nokia, operators need to consider the following four key criteria for applications as they build the infrastructure which, will provide maximum end user value in the mobile world:

- Applications must provide timely information.
- Transactions must be simple to complete.

- Applications should be relevant to location.
- Applications should be personalized.

Below application are classified generally to be simply defined as conferencing, messaging, internet access - networking, location based, entertainment, financial applications, information applications, mobile commerce and ASPs.

- Conferencing: Mobile Video (Streaming), Mobile Telephony, Simple Voice, Teen Video Chat (Non Real Time), Video Conferencing, Voice Over IP, Voice Portal, Voice-Activation.
- Messaging: E-mail/ Messaging, E-mail Receipt, E-mail Transfer, Instant Messaging/ Message Aggregation, Machine to Machine, Mobile Chat, Mobile Instant Messaging, Mobile Postcard, Multimedia Messaging, Short Message Service, Streaming Video/Audio (Non Real Time), Unified Messaging
- Internet Access/ Networking: Application Synchronization, FTP Transfers, Internet, Intranet, Mobile VPN, Web Browsing
- Location-Based Application: Car Navigation, Localized Info (Current User Location), Localized Info (Future/ Planned Route), Location Sensitive (Billing/ Routing), Location-Based M-Commerce, Promotion, Navigation/ Location, Telematics, Tracking/ Personal Security, Virtual Mouse/ Directional, Wand and Fleet Management
- Entertainment: Downloadable Ring Tones/ Graphics, Entertainment, Internet Games, Mobile Music, Online Dating, Online Gambling, Adult Entertainment
- Financial Application: Financial Services, Financial/ Banking, Mobile Cash, Mobile E-Bill, Mobile E-Salary, Stock Trading
- Information Services: Alerts, Dictionary Research, Directories, Emergency Applications (E911), Flight Reservation, Info Applications, Instant Weather Forecast, M-information (user statistics), Multimedia (video, audio real time), Personal Information Management (PIM), Restaurant Guide, Yellow Pages, Virtual Home Environment (VHE)

- Mobile Commerce: Advertising, B2B Business Data Applications, Ewallets & Shopping Enhancements, Just the Ticket, M-Commerce Transactions, ME Commerce, Micro-Payments, Mobile Retailing, Transaction Processing
- Application Service Provider Applications: Web based ERP, CRM, and other specific legacy system access and hosting.

In the provision of payment mechanisms for mobile services and applications, banks could be potential competitors. (Preeza and Pistoriusb, 2002)

The evolution of 3G-networks signifies a shift towards open and easily accessible network architectures, which raises major security concerns. Thus, all stakeholders are interested in the security level supported in 3G-systems because of the identified risk that prospective users might perceive 3G-networks as not trustworthy, and not use them. (Xenakis, Merakos, 2003)

3.2.3.3 Killer applications

Wharton public policy and management professor Gerald Faulhaber is pessimistic about the future of 3G. He asks the question what kind of pocket instrument will use broadband? He says small handsets are not exactly the optimal feature for a system that promises rich media delivery. The user interface on a mobile terminal is less comfortable and less convenient for the user to control and to interact with the applicable services (Figge, 2004). Rajeev Chand, a wireless technologies equity research analyst for Rutberg & Company, believes that 2.5G is adequate for the near term, at least in the U.S. In Europe, however, voice capacity may drive 3G. According to him carriers might see capacity reach critical levels for GSM systems and then start to invest in 3G for capacity enhancements. Dave Williams, vice president of strategic planning for Cingular Wireless thinks that spectrum will not be an important constraint in the near future as operators have excess capacity. He thinks that for enterprise space killer app is e-mail with mobility. Not surprisingly, fully 84% of the wireless experts believe e-mail access is an indispensable feature affecting consumers' use of the wireless Internet. (Fife, 2003) However, he argues that most of these services can be deployed over GPRS networks.

According to Lifestream research, existing non voice mobile services can often be successfully used for mobile working. However, many non voice applications are graphics

intensive and as the new faster data services such as 3G will allow better versions of today's existing non voice applications. Mobile Lifestreams expects that since consumer electronics devices as their name suggests appeal to consumer markets and will have 3G built in. They suggest that 3G will be a consumer revolution but not a corporate one.

According to Figge, the concept of situation dependency that applies features specific to mobile computing as ubiquity provides a leverage for the acceptance of new wireless applications (Figge, 2004)

The most ideal bearer for each application is listed in the table, given below.

Table 3-4 Optimal Bearers for Mobile Services – I (Mobile Lifestreams, 2001)

Application	Preferred Bearer
Voice over IP (VoIP)	3G
Moving Images	3G
File Transfer	3G
Downloading Software	3G
Virtual Home Environment	3G
Web Browsing	GPRS/ 3G
Document Sharing/ Collaborative Working	GPRS/ 3G
Audio	GPRS/ HSCSD/ 3G
Home Automation	GPRS/ 3G
Remote LAN Access	GPRS/ 3G
Electronic Agents	GPRS/ 3G
Dynamic Authoring	GPRS/ 3G
Job Dispatch	GPRS

Table 3-5 Optimal Bearers for Mobile Services - II (Mobile Lifestreams, 2001)

Application	Preferred Bearer
Still Images	GPRS
Information Services- Qualitative	GPRS
Unified Messaging	SMS/ GPRS
Internet Email	SMS/ GPRS
Chat	SMS/ GPRS
Remote Monitoring	SMS/ GPRS
Instant Messaging	SMS/ GPRS
Mobile banking	SMS/ GPRS
Corporate email	SMS/ GPRS
Information Services- Quantitative	SMS
Affinity programs	SMS
Simple Person to Person Messaging	SMS
Voice and fax mail notifications	SMS
Prepayment	SMS
Ringtones	SMS
Electronic commerce	SMS
Customer Service	SMS
Vehicle Positioning	SMS
Over The Air	SMS
People Location	SMS
Remote Point of Sale	Circuit Switched Data

The thesis questionnaire findings are also in parallel with the above table. According to the participants of the questionnaire rich media services, entertainment and especially video conference will be a killer application.

3.2.4 Business Models

3.2.4.1 MVNO operating models

"Imagine Manchester United as an MVNO in the UK. It has a very strong brand with millions of fans; it would be easy to make people buy personalized team handsets. I'm sure operators couldn't do anything to stop them. In that case, if you can't fight it, you'd better ally with it." - Benelux operator (Forrester research, 2001)

According to Forrester research MVNO is a company that buys network capacity from a network operator to offer its own branded mobile subscriptions and value-added services.

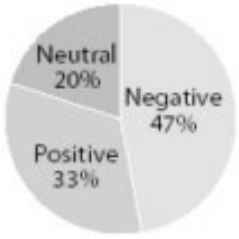


Figure 3-47 Are You Positive or Negative About the Entrance of MVNOs in the Market?

According to a survey result covering the telco operators in Europe, very few of telecom operators are actually supporting the entrance of MVNOs in the mobile communications market. According to them brand management and channel management will be the major success factors for the new entrants as an MVNO.

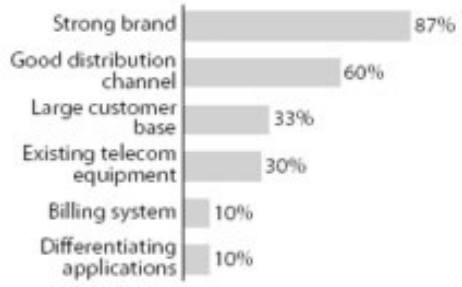


Figure 3-48 What Type of Assets should a Company have to be Successful as an MVNO?

Table 4-6 MVNO Operating Models(Forrester research, 2001)

	Light Model	Medium	Heavy
Access	The MVNO fully depends on the host for network access and SIM-card issuance	The MVNO issues its own SIM cards that give it control over on-screen branding and SIM-based services	The MVNO has its own network elements and switches that give it call control. The host only provides radio spectrum and coverage
Services	The MVNO depends on the host for roaming, provisioning, and billing but offers its own value-added services. The host provides customer care for network issues, the MVNO for other issues	Although the host handles roaming, the MVNO provides provisioning, billing, customer care, and value-added services including SIM-based services. Network services come from the host network	The MVNO has full control over all services and negotiates its own interconnect and roaming agreements with other operators

3.2.4.2 Basic 3G business models

While many agree that the commercial success of a 3G network will be linked to subscriber acceptance of wireless data services, there is not yet agreement on the right business model for these services.

According to Motorola (Edwards, 2002), it was assumed that mobile operators might have to choose to be a content provider, content packager or a value added service provider in addition to their traditional voice services. However with the enhancement of mobile internet Motorola accepted a five level business understanding model approach according to the required integration levels, which are hosted, allies, friends, competitors and strangers. In hosted structure applications are provided by a mobile operator for the benefit of customers. In Allies the level of integration is on company level. Mobile operator

performs the billing in financial transactions. Friends level is for the one whom a revenue sharing arrangement is in place. Competitors are the applications which compete with hosted applications provided by a mobile operator. And strangers is those with no business arrangement is in place, usually enterprises who are using the network as a public data transport network for their own purposes.

Another alternative business model classification is described by Accenture. According to Accenture there will be six main business models for 3G mobile service providers which are, Access and transport provider, Content & service aggregator, full ecommerce player, payment collector, mobile office enabler (b2b), application service provider (b2b). These business models will be realized in six value model stages which are, content & services, content & services aggregation, mobile network, hardware & software platforms, handsets & appliances, distribution & retail, end user. Each model has its own level of integration with those stages. Below is the definition of each of these six models that defines the mobile commerce.

Table 4-7 3G Business Models, Accenture - I (Accenture, 2001)

Access and transport provider	The operator essentially acts as a pipe. Transactions for electronic goods are passed through the operator without knowledge of such transactions. End users receive two different bills, one from the operator for network usage and the other for the fulfillment of goods from the separate vendor.
Content & service aggregator	The operator moves down the value chain to provide services and packaged content from other providers. Since transactions are known to the operator, commissions could be made to the operator by the external provider for the value added/enhanced by the operator.
Full ecommerce player	The operator manages the transaction and financial aspects of the sale, providing a single bill to the end-user. Payment of content provided by external providers is settled in a separate agreement.

Table 3-6 3G Business Models, Accenture (Accenture, 2001)

Payment collector	The operator acts as a connector between for the external provider and the end user. The operator is entrusted with managing the financial flow between parties and is not involved in the actual fulfillment of delivered goods.
Mobile office enabler (b2b)	Enables corporations to mobilize their workforce over the operator's network. The employees access their corporate systems over a secured channel on the network.
Application service provider (b2b)	The network operator could expand its presence in the IT field by becoming an application provider, which provides hosting and managing packaged application software to corporate clients.

Another model which this thesis is going to focus on is introduced by UMTS Forum, a frame work of mapping of service categories to business models. UMTS Forum identified three business models for mobile services providers that will evolve with 3G They are,

- Mobile ISP
- Mobile Portal (Portal Focused Approach)
- Mobile Specialized Services

These three business models indicated in figure below, illustrate different approaches to the market that may be adopted by 3G services providers. They reflect the characteristics of the market segment served by the specific service category as well as the partnering strategy of the services provider. Defining business models in this way allows for a rational and consistent approach to modeling and forecasting the service revenue potential.

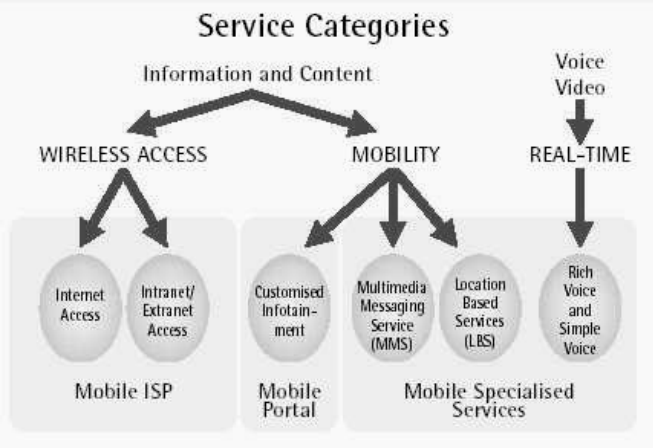


Figure 3-49 UMTS Forum Service Classifications (UMTS Forum, 2003)

The three business models can be characterized by their positioning along the 3G services value chain shown below. As presented, 3G services provider using a portal focused approach aggregates and customizes portal content, providing third-party billing as well as mobile and IP network access with end-user billing. A 3G services provider using an access focused approach only provides the mobile and IP network access with end-user billing. Mobile specialized services can be offered by any type of services provider at any point in the value chain.

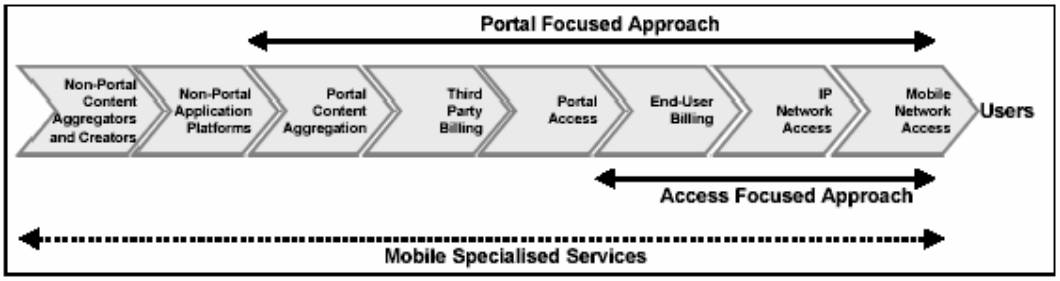


Figure 3-50 Coverage of UMTS Forum's Business Models on Value Chain

In actual practice, a services provider can provide any combination of elements, and provide as much wide range of services within any element as desired.

3.3 Review of Telecommunication & CRM Markets

To be able to understand he future effects of 3G on CRM in Telecommunication industry it is also important to understand the Telecom Industry and CRM market trends. However future expectations are not always very trustful. Therefore we have summarized the our review including multiple sources to validate our assumptions. Below, some of the

estimations in terms of telecom industry, mobile market and CRM is summarized to define the general assumptions within the market.

3.3.1 Communication Market in Global

According to ITU World Telecommunication Development Report in 2002 mobile communication is increasing more rapidly then fixed line telephone lines and in some countries mostly in Europe, the number of mobile subscribers became more then fixed line telephone subscribers even in 2001.

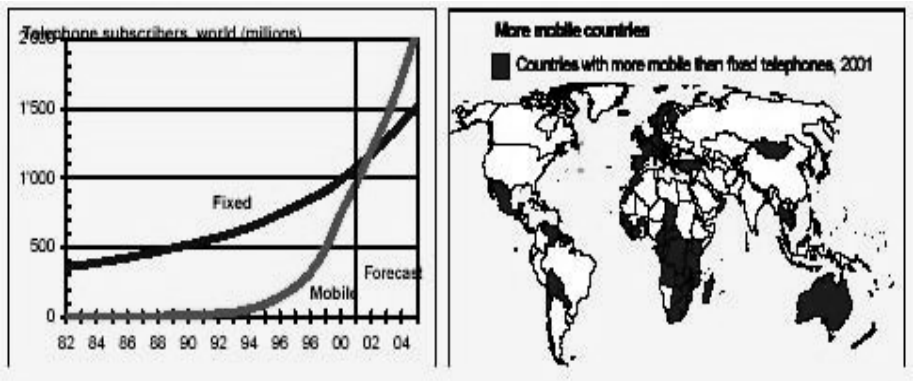


Figure 3-51 Mobile Communication Takeover (ITU, 2003)

Fragmentation and a high number of competitors are typical of all emergent industry environments. As an example, in early Finnish telecommunications, however, the political arrangements between the Finnish administration and Russia's Telegraph dramatically accelerated competitive efforts. In 1900, there were 50 telephone companies in Finland. In the following decade, this have fold to 250. At the eve of World War II in 1938, the number of Finnish telephone companies increased to 815 (Steinbock,2001). And then by the competition in the market number of telecom companies has reduced as the rivals consolidated their power in few operators.

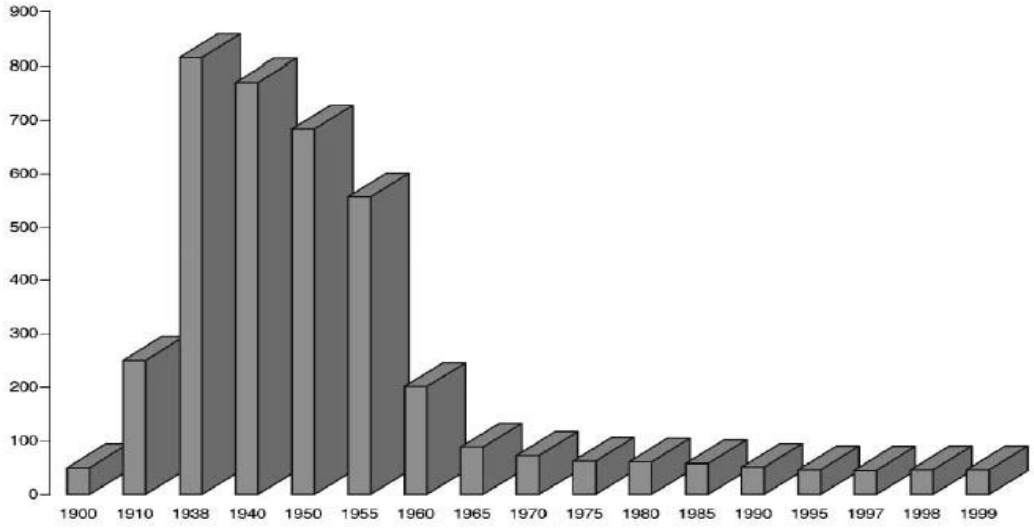


Figure 3-52 Number of Finish Telecom Companies (Steinbock,2001)

Below in the figure world wide telecom figures are summarized in terms of revenue and number of subscribers by ITU. It shows that by 2003 total mobile subscribers would be more then 1.2 billion fixed line subscribers. It also shows that the related revenue will also increase substantially and will reach to the fixed line telephone services revenues. This table also shows that equipment market is just the 22% of all telecommunications market. Which means that, the majority of telecommunications market in terms of total revenues, is shared by mobile and fixed line services almost equally. Graphic also shows that international calls have a small share on telephone revenues, whereas the compounded annual growth rate of international revenues is higher then compounded growth rate of telephone services revenue even though the fiber networks and wide broadband enhanced the international call capacity and decreased the costs significantly. Another very important point is the ratio of personal computers and internet users. It seems that number of internet users have increased very rapidly how ever they have almost reached to the total number of PCs. And probably number of PCs will become a constraint for internet users growth trend if an alternative method of internet access is not provided. In these terms wireless internet becomes a good alternative as it has twice the number of PC and higher growth rate then PCs. Capabilities of high bandwidth of 3G is seen to be promising as an alternative to PC communication.

Key Global Telecom Indicators for the World Telecommunication Service Sector													
	1991	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	***2002***	***2003***
Telecom market revenue (current prices and exchange rates), US$ Billions													
Services	403	448	470	517	596	672	712	767	854	920	968	*1'020*	*1'070*
Equipment	120	132	135	158	183	213	234	248	269	290	264	*275*	*300*
Total	**523**	**580**	**605**	**675**	**779**	**885**	**946**	**1'015**	**1'123**	**1'210**	**1'232**	***1'295***	***1'370***
Telecom services revenue breakdown (current prices and exchange rates), US$ Billions													
Telephone	331	350	359	386	428	444	437	456	476	477	472	*465*	*455*
International	37	43	46	47	53	53	54	56	58	60	63	*65*	*68*
Mobile	19	26	35	50	78	114	142	172	223	278	317	*364*	*414*
Other	53	72	77	81	89	114	133	139	155	165	180	*190*	*200*
Telecom services capital expenditure (current prices and exchange rates), US$ Billions													
Total	124	130	135	138	161	174	177	177	186	198	201	*205*	*215*
Other statistics													
Main telephone lines (millions)	546	572	604	643	689	738	792	846	905	983	1'053	*1'129*	*1'210*
Mobile cellular subscribers (millions)	16	23	34	56	91	145	215	318	490	740	955	*1'155*	*1'329*
International telephone traffic minutes (billions)	38	43	49	57	63	71	79	89	100	118	127	*135*	*140*
Personal computers (millions)	130	155	175	200	235	275	325	375	435	500	555	*615*	*650*
Internet users (millions)	4.4	7	10	21	40	74	117	183	277	399	502	*580*	*665*

Figure 3-53 Key Global Telecom Indicators for the World Telecommunication Service Sector (ITU, 2001)

Below the top 20 telecom vendor is listed in terms of their revenues by 1999 to represent the major players in the vendor market.

Table 3-7 Telecom Equipment Players - Top 20 in 1999 (ITU, 1999)

Rank 1998	Company	Headquarters	Telecom equipment revenue		
			US$ billion	% change 1997-98	As % of total sales
1	Lucent	USA	26.8	16.50%	89%
2	Ericsson	Sweden	21.5	10.00%	95%
3	Alcatel	France	20.9	14.20%	84%
4	Motorola	USA	20.5	-0.70%	70%
5	Nortel	Canada	17.3	11.70%	98%
6	Siemens	Germany	16.8	10.70%	25%
7	Nokia	Finland	14.7	59.40%	94%
8	NEC	Japan	12.6	-13.10%	31%
9	Cisco	USA	8.4	31.20%	100%
10	Hughes	USA	5.7	19.70%	96%
11	Fujitsu	Japan	5.7	-14.80%	13%
12	Samsung Elec.	Korea	5.5	8.80%	33%
13	3Com	USA	5.4	-3.30%	100%
14	IBM	USA	5.1	4.00%	6%
15	Matsushita Con	Japan	4.3	4.00%	58%
16	HP	USA	3.2	9.70%	7%
17	GEC	UK	3.1	8.30%	24%
18	Qualcomm	USA	2.9	65.20%	86%
19	Bosch	Germany	2.8	0.00%	10%
20	Italtel	Italy	2.2	-12.80%	95%
	Top 20		**205**	**10.30%**	**40%**

Top 20 fixed lines operators in terms of their number of local loop subscribers are listed below to give information about the market players in fixed lines market in 1999.

Table 3-8 20 Fixed Telephone Line Operators 1999 (ITU, 1999)

Rank	Operator (Country)	Main telephone lines			Telephone service revenue			
		Total (000s)		Change 1998-99 (%)	Total US$ Million		Change 1998-99 (%)	As % of total revenue
1	China Telecom (China)	108'716		24.40%	18'995.7		7.10%	69.00%
2	NTT (Japan)	62'865		-0.10%	54'511.1		1.20%	59.60%
3	SBC (United States)	60'682		62.90%	37'576.0		69.20%	75.90%
4	Deutsche Telekom (Germany)	47'800		2.80%	17'790.8		-18.50%	46.90%
5	Bell Atlantic (United States)	43'000		3.40%	24'086.0		...	72.60%
6	France Télécom (France)	34'100		0.30%	14'563.2		-4.00%	50.30%
7	BT (United Kingdom)	28'485		1.60%	15'377.4		-4.80%	43.50%
8	Telecom Italia (Italy)	26'502		2.00%	17'006.3		-15.20%	59.00%
9	GTE (United States)	26'068		11.10%	15'101.0		1.10%	59.60%
10	BellSouth (United States)	24'477		1.90%	17'772.0		8.40%	70.50%
11	KT (Korea (Rep.))	20'518		2.10%	4.3		-10.70%	0.00%
12	Türk Telekom (Turkey)	18'054		6.50%	2'579.0	[98]	106.40%	75.60%
13	DOT (India)	17'940	[98]	24.60%	3'715.4	[98]	18.20%	86.90%
14	US West (United States)	17'009		2.50%	11'059.0		11.20%	83.90%
15	Telefónica (Spain)	16'480		1.20%	7'483.4		-1.80%	30.60%
16	Chungwa Telecom (Taiwan-Chi	11'712		4.40%	4'573.0		-16.10%	74.40%
17	Bell Canada (Canada)	11'579		2.80%	6'259.1		4.10%	74.10%
18	Telmex (Mexico)	10'878		9.60%	6'409.8		-3.40%	63.60%
19	Ukranian Telecom (Ukraine)	10'074		3.90%	...		...	
20	Telstra (Australia)	9'760		2.30%	5'458.1		0.60%	46.40%
	TOP 20	**606'699**		**10.90%**	**280'320.6**		**-12.40%**	**73.40%**

The telecommunications market outside the United States is expected to grow by 2003 as reversing declines during 2001 and 2002. (The Telecommunications Industry Association (TIA), 2003) Spending on landline transport services are beginning to be cannibalized by wireless services. (The Telecommunications Industry Association (TIA), 2003) Wireless services revenues comprise 42 percent of total transport services spending outside the U.S. in 2002. Moreover international spending on communications transport services is expected to reach $788 billion in 2003 which is a 10.5 percent increase over 2002, accompanied by a 2.7 percent up tick in international spending on telecommunications equipment to $247 billion in 2003. (ITU estimations is higher then $247 billion, which is $300 billion). By growth in wireless and support services, the overall telecommunications market internationally is positioned for a healthy 10.3 percent compound average growth rate (CAGR) through 2006. While a combination of factors conspired to hold down the telecommunications market in 2001 and 2002 such as slow economic growth, financial problems faced by major carriers, high fees for wireless licenses, excess capacity and low corporate profits, Telecommunications Industry Association believes that the underlying demand for telecommunications remaining strong. Internet traffic continues to grow rapidly; the need at the enterprise level for high-speed data transmission continues to grow; and the demand for mobile connectivity for both voice and data is expanding. Analysts believe that largest regional market outside North America will be Asia/Pacific with total telecommunications revenue expected to reach $421.6 billion in 2003, up from $380 billion

in 2002. This market is projected to grow at a 9.1 percent clip through 2006. However because of the diversification, Japan continues to exhibit only modest market growth while China and India are growing rapidly.

Furthermore, Western Europe, the second largest regional telecommunications market outside North America, is expected to see revenue of $362 billion in 2003 -- up 5.8 percent over 2002. The market in Western Europe is experiencing some of the same problems as the U.S. market, but still presents opportunities. Despite the difficulties faced by many of the carriers resulting from the third generation cellular (3G) spectrum auctions, operators in Europe are beginning to plan their strategies for rolling out advanced wireless networks - including 3G and unlicensed wireless local area/wide area networks (WLANs/WWANs). This trend is being facilitated by the decision to allow wireless carriers to share infrastructure. Furthermore, broadband rollout is also beginning to accelerate in Europe and is expected to reach 10 percent penetration by 2002. (The Telecommunications Industry Association (TIA), 2003)

Among all of the global regions, Eastern Europe is experiencing the most rapid increase in growth in wireless, having reached 45 million subscribers in 2001. This equates to a penetration rate of 11.3 per 100 inhabitants, still lower than the 72.5 percent penetration experienced by its neighbors in Western Europe.

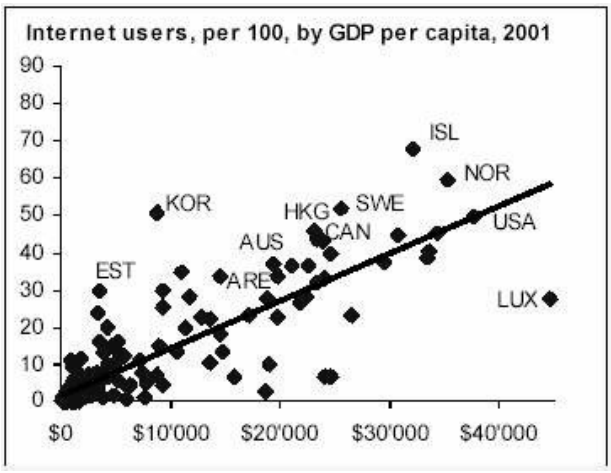


Figure 3-54 Internet Penetration vs. GDP per Capita in 2001 (ITU, 2002)

ITU analysts suggest that there is a correlation between GDP per capita and the number of internet users per 100 people. It means that as GDP per capita increases in a country that country's population has become more online. That's why economic growth in the world

especially with the low income countries will enable more internet users to meet internet and become online.

However for mobile users graphic is more dispersed. It seems that GDP per capita is not the only driver. The cultural differences, life style differences and existing infrastructure differences may be affecting the mobile penetration.

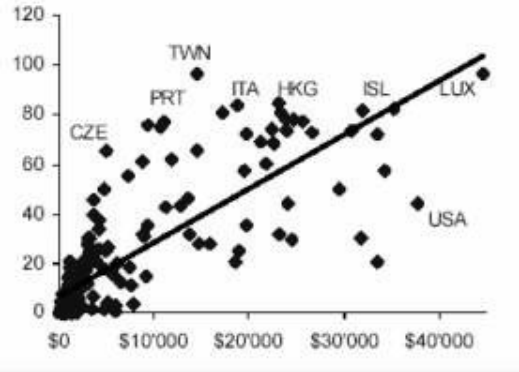


Figure 3-55 Mobile Users Penetration (%) vs GDP per Capita in 2001 (ITU, 2002)

On the other hand, ITU studies show that bandwidth has a direct positive impact on mobile internet penetration. As it is shown in the graph countries have high mobile bandwidth has more mobile internet penetration.

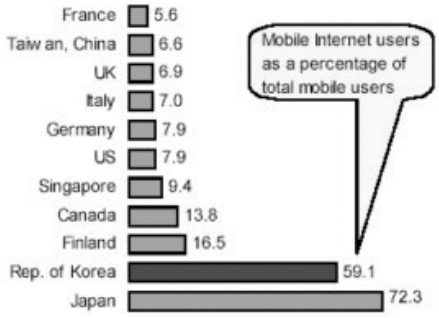


Figure 3-56 Mobile Internet Penetration by Countries in 2001 (ITU, 2002)

According to Forrester Research, bandwidth will continue to be a scarcity as it is not satisfied by end to end connection. Forrester research suggests that the improvement of storage and performance capacity is not met by bandwidth

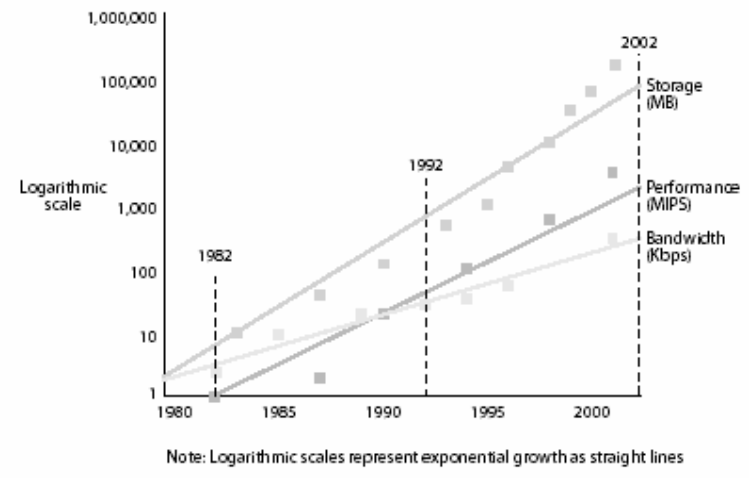


Figure 3-57 Bandwidth Improvements Lags Processing and Storage Advances (Howe, 2002)

Even fiber promised high bandwidth capacity as whole network does not depend on fiber on access and metro level there became a bottle neck for high bandwidth requiring connections.

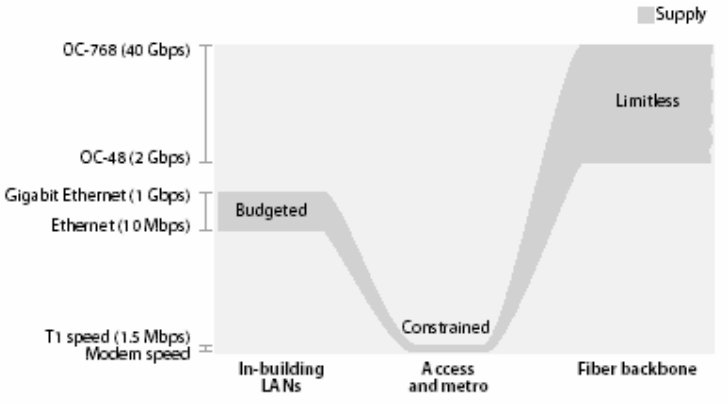


Figure 3-58 Last Mile Bottlenecks (Howe, 2002)

Forrester discuss that, the 2 Mbps pipes promised by 3G wireless networks promise to fill in the last mile beyond the reach of fiber. But 3G rollouts still expected to take years because of political wrangling over the new cell towers required for high-speed data, and actual data rates delivered to the user will be substantially lower than the peak rates cited by vendors. (Forrester, 2001)

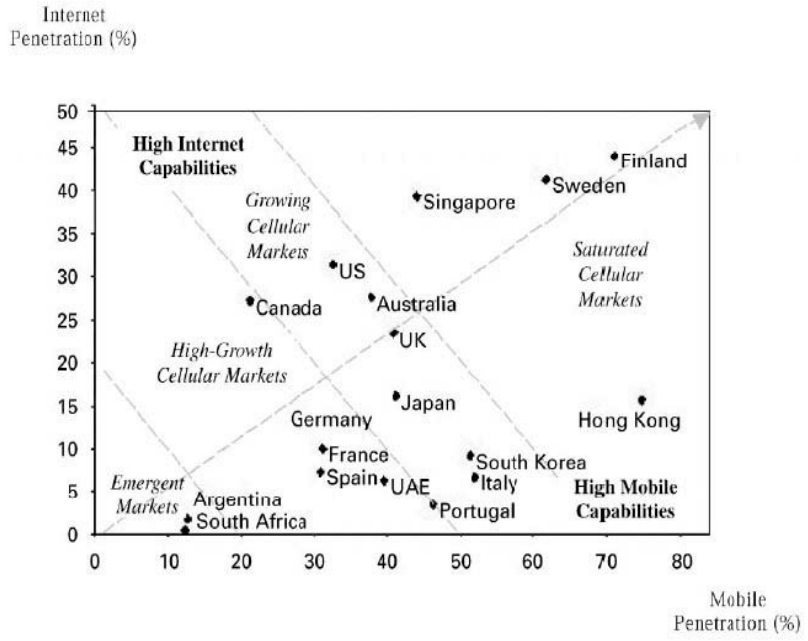


Figure 3-59 Internet Penetration vs Mobile Penetration

3.3.2 Cellular Communication Market

Depending on the nature of the path-dependent evolution of the regional market, some of high-volume markets were moving toward 3G with relatively high Internet capabilities (e.g., US, Canada), while others relied on relatively high mobile capabilities (e.g., Hong Kong, South Korea). Though saturated, Nordic countries provided potential high-value opportunities (Steinbock, 2001).

3.3.2.1 Handsets

According to Dr. Elizabeth Fife, Principal Researcher in University of Southern California, convenience and simplicity are the most important features for handheld users while selecting a mobile device. As it is represented below performance, productivity and synchronization comes just after.

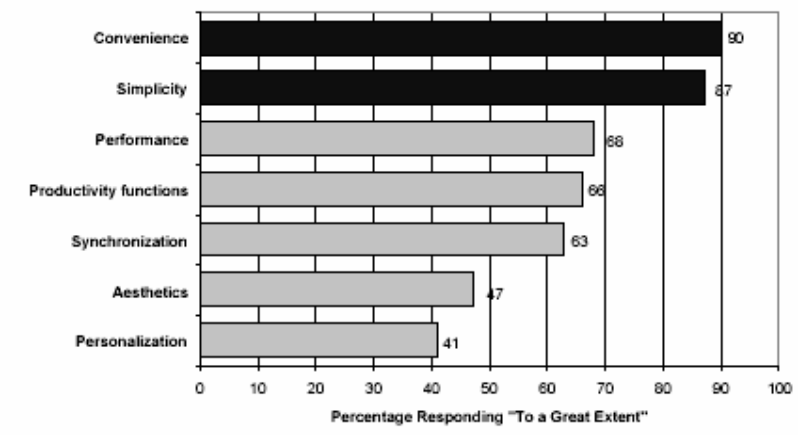


Figure 3-60 Factors Driving User Preferences for Handheld Devices (Fife, 2003)

In terms of internet connectivity, Forrester reports that normally over 70% of personal computers are used by one or more people in homes in Europe, which also show that personal computers are not much personal. Same research also reports that there are many mobile phone users who have no access to PCs in their houses. As a result we can conclude that effective use of wireless internet on handheld devices may result as more connected users in the internet.

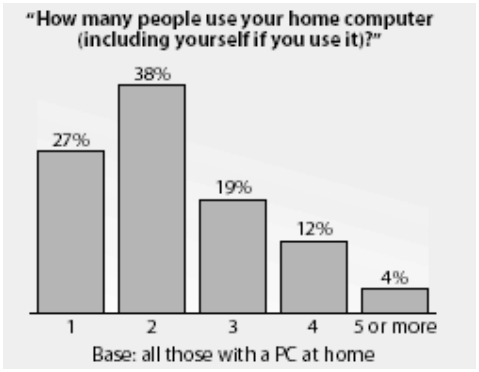


Figure 3-61 European Home Computers are shared by other Household Members (Forrester Research, 2001)

Practical experience shows that the GSM standard tightly constrains the variation in devices and uses to which they put; the vast majority of 2G mobile telephones do more or less the same thing. A mere glance at the dazzling array of 3G devices being designed

Nokia, Siemens, and Sony discloses no such uniformity. 3G devices come with or without cameras, with or without PDAs, with or without full keyboards, with or without substantial internal computing capacity. To generalize the issue somewhat, UMTS and 3G standards

allow for considerable latitude and hence uncertainty about the dominant designs of the future in all of the following areas: (1) the hardware devices carried around by wireless Internet users; (2) the associated software applications, including the entirely unresolved issue of their distribution among central servers and local mobile devices; (3) the dominant nature of system interconnections on 3G networks: between 3G portable devices and ISPs, among 3G handhelds, between 3G handhelds and telephones, between 3G handhelds and public network access points or between automobile-mounted 3G devices and ISPs (Lehrer, 2004)

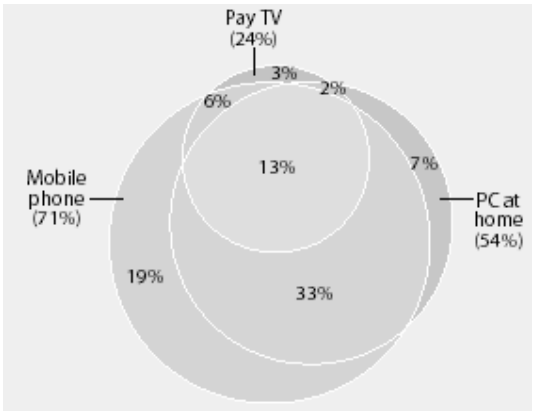


Figure 3-62 PC and Pay TV owners have Mobile Phones (Forrester Research, 2001)

3.3.2.2 Networks

According to EMC world cellular database by September 2003, there were 1.29 billion mobile subscribers mostly using TDMA and GSM accesses for their mobile communication. Almost 40 percent of these mobile subscribers are living in Eastern Asia and almost 26.8% is living in Europe. According to these reports North America has not a big market in terms of number of subscribers, comparing with Europe and Eastern Asia.

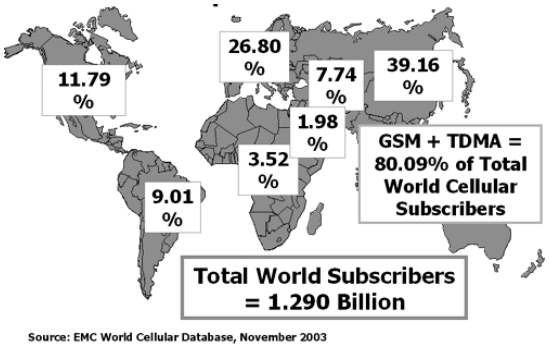


Figure 3-63 World Cellular Subscriber Distribution September 2003 (EMC, 2003)

According to same source, over 920 million of subscribers are using GSM and less then 14% is using CDMA, which makes GSM the globally most popular service in the world. In terms of digital subscribers, total number of WCDMA, GSM and TDMA subscribers reach to 82% of global digital subscribers. EMC also suggest that there are 1.75 million WCDMA (3G) users in the world by September 2003.

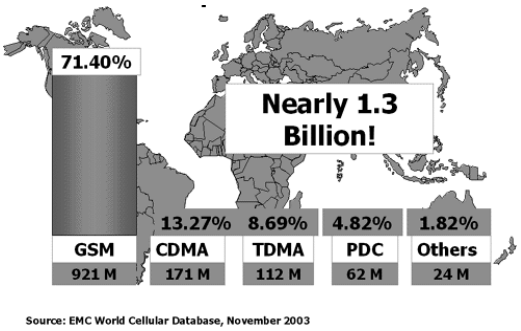


Figure 3-64 World Cellular Subscribers September 2003 (EMC, 2003)

Below, a comparison between GSM and CDMA network figures are given. It shows that world wide 592 operators and 203 countries are supporting GSM phones.

Figure 3-65 Global Technology Statistics (EMC, 2003)

According to EMC by 2007 world wide mobile subscribers will reach over 2 billion and almost half of it will be located in Eastern Asia. The second big market will be Europe with almost 400 million users. Analysts also agrees that the most common technology will also be GSM. WCDMA is estimated to have 27 million subscribers, whereas CDMA will have 422 million subscribers.

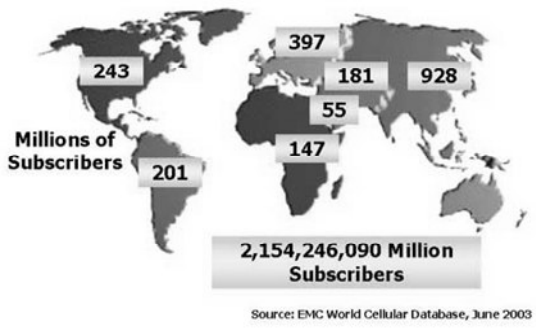
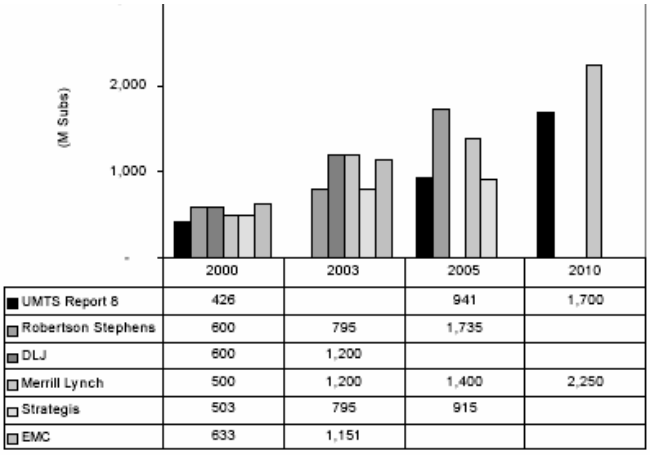


Figure 3-66 Global Subscriber Forecast by World Region 2007 (EMC, 2003)

According to UMTS Forum's Structuring the Service Revenue Opportunities Report analysts from various institutions have their own individual estimates about worldwide mobile subscribers.



	2000	2003	2005	2010
UMTS Report 8	426		941	1,700
Robertson Stephens	600	795	1,735	
DLJ	600	1,200		
Merrill Lynch	500	1,200	1,400	2,250
Strategis	503	795	915	
EMC	633	1,151		

Figure 3-67 Worldwide Mobil Subscribers Estimation (UMTS Forum, 2000)

Analysis also shows that number of global analog subscribers will decrease significantly over next four years.

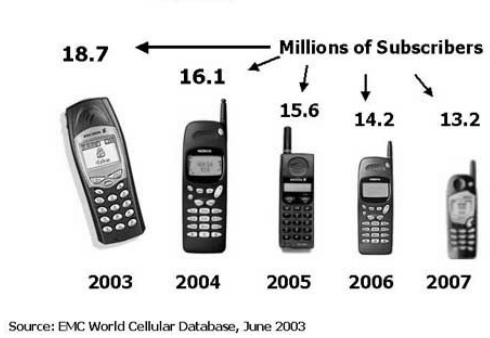


Figure 3-68 Global Analog Subscriber Forecast (EMC, 2003)

According to UMTS Forum, worldwide 3G subscribers will increase significantly in a decade after the start of the implementation. Please note that UMTS Forum has prepared this graphic given below and other all graphics normally before the delay in 3G implementations. Therefore all Telecompetition and UMTS analysis graph should be rescheduled one year after to be able to be consistent with current developments.

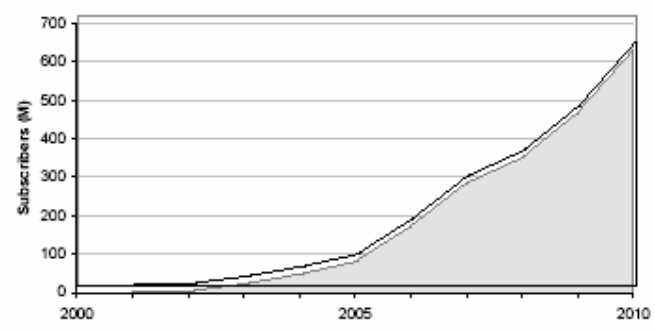


Figure 3-69 Worldwide 3G Subscribers (UMTS Forum, 2000)

UMTS Forum also suggests that by 2010 (2011) 3G service revenues will have an important share in over all communication revenues.

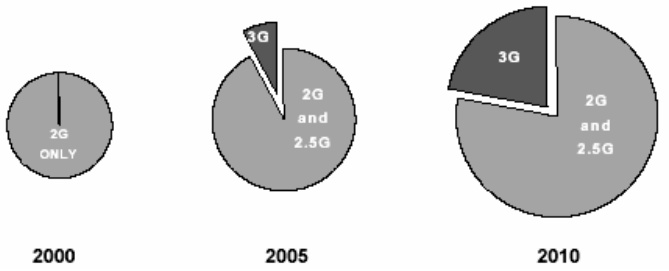


Figure 3-70 Worldwide Mobile Revenue 2G - 2.5G - 3G (UMTS Forum, 2000)

In fact many analysts in the industry uses UMTS Forums Report 9 and 13 and its alliance report which is Telecompetition's 2001 report on 3G services. Three of these report's results should be rescheduled one to two year to the future (2000-2010 vs. 2002-2012) to be able to be more consistent with the actual estimations. Because recent delays in 3G deployments and late introduce of 3G services created a need for the rescheduling and update of forecasts.

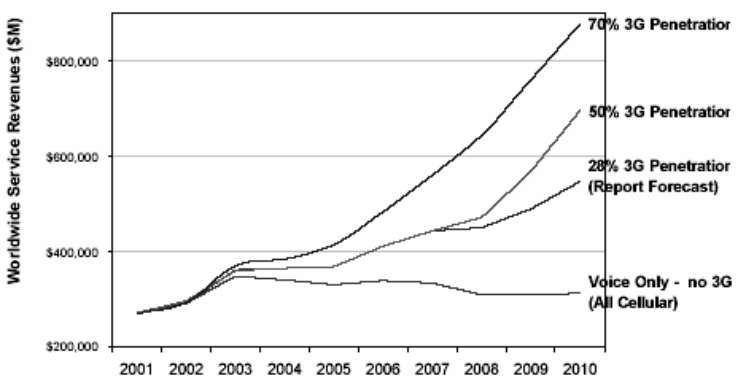


Figure 3-71 3G Deployment Scenario Analysis (UMTS Forum, 2000)

Above a scenario based approach parameters is given in terms of market penetration of 3G services. UMTS Forum prepared its revenue estimations according to this selected scenario (report forecast) which assumes 28% market penetration.

Since 3G limit the maximum data rate to 2 Mbps in indoor communications and less than 1 Mbps in outdoor communications. Both network capacity and transmission capacity per user in 3G systems need to be increased substantially in order to allow video applications to become widely used. As data rates supported by 4G systems should reach 100 Mbps, price per bit should drop by at least a factor of 100. (Cam and Lu, 2003)

British consultant BWCS has forecasted that there will be 114,220 wireless hotspots globally in 2006, up from 6300 in 2001. They foresee 17 million W-LAN hotspot users by 2006, generating annual revenues of some US$7.3 billion. However, it should firstly be kept in mind that these services are only accessible via enabled PDAs and laptop PCs. Secondly, since coverage is limited these services are not a direct competitor to 2.5G and 3G services. (Preeza and Pistoriusb, 2002)

Deutche Bank's research report's figure given below, shows that consumers are willing to spend 50% or more above their current spending to purchase new wireless services.

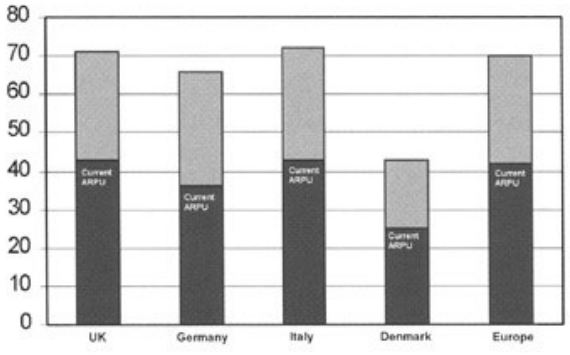


Figure 3-72 Expected Increase in ARPU with New Wireless Services (Deutche Bank, 2001)

According to Forrester research, wireless mobile operators will face to a significant decrease in ARPU.

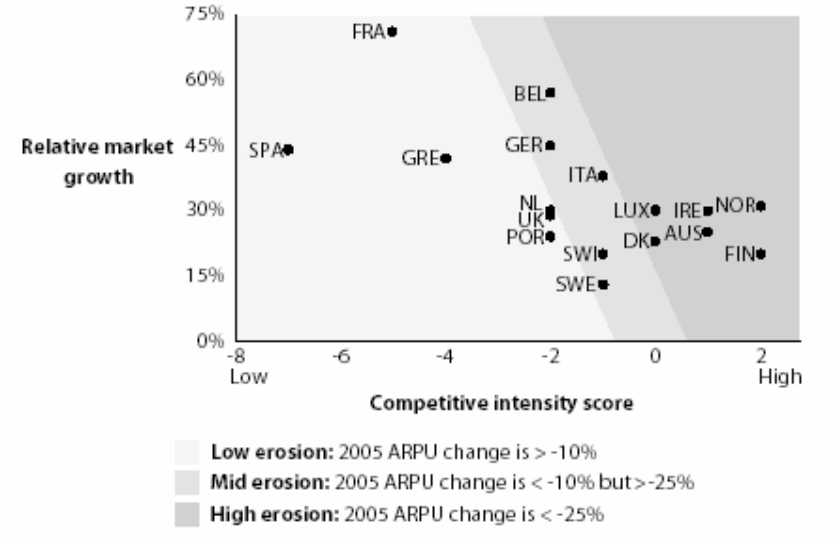


Figure 3-73 Segmenting Countries by ARPU Decline

Forrester believes that, price competition will cut traditional revenues by 36%. By 2004, Voice, SMS messaging, and data connections for faxes and laptops drive operator revenues. However, Forrester expects rates for all three to decline rapidly in the face of increased competition. As mobile virtual network operators (MVNOs), unconventional resellers, and new UMTS entrants enter over the next five years, they will use voice as a loss-leader to steal faster growing mobile internet users from existing operators. This rationality will lead to collective irrationality and decrease the traditional revenues. As a result, voice revenues will have 44% decrease while voice minutes per subscriber will rise from 121 minutes per month to 171. Moreover messaging will rise and then fall. Only

traditional data revenues are expected to grow by Forrester. Revenues from fax and Internet access from laptops will rise from 2% of ARPU in 2000 to 5% in 2005. Volume will grow by 700%. Furthermore mobile Internet access and usage revenues will explode from just over €1 in 2000 to €73 in 2005, making up 17% of ARPU. Besides, location data revenues will add up. Unfortunately in Europe all these told, mobile Internet revenues will total €106 annually, only 60% of traditional revenue decrease, and will leave a €69 ARPU short. Forrester Research analyst, Lars Godell believes that, The mobile Internet won't pay for UMTS investments. A 15% drop in average revenue per user by 2005 will destroy profits, unleashing major business failures and industry consolidation. According to him, operators will see: content revenues remain limited, mobile retail revenues will fall far short of expectations and advertising revenues remain almost nothing. (Godell, 2000) On the other hand in the same report the operators are declaring that they are going to deploy 3G services because their customer portfolio will expect them to do and if they do not do the customers will switch to the competitors. This pessimistic scenario is not the only scenario. As the merge and acquisitions will happen in the industry some analysts believes that the UMTS will create a lot of profit in the long run.

3.3.2.3 3G licenses

As 3G licenses were first introduced in the auctions, operators competed to get this advantage with very optimistic approaches. However especially huge investment costs delay of new technology deployments and the updated revenue estimations showed the license were costing too much and would be a constraint for the profitability at the end.

In common value auctions where bidders are naive and have less than perfect information, the winning (naive) bidders will have been those who made the largest positive error in their estimate of the value of the license. As a result, the high bidders may collectively suffer from ''winner's curse'' due to inadequate profit that is significantly lower than the winning bid (Scanlan, 2001; Norm, 2000). This has happened in the 3G licence auction of the UK and Germany. The overbidding increased new debt significantly, which in turn led to dramatic decline of the inflated stock market, particularly the stock of the bidders. The bankers lost their interests in lending their money to these crazy auction parties, as they did not see fundamentals in the trade. To a certain extent, the 3G auction in some countries acted as a catalyst that has led to the burst of telecommunications bubbles (Yan, 2004).

Because of the high profile disposals of licenses in some European countries, regulators are claiming collusion in auctions and the industry is claiming that beauty parades are preferable, that auctions are placing too great a financial strain on their business and financial markets (Jabbour and Redding, 2001)

Over the years, a huge amount of capital was invested in the telecom industry, resulting in too many companies producing too many products. The telecom network became overbuilt, and bandwidth was oversupplied, and it is a key economic principle that more supply than demand will inevitably cause fierce price competition. The narrow or even negative profit margin dampened capital spending among telecom service providers. Decreased spending created a downward spiral effect on the telecommunication industry for both service providers and manufacturers. In this section, we summarize various business draggers that have caused the industry downturn (Cheng and Tsyu and Yu, 2003):

- 3G license auctions;
- uncertain 3G profitability;
- network over-build and brutal price competition;
- heavy debt among telecom startups and dot.coms;
- bad loans by telecom vendors;
- second-hand equipment;
- B2C and B2B investment spending cuts

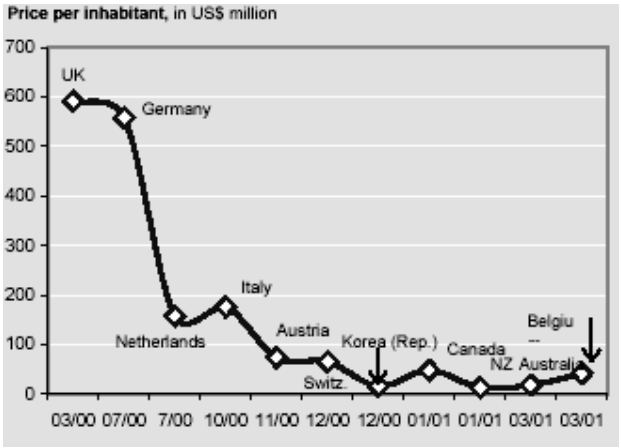


Figure 3-74 Decrease of 3G License Costs per Inhabitant (ITU, 2001)

Country	UMTS licenses	Allocation method	Allocation date	Total license cost (in billions)	License cost per capita
Countries with completed allocation					
Austria	6	Auction	Nov. '00	€0.7	€85
Germany	6	Auction	Aug. '00	€50.5	€611
Italy	5	Auction	Oct. '00	€12.2	€213
Netherlands	5	Auction	Jul. '00	€2.7	€169
UK	5	Auction	Apr. '00	€36.8	€630
Finland	4	Beauty contest	Mar. '99	€0.0	€1
Norway	4	Beauty contest	Nov. '00	€0.2	€40
Spain	4	Beauty contest	Mar. '00	€0.5	€13
Total	**39**			**€104**	
Countries with price set but licenses not allocated					
France	4	Beauty contest	TBA* '01	€19.8	€335
Portugal	4	Beauty contest	TBA* '00	€0.4	€41
Sweden	4	Beauty contest	Dec. '00	€0.0	€0.0
Total	**12**			**€20**	

Figure 3-75 3G License Costs in Europe by 2000 (Godell, 2000)

In the majority of countries, licencing has been and is done by way of an auction and, in some cases, staggering amounts have been spent on acquiring licences. Deutche Telekom, France Telecom, Vodafone, Spain's Telefonica and others have spent more than $95 billion on 3G licenses by 2002 and will need to invest another $125 billion on technology infrastructure (Preeza and Pistoriusb, 2002).

That's why license costs decreased substantially in succeeding auctions and in some cases it turned in to a beauty contest where the solution which will be delivered to end users is much more important then the highest bid for the auctions.

It is still not clear what the return will be for 3G licensees on the capital invested, and nobody has yet worked out what the hyped 'killer applications' will be. This is compounded by the fact that manufacturers are not delivering the equipment needed for 3G at the 'speed of light', as expected. Therefore, the licensees' represents reluctance to commit to specific dates in terms of delivering their services. (Kennedy and Salter, 2002). For example given the time to market and allowing for a year or two to deploy the 3G networks and to write the applications, we may be looking at 2007 before a full-blown commercial service is available in China. Another rumour has it that some people in Ministry of Information Industry in China, MII are even thinking about jumping straight to 4G in stead of applying 3G. (McGinty and Da Bona ,2004)

By mid 2003, almost 120 licenses have been awarded to operators worldwide for the use of IMT-2000 spectrum to offer 3G mobile services and almost all of them (except two) will use UMTS/WCDMA technology. With all new licensees additional capacity is provided to support greater numbers of users and new services. Regulators worldwide decided on harmonized spectrum, and while the UMTS/WCDMA licensing process is effectively complete in some parts of the world, for example in Europe, other regions are to give licenses. In North America UMTS/WCDMA deployment is scheduled in existing spectrum. US legislation is underway to utilize new 3G spectrum (1710 – 1755/2110 – 2170 MHz), giving the opportunity for the US to align with globally. It is anticipated that this activity will be completed by 2004, enabling American markets to select UMTS/WCDMA technology and harmonize their 3G deployments with the rest of the world.

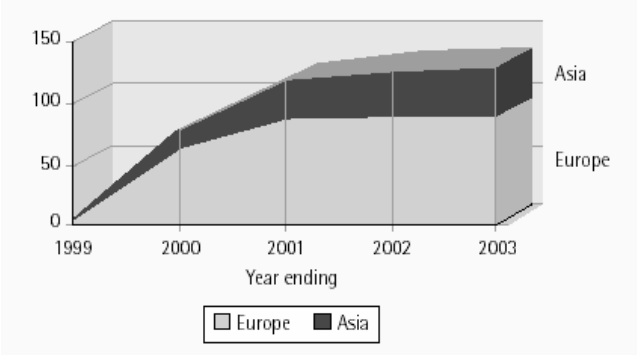


Figure 3-76 3G Licenses Worldwide (UMTS Forum, 2003)

3G operators may need to have alliances and partners to become globally available in terms of applications and to be able to provide more competitive applications. In both cases the concerns is if the alliances are good or not for the company. According to McKinsey Quarterly, especially cross border alliances have positive effect on stock market value of the trading shares of the alliance partners. 75 percent of the e-alliances intended to promote geographic expansion created value on announcement.

Figure 3-77 Effect of Cross Border eAlliances (McKinsey, 2001)

In especially fast-moving, highly uncertain industries, the market tends to prefer alliances to merger and acquisitions. Of the sample's 75 electronics and software companies that made significant alliance announcements, 64 percent were winners, compared with just 33 percent of acquirers involved in merger and acquisition transactions in this industry sector. eAlliances are now more essential than ever. Speed and scale remain important in the economy, and alliances are often a faster and less capital-intensive way to gain access to products, customers, and business capabilities than building them from scratch. NTT DoCoMO declares that its service i-mode has 39 million subscribers by the end of 2003 and it also suggests that this success also depends on their wide partner and alliance base

which is consists of 70,000 partner companies that provides content to i-mode.

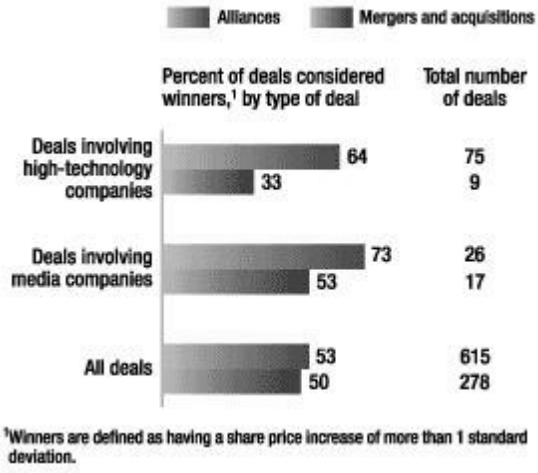


Figure 3-78 Alliance or Acquisition (McKinsey, 2000)

Regulating bodies are also possessing new regulations to position market in a more competitive dimension. One of the most famous regulation was happened in US against AT&T with $155 billion in assets, 144 million telephones through its subsidiaries. This antitrust action lead the creation of 22 Bell operating companies (BOCs) organized into seven regional Bell holding companies, commonly referred to as regional Bell operating companies (RBOCs). The purpose of this divestiture was to separate the increasingly competitive long distance market from the local services market, where incumbent telephone companies faced no competition. On the other hand European union has introduced a different limitation to improve the competition and prevent the anti trust. According to this approach a telecom operators are not permitted to own more then one network infrastructure.

Government may also introduce new safety and permission marketing standards that limits the marketing and service capabilities of 3G services. (Crichard, 2003) According to the new directives in UK, where unsolicited direct marketing is made to individuals, whether by fax, email, SMS or using automated calling systems, the consent of the recipient must first be obtained. (Crichard, 2003)

3.3.2.4 Services

According to research results of Dr. Elizabeth Fife from University of Southern California, widespread broadband deployment for wireless networks will be mostly by 2005 and later.

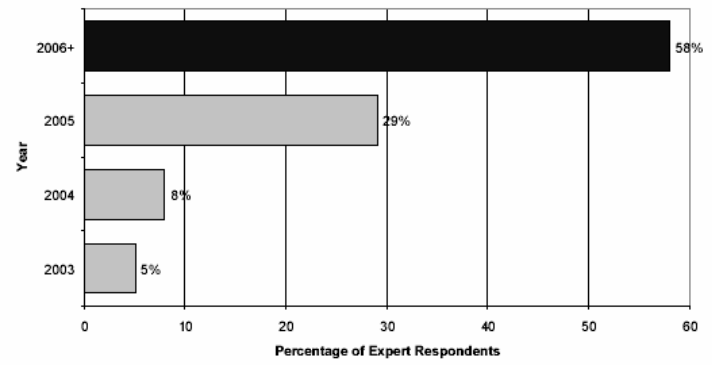


Figure 3-79 Widespread Deployment of Broadband (over 144 kbps) Wireless Networks by Year (Fife, 2003)

According to same research, business customers are likely to use wireless capabilities for messaging and especially for sales force automation purposes. Her research shows that this messaging purpose also increases the wireless internet access session times as it includes email access.

General Packet Radio Service (GPRS) and Universal Mobile Telecommunications System (UMTS) are forecasted to trigger an explosion in wireless data services over the next 5 years (Preeza and Pistorius, 2002)

Another fact is recent advances in video compression technology have made it possible to transmit real time video over low bit rate links. (Curcio and Lappalainen and Mostafa, 2001) Furthermore Third Generation Partnership Project 3GPP has finalized the standardization of the terminals for circuit-switched multimedia video telephony over 3G mobile networks. Which leads the enhancement in the improvement of speed of application for multimedia video telephony globally, as network and handheld devices will have a clearer strategy for their direction.

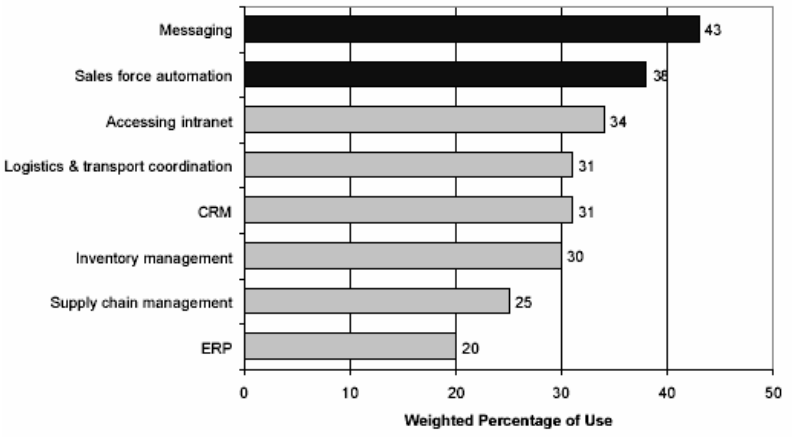


Figure 3-80 Projected Use of Wireless Activities for Corporate Activities by 2005 (Fife, 2003)

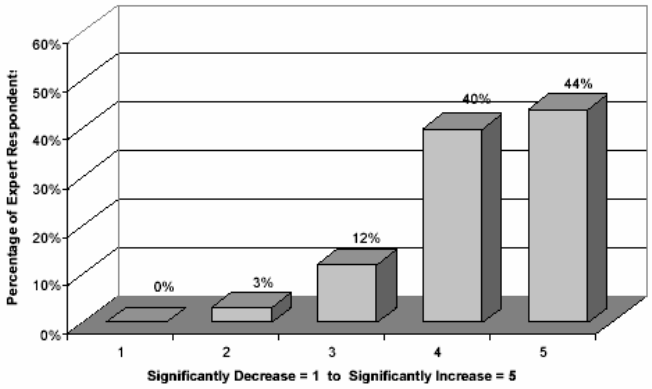


Figure 3-81 The Effect of E-Mail Access on Wireless Internet Session Times (Fife, 2003)

Researches show that business customers are focused on three main drivers which are security, reliability and cost savings while deciding to use wireless applications. If the operators will be able to manage these drivers effectively, they may succeed significantly.

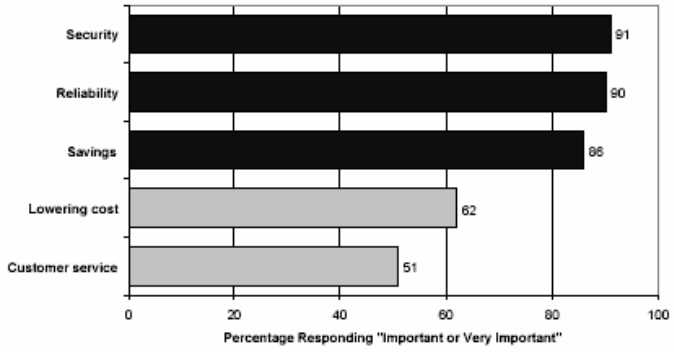


Figure 3-82 Factors Important in Increasing the Use of Wireless Applications for Corporate Clients (Fife, 2003)

UMTS Forum suggest that all 3G subscribers will not use all services and will be interested in a sub portfolio which handles their business requirements. According to given figure below, UMTS Forum suggests that almost all subscribers will use simple voice services in their handheld devices, whereas only half of the users will be subscribed to infotainment services, other service categories will receive rather low penetration.

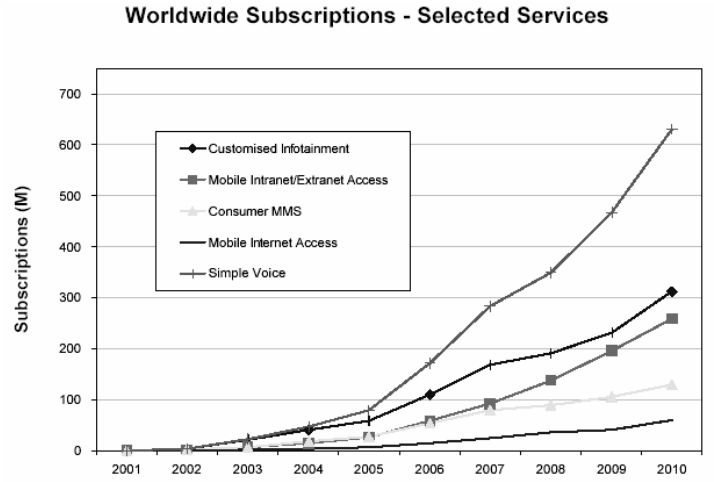


Figure 3-83 Worldwide Subscriptions to Service Categories (UMTS Forum, 2000)

As a result the major shares of overall revenues in world wide will be provided by simple vice and customized infotainment according to the scenario given in Figure 3-71 3G Deployment Scenario Analysis (UMTS Forum, 2000).

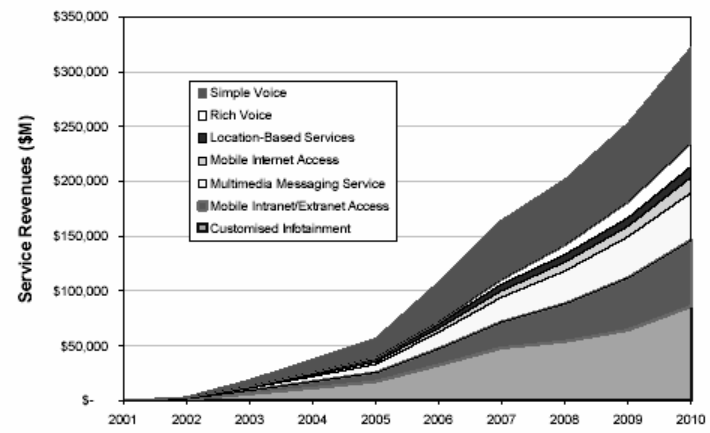
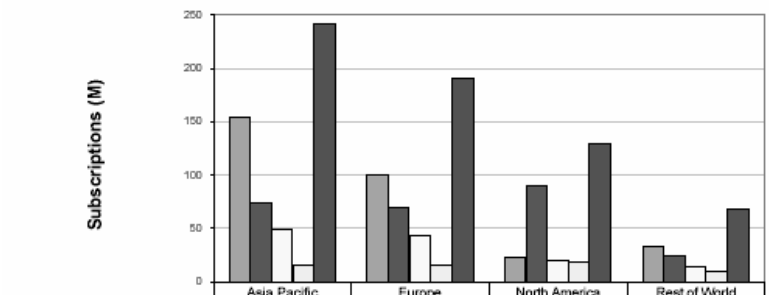


Figure 3-84 Worldwide Revenues According to Service Categories (Telecompetition Inc., 2001)

Analysts also distributed these revenue expectations in regions. In all regions but North America, revenue distribution among the services, are expected to be similar. In North

America the expected mobile intranet and extranet service revenues are expected to be the second biggest share among the service categories.



	Asia Pacific	Europe	North America	Rest of World
Customised Infotainment	155.0	100.2	22.6	33.6
Mobile Intranet/Extranet Access	74.3	69.7	89.1	25.1
Consumer MMS	49.5	43.9	20.7	14.5
Mobile Internet Access	16.2	16.0	18.0	10.0
Simple Voice	241.7	189.9	129.7	68.5

Figure 3-85 Subscription Comparison by Service by Region in 2010 (UMTS Forum, 2000)

Below, the graphic shows that North America is not demanding on customized infotainment whereas it is an important service revenue category for other regions. Another difference related with North America is the higher revenue expectation proportion from rich voice communications.

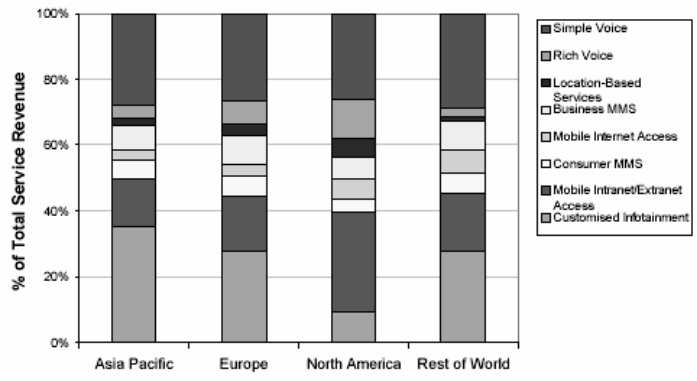


Figure 3-86 3G Services Revenue Composition by Region in 2010 (Telecompetition Inc., 2001)

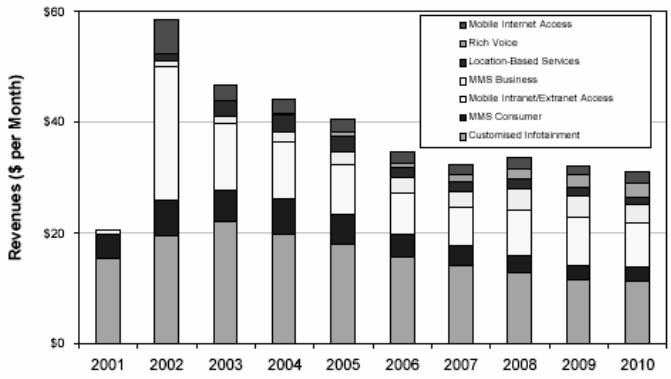


Figure 3-87 Incremental revenue per 3G Subscriber by Service (except simple voice) (UMTS Forum, 2000)

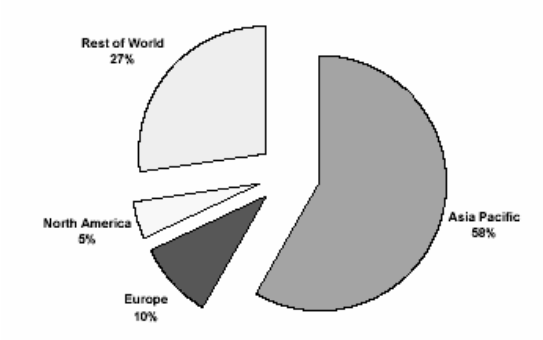


Figure 3-88 Worldwide Population Forecast by 2010 (Telecompetition Inc., 2001)

As considering the population expectations and the number of expected subscribers in each region, figures show that in fact the Asia pacific will be very diversified between highly penetrated markets such as Japan and Korea and low penetrated markets. However Europe and North America will have high penetration rates overall. Analysis also suggest that, consumer based services will dominate 3G services revenues.

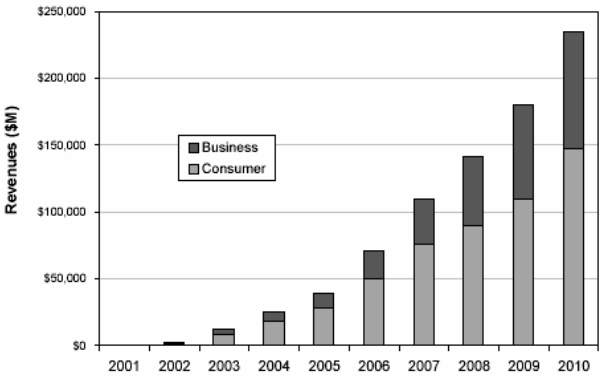


Figure 3-89 Worldwide 3G Revenues Consumer vs. Business (UMTS Forum, 2000)

3.3.3 CRM Market

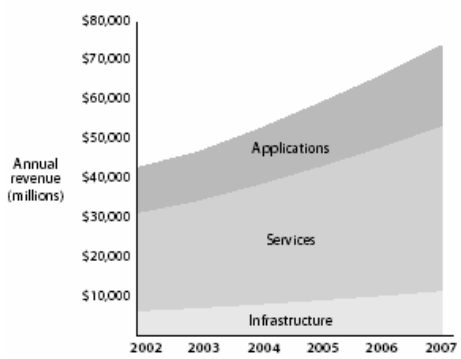


Figure 3-90 Market Review of CRM Integrators & Applications (Forrester Research, 2002)

According to Forrester research findings CRM market will continue to grow up till 2007. While infrastructures such as data integration, contact center infrastructure will represent steady increase trend, applications such as marketing automation, CRM suites, analytics, customer channel applications, field force automation and services such as contact center outsourcing, consulting, marketing services will show a exponential growth, while the services will secure their majority share. Analytical tools are expected to have a 11.7% CAGR where, marketing automation software are expected to have 16.9% CAGR. Analysts suggests that, in spite of the fact that many companies has suffered with unsuccessful results of their CRM implementations, firms will extract value from their CRM investments by evolving through three phases of maturity.

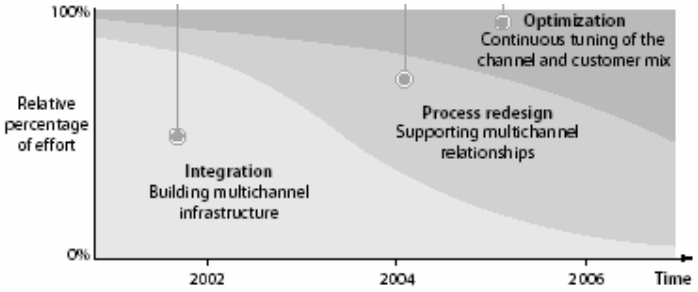


Figure 3-91 Evolution of CRM Activity in Global Firms (Forrester Research, 2002)

- Integration: Forty-four percent of online shoppers use two or more channels; 79% of financial transactors are multichannel (Forrester Report, 2002). Companies, which implemented CRM, still struggle with cleaning and synchronizing data and leading consumers to the best channel for a transaction: Many firms can't provide basic capabilities like central change of address or help with online transactions

from their call centers. That's why firms start their CRM journey by cleaning up data across both online and offline channels.

- Process Redesign: With the basic interaction infrastructure in place, firms face another task, changing employee and customer behavior to match revised business rules and process flows.
- Optimization: Firms that reach the third phase will view their businesses as a constantly updated portfolio of services and customers.

Gartner classifies CRM implementation expenses in four main expense groups, which are hardware, internal services, external services and software. Gartner suggest that the highest resource usage in terms of expense is with internal services.

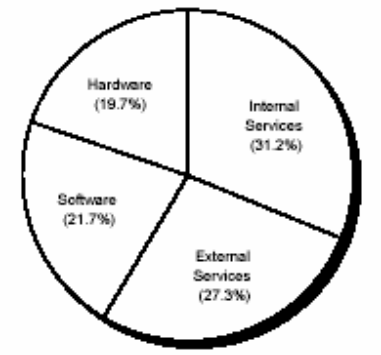


Figure 3-92 Mean Average CRM Spending by Component (Gartner, 2001)

According to Michael Matthews, Amdocs Chief Marketing Officer, many large-scale service businesses need to deal with millions of customer relationships that are multifaceted and complex which involves selling, configuring and delivering services, billing, customer service and up selling. However as Forrester Research suggests that, every system-to-system connection can cost $250,000 or more, integration capability is becoming very important in terms of total cost of CRM implementations.

Gartner also reports that, according to their forecasts, communications is expected to be the second largest market for CRM with annual compounded growth rate of 19.6%.

Table 3-9 U.S. Vertical Market CRM Solutions Forecast, 2000-2005 (Millions of Dollars) (Gartner, 2001)

Vertical Market	2000	2001	2002	2003	2004	2005	CAGR (%) 2000-2005
Communications	1,953	2,118	2,541	3,218	3,890	4,780	19.6
Education	280	330	390	432	500	580	16.0
Financial Services	6,226	7,160	8,377	10,136	12,366	14,963	19.2
State and Local Government	300	390	507	659	857	1,114	30.0
Healthcare	435	485	704	808	898	997	18.0
Manufacturing	1,848	2,139	2,462	2,853	3,347	3,970	16.5
Retail	835	1,096	1,302	1,583	1,981	2,500	24.5

According to Forrester research, telecom operators are focusing on customer retention and customer development while implementing CRM systems. According to research firm The Aberdeen Group, mobile customer churn has risen to 25 percent annually. Moreover, Cellular Telecom Industry Association suggests that average customer acquisition costs for such providers range from $250 to $300 per new customer. According to Harel Kodesh, Chief Product Officer of Amdocs, mobile operators will spend at least $1.3 billion to replace existing customers in the coming year. As it is shown that the churn is a big cost for mobile operators, operators are concentrating on customer loyalty and retention to stay profitable.

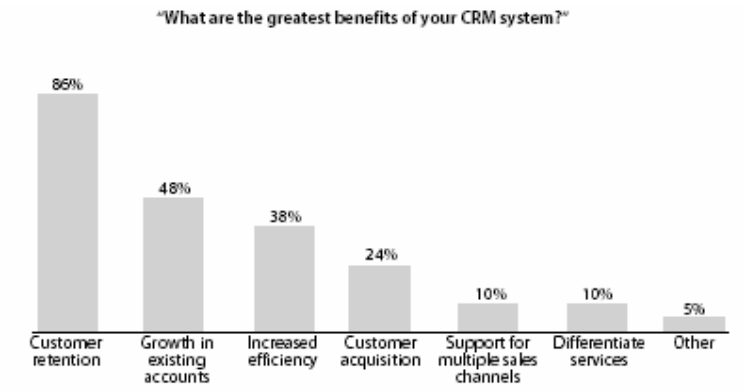


Figure 3-93 Benefits of the CRM systems for Telecom Operators (21 Operator) (Seema Williams, 2001)

According to the Gartner, 2003, with approximately 19,200 seats deployed to internal users on a CRM, a company has figured out dramatic results, which include cost reductions of $15 million in systems decommissioning, and $21.6 million in service-reduction savings, along with $226 million in service revenue driven through entitlements, and improved customer service with 95 percent of calls answered within 20 seconds.

According to Telecom Operators CRM enables better customer experience and data collection methodologies for analysis.

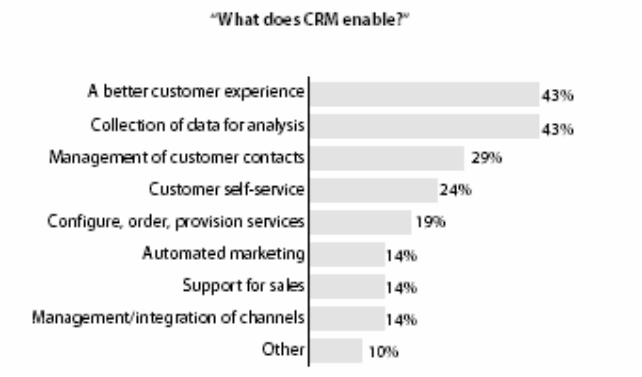


Figure 3-94 CRM Activities in Telecom Operators (Seema Williams, 2001)

As a result telecom operations and CRM market will grow up and enhance substantially. In spite of the fact that there might be a severe struggle after the implementation of 3G services because of the overcapacity and huge capital investment, good CRM support may leverage company and become an opportunity to survive from the meltdown effect.

4 CONCEPTUAL MODEL

4.1 Business model framework

Reviewing the models and services, discussed in section 3.2.4; this thesis proposes to describe 3G market business models with the five layer frame work which has been developed as reviewing and combining these proposed models in a logical structure as given below.

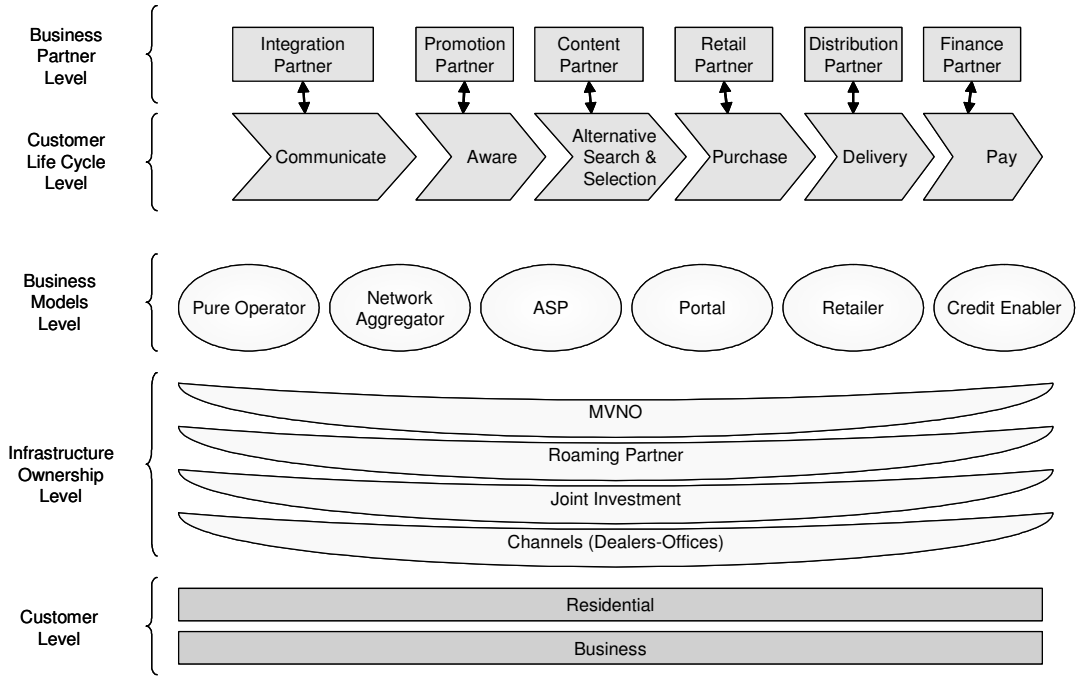


Figure 4-1 Business Model Framework

Mainly the business model level of this frame work is very similar to the classification, which is defined by Accenture. However it has slight differences with its layering structure and the classification capabilities in terms of their offerings to their customers. The layer structure defines five layers, at the bottom line the end user is defined as the ultimate receiver of the services and the target market.

Second layer is the infrastructure ownership layer which also defines the way of delivering and aligning the capabilities to the customer. Because customer interactions, also depends on ownership of the transportation infrastructure. This infrastructure basically defines four different dimensions. The first one is the ownership of the physical channels. By 2004 communication companies are not only selling bandwidth. Handset sales are important

revenue item for communication companies. It is also strength for dealer in terms of profitability. In the future as the range of services and products enlarge, dealers may provide a delivery point role for some of the items. Mobile data will gain much more importance in the future, on the other hand mobility of the users are not limited with in urban are, city, province or country. That's why many operators are now looking for globalization of their services over the world. Normally the big telecom players are first focusing on the countries where their customers are frequently visiting and they try to invest in these countries. NTT DoCoMo has a vision of globalization and investing in many European countries to globalize its services. The other basic ways of getting globalization is improving partnerships and roaming agreements with the local telecom companies. MVNO's as described above are the wildcards of mobile industry. They are focusing on value added services and brand image to enter in the market, and they may be very successful as 3rd Generation communications promises various value added services and an open era to be creative. On the other hand their business processes will require extreme integration with their infrastructure supplier. That will be also a good investment opportunity for the infrastructure provider because they will be able to utilize their network costs with less level of marketing efforts. On the other hand MVNOs will carry the risk of disqualified services. They may try to secure them selves with SLAs but their brand image, their main asset, may harm badly with recurring failures.

Another main layer of the five layer frame work is customer life cycle layer. This layer is used to map the applications and their supporting services of the mobile operator. Mobile operator may want to cover all of the life cycle or may cover it partially. In both cases mobile operator will need to have alliance with supporting partners to cover the rest of the life cycle which is applicable to the related application. For example a mobile operator may provide content to its subscribers as either creating the content by it self or aggregating it as receiving from other content providers. Also a mobile operator may enable its subscribers to buy goods from cell phones. Then the delivery of these goods can be either done by operator's distribution organization or a third party. Moreover according to the payment method, operator may be involved in the payment process, and secure the environment for the parties, or actually do the payment as behaving like a mobile credit company. The creation of promotion coupons with location based advertisement, providing a secure network system for a business, providing network connection for home appliances

(telematics), or providing business application hosting for corporate and its employees are other example where the level of integration of the mobile operator defines the need for third parties within the process.

As partnership layer has also discussed in defining the customer lifecycle layer, the last layer to be defined is the core of the framework which consists of six business models.

- Pure operator layer is describing the business model which covers basic services, such as voice, messaging, video phone, conferencing, location, web based services and data.
- Network aggregator is the providing secure network structures for the corporations and subscribers. VPN and intranet are most common capabilities of this model. This business model will also enable subscribers to reach their home networks and manage the appliances, ovens, refrigerators, lights, door lock at the home.
- Application service providers. As communication companies are hosting many information systems and they are literally on the backbone, they may choose to provide ASP services, as hosting and managing the application for mobile interconnectivity.
- Portals have already been implemented despite of the low bandwidth of 2nd Generation mobile networks. Portals need content and this content may either be created by mobile operator or can be retrieved from the content partners.
- Retailer model simply covers the ebusiness processes. It may be very successful if the required integration and creativity would perform. Computers are not personalized but the cell phone is and it is mobile.
- UMTS phones have cards inside the handsets, which is similar to the GSM SIM cards. These cards will identify the card owner as credit card or debit card identifies the card holder. This card also requires a PIN number to be activated and it is also linked to a billing account. While credit cards define their selves with credit card number, these cards have more then one number such as card number and phone number. Credit cards also need to communicate with banks using POS machines when a purchase is done. Cell phones do not. They are already linked to their mobile operator and communicating. Credit Enabler model depends on the this

similarities between the credit card and cell phones and some of the enhancement in terms of security which credit cards do not have.

All these business models may support either consolidated billing or individual billing by the parties. It depends on the integration level of parties and their financial decisions.

4.2 CRM Five Driver Evaluation Frame Work

The evaluation of Impact of 3G on CRM in Telecommunications Industry is done within a multi level approach. This frame work identifies the drivers under 5 main classification, which are Strategy, process, organization, aesthetic and technology. There are also some differences according to the 6 main business models defined in Generic Business Model Framework (Figure 4-1 Business Model Framework). Which are, pure operator, network aggregator, ASP, portal, retailer and credit enabler.

CRM strategy will be considered to be derived by a combination of nine drivers in this thesis; which are mission of the organization, financial structure, six market structure, competition, partnership, branding, outsourcing, channel & distribution structure, service & product portfolio.

- Mission: Mission is the ultimate long term goal of the company, every strategy should be in conformance with the vision and mission of the company.
- Branding: Brand is one of the most valuable assets of many successful organizations. Brand also can be a good psychological influencer for buying decisions. That's why CRM strategy should not only be consists of a process and technology but it should also be able to communicate company's message to the customer.
- Outsourcing is always an option for the company. Outsourcing defines the fixed investment requirements as decreasing the costs of operations. However it also has its own risks which should be well managed.
- Financial Structure: Companies have responsibilities to its customers and employees as well as its share holders, regulating bodies and suppliers. Shareholder satisfaction is very important in the over all success of the company. Each strategy must be analyzed in terms of profitability, cost and cash flow. The success of implementations also depends on well budgeted plans.

- Channel and distribution: Companies may have different kinds of value chains which deliver their offers to the customer successfully. Channels are used to deliver these offers to the buyers. Level of channel integration improves the customer satisfaction and experience.
- Partnership: All companies requires alliances and partnership to gain strength in the market, with improvement of network systems more complex business structures are began to evolve. The selection of alliances, partners and the business model should be considered in terms of company profitability, company stock price volatility - behavior and customer requirements to implement profitable relationships.
- Competition: Competition is a major driver to be able to provide competitive advantage in the market, companies need to know their strengths and weaknesses comparing with their competitor. The competitors CRM challenges must be observed and lessons learned document should be prepared.
- Six market Structure: Referral, influence, customer, recruitment markets, supplier markets and internal markets shape the environment of the CRM structure.
- Service and product portfolio is one of the main constraints of the scope of CRM. Each service or product requires unique way of delivery in some aspect. They require different processes and different customer interaction needs.

As customer lives, CRM is also lives and evolve with his or her requests, these evolutions may lead need for substantial change and update in CRM Strategies. That's why CRM specialists should review the strategy regularly and should update the strategy if it is necessary.

For Processes, in this thesis in addition to the processes defined by telecommunications management forum in section 3.1.3.8.2; partner management, rating & discounting, service planning & development, field service (service problem management) and marketing processes will also be considered in terms of the 3G impact .

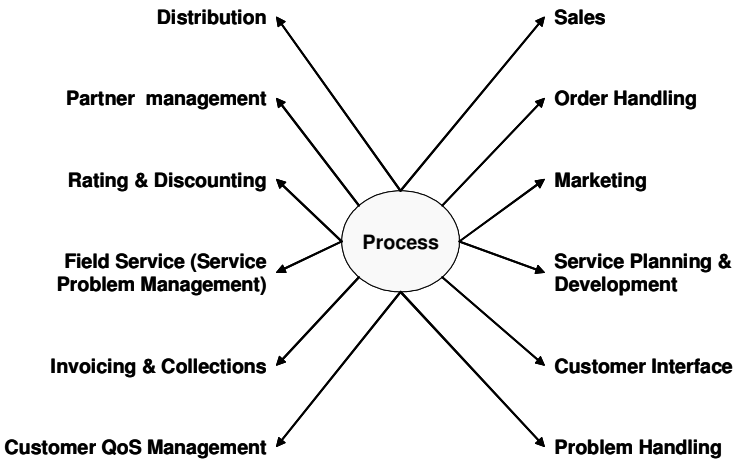
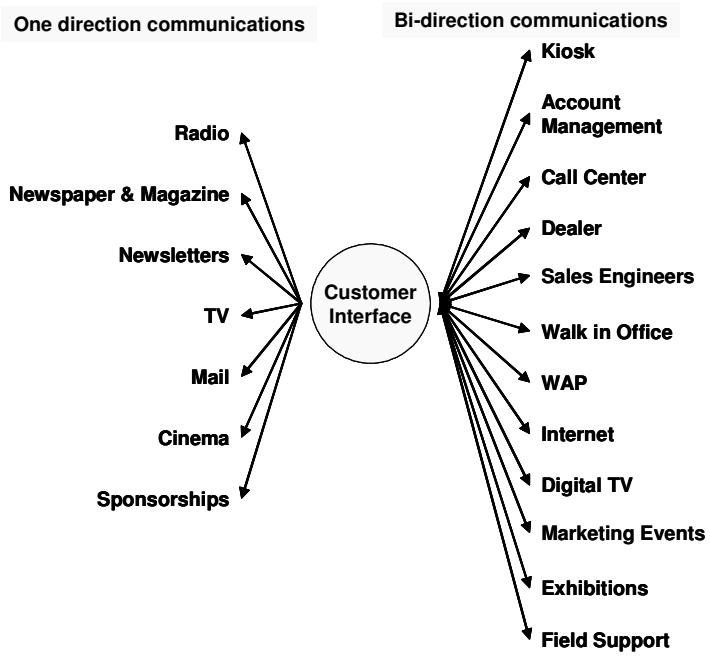


Figure 4-2 CRM Centric Process Classification

In this thesis the CRM channels are classified in to two different groups which are one way and two way communications. Since CRM is more listening then broadcasting, only bi directional communications covered in the document.



As it is shown in the figure, there are lots of channels and it is not easy to manage them in terms of process, technology and people. Because they are diversified in to their areas and their nature made them face to indifferent hurdles by time.

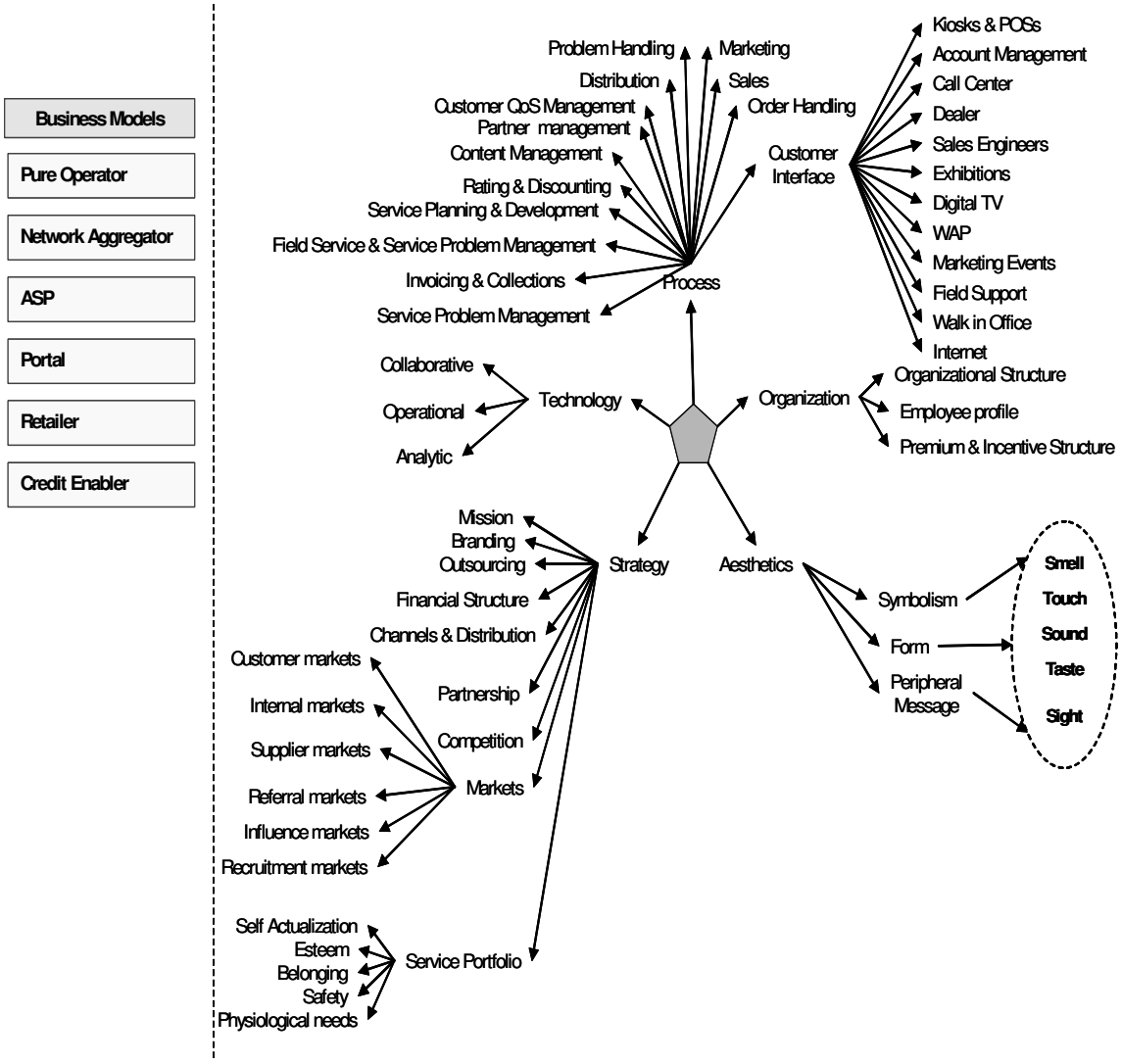


Figure 4-3 CRM Business Impact Evaluation Framework

As a result of our research and literature review we have developed a multi dimensional and hierarchical CRM driver framework which we have used to score and classify each of our findings. We believe this framework can be used in wireless telecom environment effectively. In general, most of the similar drivers have 3 components such as people, process and technology. However we have decided to identify strategy and aesthetics as other two main drivers. We have also defined the sub drivers of each of these main five drivers. We believe this model can be effectively applied to other industries with industry specific modifications.

5 FINDINGS

5.1 SWOT Analysis

Below a hypothetical SWOT classification is made for a 3G mobile operator to classify the opportunities and threats in the market and an anonymous 3G Mobile operator strength and weaknesses to over come.

Table 5-1 Strengths and Opportunities for 3G Operator - I

Strengths	Opportunities
• As markets and operators merge and market keeps growing up, economies of scale effect will increase profitability • Network investment cost will be lower per subscriber • Introducing more customized and personalized services will provide better marketing skills with the deployment of stronger analytical, collaborative and operational CRM tools. • Service quality will increase • Companies will seek for alliances and good alliances will become a major strength • Some operators will try to establish distribution networks to support their retail operations. Good distribution alliances will make them powerful • Large application portfolio will support loyalty.	• Market for 3G will grow rapidly in next ten years • Changing customer needs/tastes • Entering foreign markets with global service vision • New services will introduce brand new customers to wireless market • Governments regulations and deregulations decreases the barriers to get in the market • Telecom companies are seeking for alliances out of their domestic markets • Number portability regulation will increase churn rates and make it easy for brand switch • Demand for 2G and 2.5 G services will decrease substantially because of the image of new generation and its capabilities. • New distribution methods and cash flow methods will enable change in the value chain.

Table 5-2 Strengths and Opportunities for 3G Operator - II

Strengths	Opportunities
	• Because of the high profile disposals of licenses in some European Countries, regulators are claiming collusion in auctions and the industry is claiming that beauty parades are preferable, that auctions are placing too great a financial strain on their business and financial markets • The concept of situation dependency that applies features specific to mobile computing as ubiquity provides a leverage for the acceptance of new wireless applications

Table 5-3 Weaknesses and Threats for 3G Operators

Weaknesses	Threats
• Operators have been heavily investing and will continue invest. Also operator acquisitions may struggle cash flows and ROI in short terms. • Because of the high investment cost and recent experiences in the economy, investors would only invest very carefully. • A new 3G network and application platform implementations may require high capital costs. • Diversification of application and more complex business models will cause internal operating problems	• Foreign operators may go in the domestic markets to provide global service • Wireless LAN, Low Orbit Satellite, GPS, EDGE, 1X, GPRS and 4G services may substitute the services for some market segments. • If visual content will go for wider screens then the handheld devices will not be able to cope with customer demands for wide screens.

Table 5-4 and Threats for 3G Operators - II

Weaknesses	Threats
• New business capabilities and processes will require higher level of knowledge on systems and processes. Employees may need to trained. • Number of users, service providers and network operators; increased level of service interaction • As the number of relationships increases, by the number of users, service providers and network operators; increased level of service interaction increases the number of potential attackers and the opportunities open to them • The user interface on a mobile terminal is less comfortable and less convenient for the user to control and to interact with the applicable services	• Government may introduce new safety and permission marketing standards that limits the marketing and service capabilities of 3G services. • Economy is ramp up phase now but may down turn in the future • Lack of standardization, having more than one standard or lack of deregulations may prevent companies to enter in some regional markets. • Business regulation diversification between countries may not be supported by CRM and billing systems or business processes. • Lack of good alliance in regional markets may cause customer dissatisfaction.

5.2 Five Forces Analysis

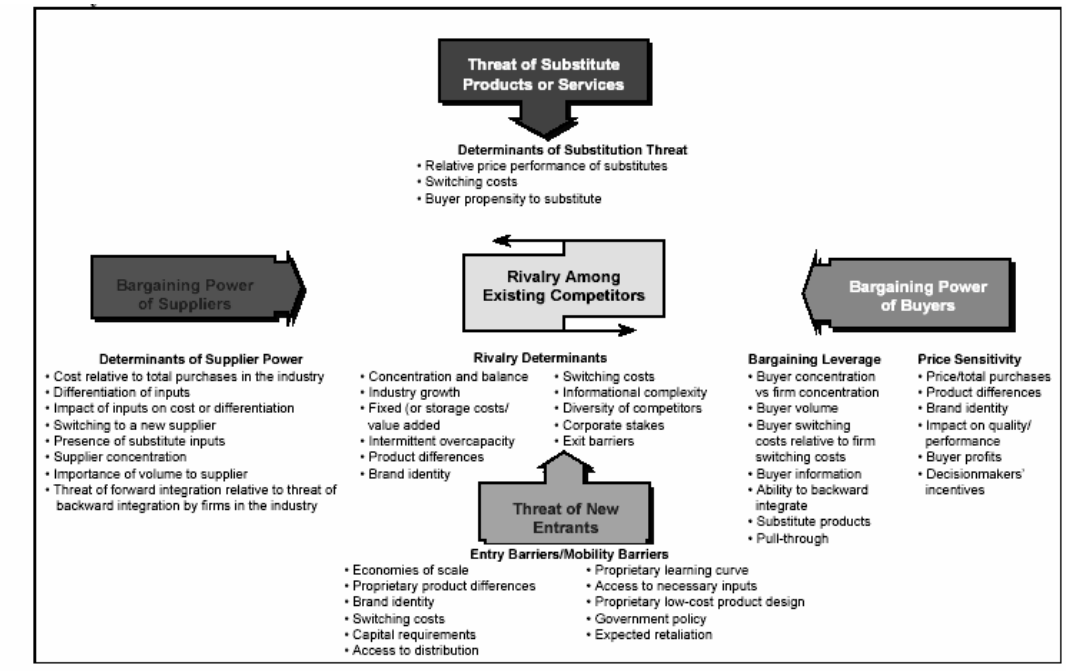


Figure 5-1 Porter's Five Forces Analysis (Porter, 1980)

5.2.1 Bargaining power of suppliers

5.2.1.1 Other telecom operators

- In international traffic because of the bandwidth abundance many countries are selling their extra capacities and they are offering competitive prices. But for roaming agreements normally the network supplier (operator) has more power.
- It is hard to dominate the integration standards to another operator.
- In almost every country there are more then one mobile operators.
- If there is not enough regulations to calculate cost and maximum profit margins, fixed line operator may sell transmission and mobile to fixed connections with high profit margins especially in monopolist regulated markets.
- Normally volume is so low for roaming partners.

5.2.1.2 Technology vendors

- Main infrastructure suppliers have normally 10% of the global market individually. A major Telco operator may order 2%-5% of total sales of one major vendor. In some cases investment is bigger.
- Because of integration problems switching between infrastructure vendors make telco companies to struggle in integration and management problems how ever in order to manage the risk operators may prefer to work with more then one vendor.
- Many suppliers have similar products with similar capabilities.
- As telecom volumes are very big, vendors do not want to loose the opportunity

5.2.1.3 Application partners

- For partner companies operators are normally big buyers and can dominate market easily.
- Operators can define their integration standards.
- Some applications can be exclusive to some unique partners but mostly there are switching alternatives.

- Telecom operators may have enormous volume in terms of local application partners.

5.2.2 Rivalry among existing competitors

- Industry will grow up rapidly from 0 to over 300 billion USD in 10 years.
- High capital investment is made
- In some regions there will be over capacity in terms of substitutes, and market players.
- Content, partner application portfolio and business models will differ among competitors.
- Brand identity will be a important asset especially for MVNOs. Customer base will be influenced by brand image.
- Switching cost is high, customer acquisition cost is $300 USD per subscriber, where as ARPU will be $20-$60 USD
- Competitors will be highly diversified in terms of specific needs of small segments utilizing wide range of offerings. They will act as many small companies with same brand image and culture.
- The huge investment cost will not pay it self short term. And it will not be easy to sell the un profitable operations which has small market share.
- General Packet Radio Service (GPRS) and Universal Mobile Telecommunications System (UMTS) are forecasted to trigger an explosion in wireless data services over the next 5 years. This data services increase will attract more entrants to the market and increase the competition between the existing competitors.
- The evolution of 3G-networks signifies a shift towards open and easily accessible network architectures, which raises major security concerns. Thus, all stakeholders are interested in the security level supported in 3G-systems because of the identified risk that prospective users might perceive 3G-networks as not trustworthy, and not use them. Therefore the operator who has better security level especially corporate data structure will gain substantial competitive advantage against other operators.

5.2.3 Threat of new entrants

- Low profitability will make market less attractive because of the emerging price competition
- Licensing will be a proprietary barrier. Without license new entrants will not be able to get in the market. On the other hand service and technology can easily be imitated if the entrant will be able to own the license.
- Switching cost is high, customer acquisition cost is $300 USD per subscriber, where as ARPU will be $20-$60 USD
- Huge investment is required for network owners. How ever MVNOs may easily start their operations as establishing only customer care, sales and marketing functions.
- New entrants can make good deals with suppliers as suppliers want to sell their products.
- For innovative services where operator works with vendors and communities to develop a new product or service, patent may be required but normally the technology is bought form the technology vendors.
- Governments are motivating competition in the market in deregulated markets. Governments also plan to regulate the privacy requirements for customers to ensure operator is not using more information that its business is related to. These privacy considerations may limit campaign preparations in terms of affectivity and process.
- Available handsets portfolio, customer support and care activities and exclusive applications will be differentiators.

5.2.4 Threat of substitutes

- Expected price performance ratio for substitutes will be high for 2G, 2.5 G, low orbit satellite systems. However the ratio may be lower for cable and PSTN applications and services.
- For 2G and 2.5G it may require change of handsets and less application availability. For PSTN and Cable an initial investment of modem and cabling will be required,

moreover these services will not enable mobility. Low orbit satellite services may be mobile but will have less content, require bigger hand sets and lead higher costs.

- Customers are already using the substitutes. Especially for 2G and 2.5G services if a buyer will switch to 3G then they will not turn back to the old generation normally. And 4G, which can be a substitute in the future, will be available after 2010. Satellite, cable and PSTN handle different needs, such as if customer requires high broadband for fixed communication medias such as TV and PC. These substitutes will be available and attracting for the customers. Since 3G limit the maximum data rate to 2 Mbps in indoor communications and less than 1 Mbps in outdoor communications. Both network capacity and transmission capacity per user in 3G systems need to be increased substantially in order to allow video applications to become widely used. As data rates supported by 4G systems should reach 100 Mbps, price per bit should drop by at least a factor of 100.
- A competing wireless technology is wireless LANs (W-LANs). Making use of technologies such as IEEE 802.11b/g and unlicensed frequencies in the 2.4 GHz band, a range of W-LAN operators is springing up and rolling out short-range, high speed data access points for business travelers in locations such as airports lounges, hotel lobbies and conference centers. While these networks cannot hope to match the coverage of wireless networks, they do offer download speeds of up to 11 Mbps. British consultant BWCS has forecasted that there will be 114,220 wireless hotspots globally in 2006, up from 6300 in 2001. They foresee 17 million W-LAN hotspot users by 2006, generating annual revenues of some US$7.3 billion. However, it should firstly be kept in mind that these services are only accessible via enabled PDAs and laptop PCs. Secondly, since coverage is limited these services are not a direct competitor to 2.5G and 3G services.

5.2.5 Bargaining power of buyers

5.2.5.1 Bargaining leverage

- ARPU is normally not very high and customers have their own behavior in terms of use of services, but normally any of the customers have a major demand share on services.

- Normally buyer do not has switching cost especially after number portability regulations. Competitors are also willing to pay for contract penalties if customer agrees to switch to their company. How ever operators have opportunity cost as new customer acquisition may cost $300 USD.
- Operators have detailed information about their existing customers. But not much about the customers which their competitors are working with. They use modeling techniques to predict some important information about the prospect customers.

5.2.5.2 Price sensitivity

- Telecom customers are accepted to be price sensitive
- Different applications refer to different prices and price plans.
- Brand identity is important and communicated by different channels in terms of customer care interactions.
- Customers are willing to pay more for some high quality applications and services. But normally technological innovation is referred as a better point.

5.3 Analysis of The Effect According to Five Driver Evaluation Framework

Below each driver effecting the CRM operations of the wireless operators are discussed in detail. The significant differences related with business models will also be summarized if it is needed. The results of research questionnaire will also be reported in this section.

Research questionnaire received fifty four responses from survey participants from North America, Europe and Asia. The profile of the participants is given below.

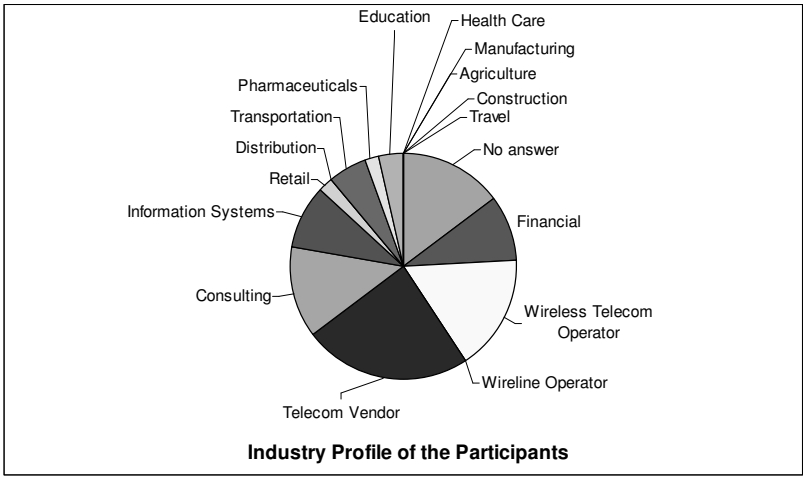


Figure 5-2 Research Questionnaire: Industry Profile of the Questionnaire Participants

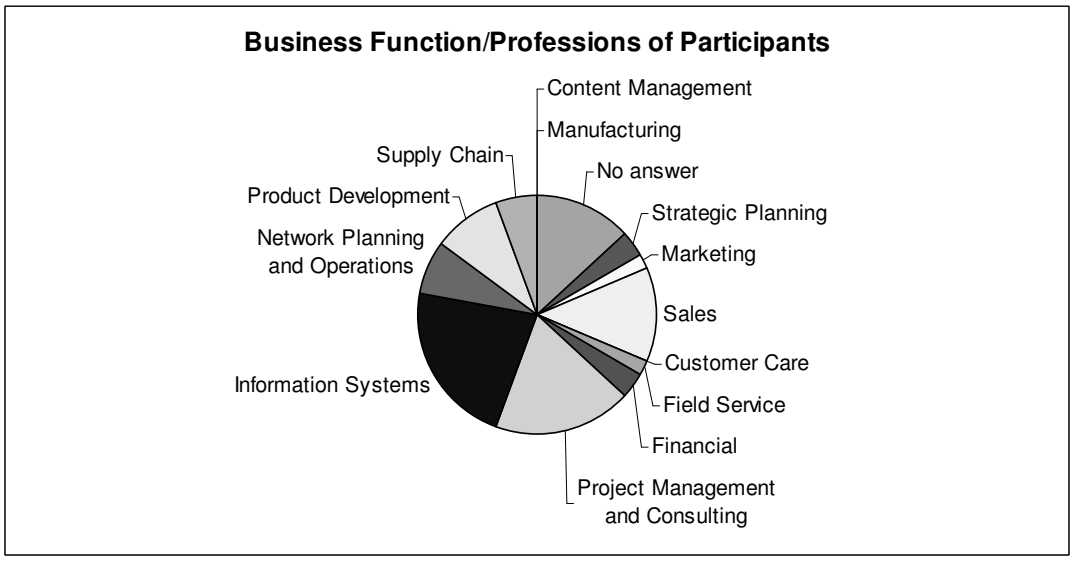


Figure 5-3 Research Questionnaire: Business Functions of the Questionnaire Participants

5.3.1 Strategy

The effect of strategy can be summarized as the effect of drivers which also create the business model. There are basically nine main drivers listed in terms of strategy, which are;

1. Mission
2. Branding
3. Outsourcing
4. Financial Structure

5. Channels & Distribution
6. Partnership
7. Competition
8. Markets
9. Service Portfolio

5.3.1.1 Mission

Companies' goals and business objectives must be in conformance with its vision and missions. These two words basically identify the reasons of existing for the company, other then making profit. As all decisions and programs must be aligned with these long term strategies, they are in fact the key player which defines the CRM strategy. As the evolution of wireless market with increasing number of applications and shifting from communication provider role to value provider role for clients, drives a substantial change in operators' missions and visions. In the future's wireless market operators will switch their sole network provider role and will look for some thing more then solution provider. This role will require understanding customer, listening customer and taking care of their mobile needs. Recently some operators started to enhance their mission statements and started to consider not only communications but on being mobile, not only person to person communications but with ubiquity they aim to cover person to machine and machine to machine communications. These missions will enable them to integrate in to new value chains as communicating with home appliances, with car or communities at the same way of interaction. But to do that, companies must switch their consideration on customer base from subscriber base. And they should be able to understand customer's needs even better then the customers them selves. "Our plan is to lead the public with new products rather than ask them what kind of products they want. The public does not know what is possible, but we do. So, … we try to create a market for a product by educating the public about what the product can do for them. " says, the CEO of Sony, Akiro Morita. As he sees that the creativity may lead the markets where innovation is unique. However as wireless operators will not create their own patented technology, then the competitors will be able to imitate easily. To survive operators must listen their customers and understand what kind of innovation they are in need of. Then operators will lead the market with the service and

product as it satisfies the certain need of the customer. These listening not only consider what, when and how customers do but also what and why they do not do. In other words as much as action behaviors, passive behaviors will teach the companies about what they are in need of.

5.3.1.2 Branding

Network, infrastructure, cost, functionality, customer care these are all important drivers to select an operator among others. However if the MVNOs will emerge and they will start to compete over same infrastructures, if companies starts to outsource same customer care services from same companies, if their pricing flexibility will be limited by competitors and costs, and if they imitate each other and provides similar applications of 3G services, then the differences will be fuzzy. They would need other drivers. Moreover even with the different level of service qualities, prizing and application of services portfolio the brand image will play a significant role. As 2G, 2.5 G, satellite, wireline, Wireless LAN and other services providers may try to take bigger share from the same cake, competition will require other psychological strengths such as image of innovation, responsiveness, community values and others. All CRM strategies should be aligned with brand image. Customers should feel the same image not only interaction with all channels but also receiving the promotional messages from the company. Also as the mission of the company evolves with a way that understanding and listening customers in all aspects and providing services not only for their personal communications but all of their mobility interactions, the brand image should also evolve with the new way of approaching to the customer. This new brand image should be able to identify the differences between the existing operator solutions and new multi interaction environment with various numbers of application with emerging capabilities.

5.3.1.3 Outsourcing

Outsourcing is a very popular way of doing business. As the competition increases the pressure on cost leads companies to find alternative way of doing business. Such as increasing the utilization of resources and minimizing some cost items. Outsourcing is a favorable way of utilizing resources because it requires less investment, and usually less operational costs as the outsourcer aggregates the demand from its customer base and utilize its resources in terms of economies of scale. Moreover, outsourcing companies may

operate in regions or countries with less resource costs such as labor costs. Some of outsourcing companies may also provides technology specific services such as invoicing and billing. Outsourcing also helps companies to focus on their core business as the companies do not need to concentrate on non value creating activities.

Generally outsourcing is much more common for billing and invoicing, call centers, customer care, field support and installation, supply chain management, information technology and recruitment processes for telecom operators.

As 3G leads a competitive environment for communications and mobility market, company image, brand image and aesthetics would be emerging needs in CRM processes to improve competitive strengths. Companies will look opportunities to utilize their brand image assets to create stronger loyalty and customer satisfaction. To be able to manage these strengths effectively in CRM processes, operators must ensure that their outsourcing partners will fulfill all needs not only in terms of service quality and technology but also in terms of aesthetics. According to this aspect, outsourcing activities do not need to classify as high skill jobs or standard processes but they must also consider as the way of customer interaction.

Another concern is the effect of billing in CRM in Telecommunications. In communication industry one of the campaign management capability is the billing and rating capabilities of the operators. Because each campaign and price plan should be able to comply with the billing capabilities of switches or billing systems to be able to stay applicable. If billing systems are not able to support a campaign then this campaign can't be applied or if it is applied then the processes will crash and at the end the customers will be dissatisfied because of the consequences.

Table 5-5 Do you think that outsourcing will be more popular for telecom companies for following business functions after the implementation of 3G?

	No answer	Strongly agree	Agree	Do not know	Disagree	Strongly disagree	stdev	kurtosis	skewness
Finance	5.56%	12.96%	14.81%	22.22%	33.33%	11.11%	9.80%	0.925	1.020504
Billing	3.70%	16.67%	42.59%	11.11%	18.52%	7.41%	13.86%	3.01875	1.610726
HR	7.41%	14.81%	40.74%	12.96%	18.52%	5.56%	12.72%	3.333273	1.709662
Supply Chain	9.26%	20.37%	42.59%	7.41%	18.52%	1.85%	14.49%	1.863065	1.285794
Installation & Constru	5.56%	35.19%	25.93%	14.81%	16.67%	1.85%	12.45%	-0.761806	0.390939
IT	3.70%	33.33%	31.48%	7.41%	24.07%	0.00%	14.72%	-2.657327	0.064487
Customer Care (witho	5.56%	40.74%	24.07%	7.41%	16.67%	5.56%	13.91%	0.799381	1.206903
Call/Contact Centers	5.56%	50.00%	31.48%	5.56%	1.85%	5.56%	19.60%	0.282143	1.312077

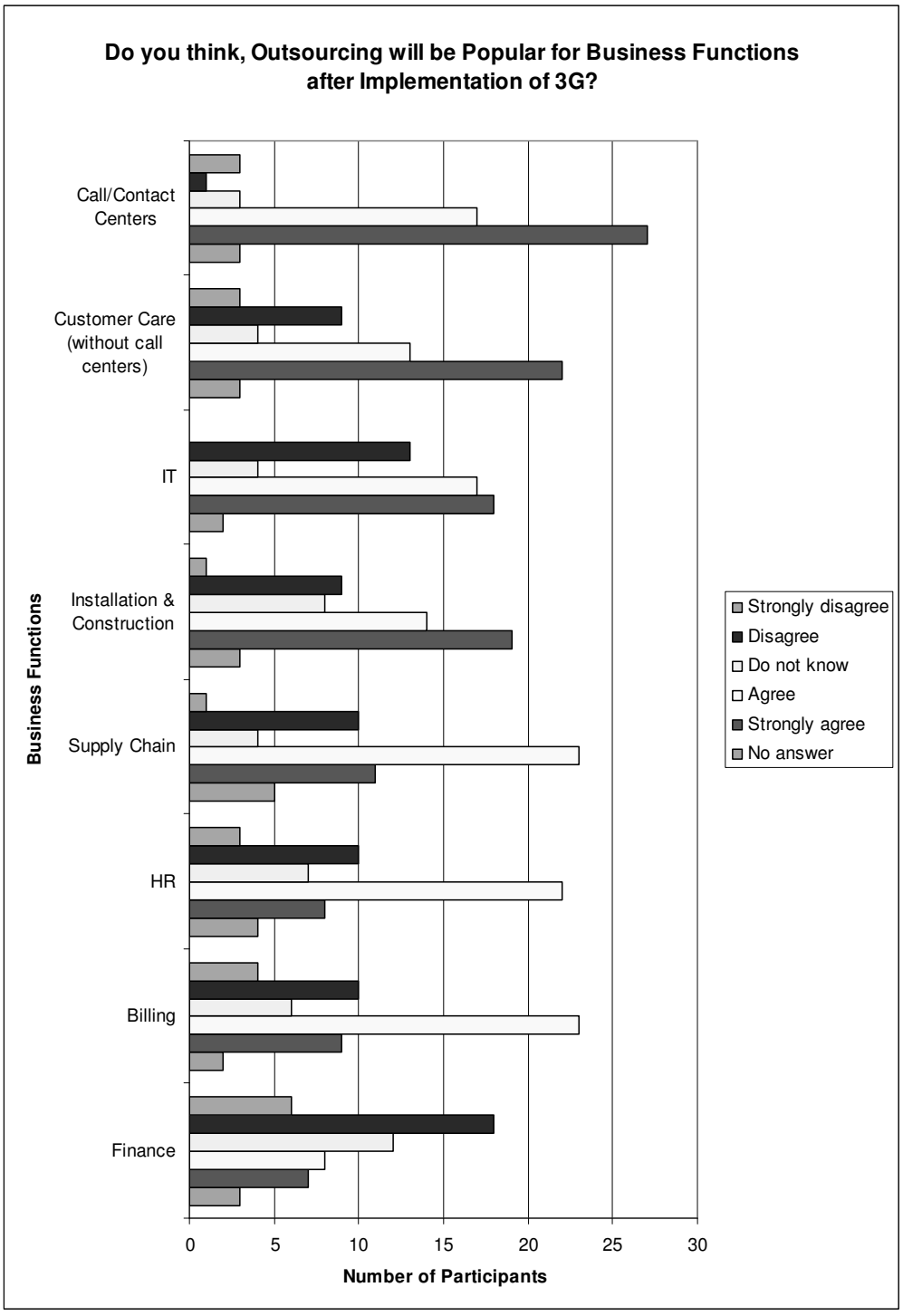


Figure 5-4 Research Questionnaire: Popularity of Outsourcing Business Functions

In the graph from research questionnaire results, given above, the participants are mostly agree or strongly agree that call center, customer care, IT, HR, billing, supply chain and

installation activities will likely to be outsourced by 3G wireless operators and finance operations would not be outsourced.

Table 5-6 Do you think that outsourcing will be more popular for telecom companies after the implementation of 3G?

	No answer	Strongly agree	Agree	Do not know	Disagree	Strongly disagree
mean	5.79%	28.01%	31.71%	11.11%	18.52%	4.86%
stdev	1.84%	13.70%	9.97%	5.51%	8.74%	3.56%
kurtosis	0.840	-1.342	-0.710	1.402	2.514	-0.012
skewness	0.862	0.416	-0.414	1.257	-0.348	0.389

On the other hand as considering the CRM drivers, outsourcing person to person customer interaction channels especially for direct sale, cross sale, up sale, complaint and inquiry activities should be managed very consciously.

Table 5-7 Popularity of MVNOs after the 3G Implementations

No answer	Strongly agree	Agree	Do not know	Disagree	Strongly disagree
3.70%	40.74%	20.37%	25.93%	7.41%	1.85%

stdev	kurtosis	skewness
15.18%	-0.61942	0.735193

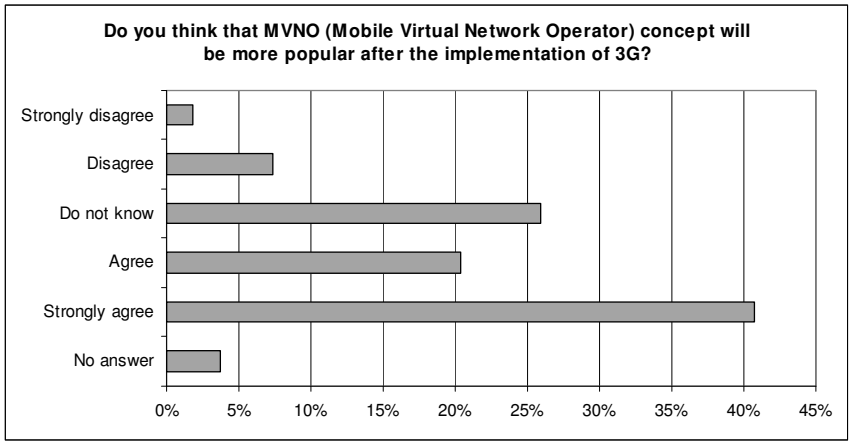


Figure 5-5 Research Questionnaire: Popularity of MVNOs after the 3G Implementations

Another option of outsourcing is operating as an MVNO. According to predictions and questionnaire results, MVNOs will enter the market and probably some of them will succeed as they will introduce their brand value and customer focused approach with lifestyle concentrated marketing efforts. Some operators may also utilize the MVNOs to provide more then one brand in the market to attract more customers to their network and utilize the infrastructure. And or focusing on other segments which they are not able to attract with their own brand image and applications. MVNOs will also be more attractive

because global service aim of major 3G providers and other financial constraints will lead mobile network operators merge. The gap in the market may be fulfill MVNOs.

According to our predictions the successful companies may outsource their supply chains, invoicing and collection processes, IT processes and applications, HR processes, non customer interaction customer care processes, legal services, installation of network infrastructure, network infrastructure (in case they are MVNOs), value added service applications (games, entertainment, content, mobile business applications, i.e.). But especially for customer touch points operators must evaluate the outsourcing alternatives carefully, as the bad decision will probably harm the brand image and so the value of brand assets.

5.3.1.4 Financial Structure

Telecom operators made huge investments during 1990's for broadband technologies, fiber networks, 2G wireless networks, DSL networks, satellite networks, cable networks and undersea transmission cables are some of most known items. They also upgraded their switches, installed ERP, network management, order management, billing, CRM, web systems and hired employees to match the demand. Then the to fill the capacity first they started to sell their capacities to each other with very low cost and then to be more competitive and to get more share in the market they used price competition. Customers also started to switch, the customer acquisition cost increased but the ARPU decreased. They tried to create more traffic to compensate the declining trend. Moreover global communication market also struggled because of the high level of investment and long pay back periods. Besides in many wireless market 3rd wireless network operator becomes unprofitable as markets are saturated with two wireless network infrastructure.

An expected complementary trend with these findings is that according to industry research a wireless telecom network operators will continue to merge as they established joint investments or basically some big players acquire the other companies. This trend will lead evolved wireless group of companies that operates on global basis.

Table 5-8 Do you think that more acquisition and merge will be held in the telecommunications industry?

No answer	Strongly agree	Agree	Do not know	Disagree	Strongly disagree	stdev	kurtosis	skewness
0.00%	31.48%	37.04%	12.96%	16.67%	1.85%	15.14%	-1.636398	0.326395

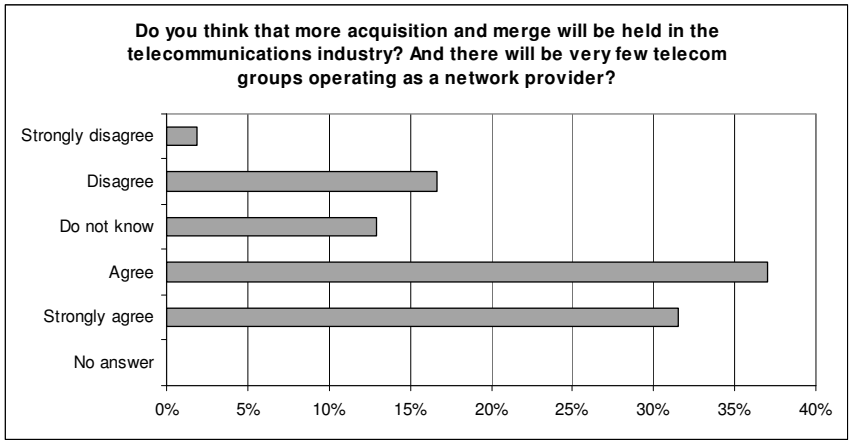


Figure 5-6 Research Questionnaire: Will Wireless Operators Merge?

According to questionnaire participants they also expect to see more acquisition in the industry after the implementation of 3G networks. This trend will support the globalization of applications vision of the wireless operators. It will also enable to have larger customer data banks that support many customers in many countries. The analysis of this merged customer databases will enable operators to perform better need analysis predictions, customer behavior predictions. They will also be able to track the competitor's customers if there will be no limiting regulations to prevent sharing of customer databases within the group of companies.

Another finding of the questionnaire is the expected positive effect of 3G applications and services on ARPU. As it is given in the figure below, only less then 10% of participants think that the 3G will affect the ARPU negatively. This finding is also supported by the next one which suggests that the non voice services revenues will dominate the voice services revenue.

Table 5-9 Do you think that 3G will create positive effect on ARPU?

No answer	Strongly agree	Agree	Do not know	Disagree	Strongly disagree	stdev	kurtosis	skewness
1.85%	16.67%	55.56%	16.67%	9.26%	0.00%	20.32%	3.668199	1.806659

Table 5-10 Do you expect non voice services revenue will dominate voice-services revenue?

No answer	Strongly agree	Agree	Do not know	Disagree	Strongly disagree	stdev	kurtosis	skewness
1.85%	14.81%	33.33%	12.96%	33.33%	3.70%	13.86%	-1.866964	0.425232

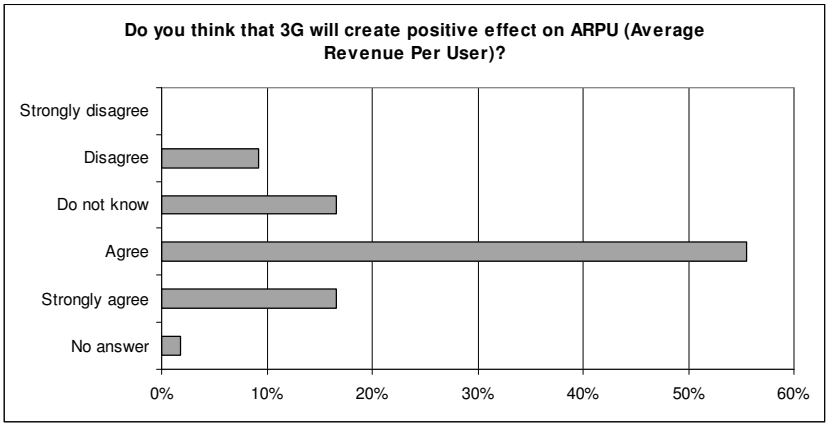


Figure 5-7 Research Questionnaire: Will 3G Services Affect ARPU Positively?

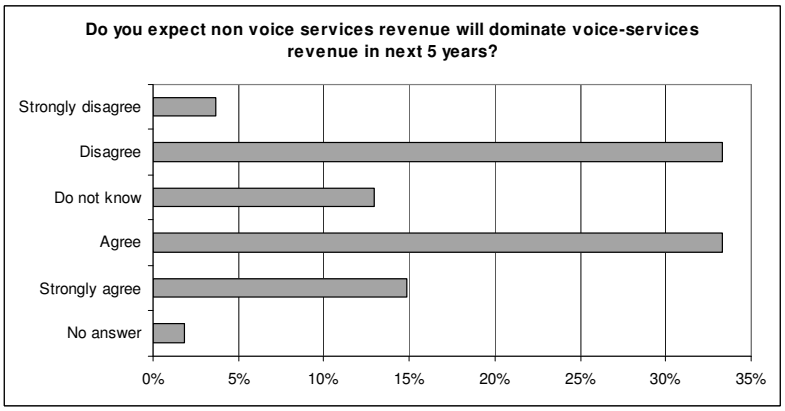


Figure 5-8 Will Non Voice Services Revenue Dominate Voice Services Revenue in Next 5 Years?

Our findings points out that simple voice and rich voice services will be dominated by other 3 G services in the near future.

Moreover, consumers are willing to spend 50% or more above their current spending to purchase new wireless services.

As a result it seems that even though the financial resources would be limited as a result of on going investment and acquisitions. The wireless operators will invest in 3G technologies to receive ARPU increase effect. They will also look for low per subscriber infrastructure costs where capacity enhancement will be necessary. However a portion of customized infotainment revenue may become opportunity cost as operators may want to provide some infotainment services free of charge to create loyalty regarding the fact that as the number of application subscription increase per customer, the likelihood of churn will decrease significantly.

5.3.1.5 Channels & distribution

The starting point is to consider objectively who should dictate channel strategy, the customer or the supplier. In general, the customer's needs must first be considered. If customers in the firm's target segments have demands that can be satisfied best through a particular channel strategy, this should be emphasized in the firm's CRM strategy. As we have experienced through our research, channel strategy becomes relevant because the target customer segments want it that way.

5.3.1.6 Development of multi channel strategy

Our studies shows that in order to developing a multi channel strategy, following actions need to be taken in to consideration

- Develop strategic multi channel objectives
- Understand customer and channel touchpoints to leverage advantage
- Undertake a review of industry structure and channel options
- Understand shifts in channel usage patterns
- Review channel economics

Developing an integrated channel management strategy must be considered in detail.

5.3.1.6.1 Channels in general for telecommunication customers

Traditionally mobile operators use physical channels to reach customers and sell their services. They also enable dealers or physical sales points to sell handsets or other accessories to realize additional revenue both for their own budgets and the dealer's budgets. Their distribution operation is normally focused on fulfilling the card, telephone, handheld devices and accessories inventory and transportation. Other bi directional channels are used to communicate with customer to develop account, resolve their issues and complaints, to provide technical support or to provide customer interaction for other customer care or marketing purposes. Mono directional channels are just focused on communicating the corporate messages to the outside world. Channel alignment and integration is one of the major goals to implement efficient CRM operations.

5.3.1.6.2 Portfolio of the channels

The portfolio of channels will be another concern while discussing the channels. As wireless bandwidth would increase by the 3G capabilities; wap and video phone capabilities would be implemented widely on cellular phones. Wap capabilities will lead wap channel. Its integration with video phones will lead video call centers where customers will be able to communicate with call center agents on video phone, they also will be able to browse in wap or internet collaboratively. In some cases customer would be involved in conference calls between more then one agents. For support functions video phones can be used to actually show the visual environment rather then describing it by words on phone. Agents will be able to see and observe the visual cross channel issues and solve them much more rapidly.

5.3.1.6.3 Special applications of channels

Retail and credit enabler business models also require specific channel and distribution enhancements. In Retail enabler business model the required level of distribution depends on the degree of retailer. If the operator is evolved in to a full retailer model and sells various services and products during its wap channels then distribution may need to be provided; and to do so, operator can use its own physical channels and network such as customer pick up points, or a delivery services which will deliver the products to the customer's shipment address. In both cases item delivery status tracking may be a good capability. If a deliver service is used then there needs to be an alliance which will enable high level of integration within processes. If the retailer model is not a full retailer but mostly acting as a marketplace then the market place may aggregate the deliveries and create revenue from that or may let each supplier to handle its own delivery. Then each delivery status information would be a parameter in back office integrations of order management systems. Operator may also enable these independent suppliers to use its own distribution and dealer network to create customer pick up points.

For credit enabler business model, sales points are channels. The basic requirement for business sales point is to be able to integrate with retail pos systems effectively in a way that customer will be able to perform its payment safely and fluently.

5.3.1.7 Partnership

All business models, network aggregator, ASP, portal, retailer, credit enabler and even pure operator will gain strength with partnerships. To be able to go on global service coverage operators will at least need alliances. Moreover for application or information based services these alliances would be also very important. According to questionnaire results, over eighty percentage of participants believes that partnerships and alliances will be crucial for the success of 3G bundled application and service offerings. Quality of partnerships, alliances and combination of their strengths will be very important. By the end of 2003, i-mode service of Japan (equivalent of 2.5 G) was supporting 70,000 partner sites. With the implementation of 3 G services these partners will probably grew up.

Table 5-11 Do you think that developing marketing and bundle partnerships will be crucial in 3G business models?

No answer	Strongly agree	Agree	Do not know	Disagree	Strongly disagree	stdev	kurtosis	skewness
1.85%	50.00%	33.33%	7.41%	7.41%	0.00%	20.29%	-0.24925	1.157064

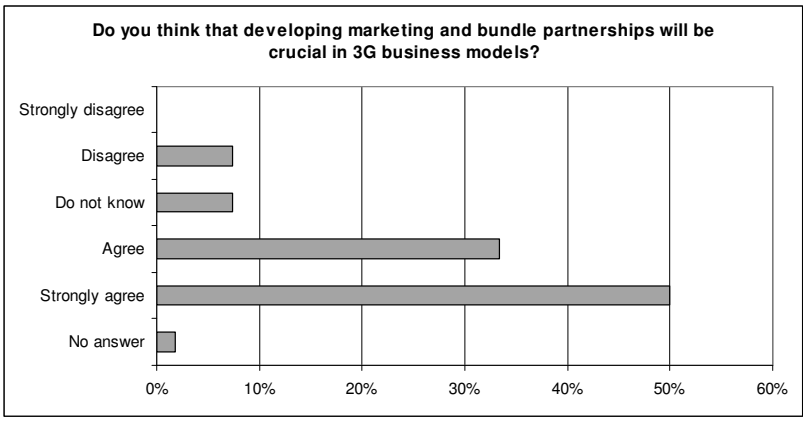


Figure 5-9 Research Questionnaire: Will Partnerships be Crucial?

Especially for exclusive partnerships where the certain applications and contents will be only offered via a particular mobile operator, customer satisfaction of the content and applications will also affect the overall customer satisfaction for the mobile operators. The alliances and partnerships must also be in conformance with brand image.

Table 5-12 Will Telecom operators support new business models on time?

No answer	Strongly agree	Agree	Do not know	Disagree	Strongly disagree	stdev	kurtosis	skewness
1.85%	5.56%	38.89%	16.67%	33.33%	3.70%	16.02%	-1.859862	0.642735

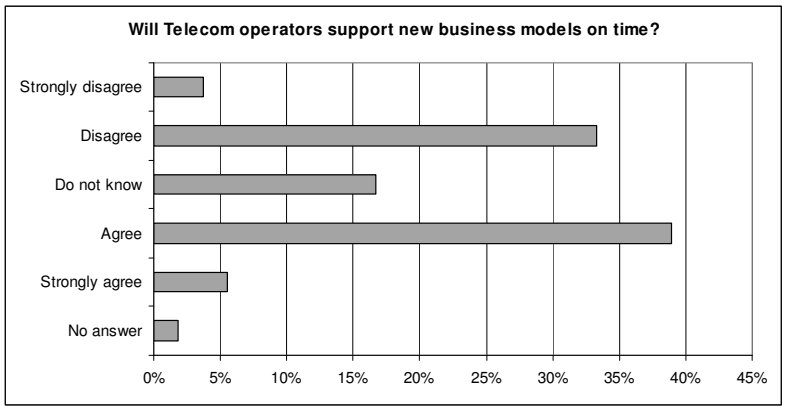


Figure 5-10 Research Questionnaire: Will Operators Support New Business Models on Time?

In technology management one of the most important think is the planning of the deployment of the technology in industry wide. For example if a company produced DVD players but no one in the entertainment industry supports DVD movies, music, data storages and discs. If no one will be able to find DVD movies in movie rentals or retail shops, then the DVD can not be successful. Even the quality of the movies will affect the acceptance of the DVD players within the industry. That's why operators must carefully coordinate the application deployments and their partnerships.

However to assume that every partner would be successful will be a wrong assumptions. Of course some partnerships will be more valuable and value creating then others. Some partners may struggle a lot as tying to survive in the market. The business models should accept that not every partnership will survive at the end but the ones which deliver value or recognized as delivering value may probably survive if they are also profitable. The subscription to surviving applications and contents would not be a problem but if a certain exclusive partner will fail then the subscribers who are customers will suffer.

Another important alliance category would be pure technology providers which will create communication infrastructure and capabilities, such as Alcatel, Nortel, Cisco, Siemens, Nokia, Ericsson and Motorola. Handset devices, switches, fibers, chips, antennas and software (billing, network management, CRM) will manage the capabilities in some constraints. How ever these companies are in fact the suppliers to deliver a total competitive offering that promises value to the customers, requires partnership and alliance approach.

Table 5-13 Will Telecom providers' business partners and business customers support new business models on time?

No answer	Strongly agree	Agree	Do not know	Disagree	Strongly disagree	stdev	kurtosis	skewness
1.85%	7.41%	42.59%	25.93%	18.52%	3.70%	15.71%	-0.016435	0.928078

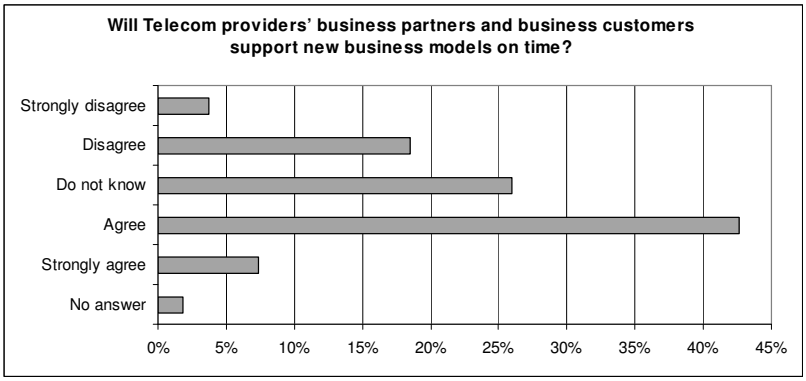


Figure 5-11 Research Questionnaire: Will Business Partners and Customer Support Business Model on Time?

Mobile operators will also start to establish alliances and partnerships with white goods, home appliances, brown good, automotive and building construction companies to implement the ubiquity, telematics technologies. These technologies as required to make communication between home appliances, would be developed collectively. That's why the operators who develop integration standards and processes with the home goods manufacturers will also gain strength in the markets that these goods are delivered to.

Customer experience will going to depend on how the customer will benefit from the handset or mobile device as long as it is using the mobile operators services. Not all of them but most of them will consider their over all experience as an indicator of mobile operators success in its business. In other words customers would like to experience a smooth integration which enables them to control over the processes independent on whether the process is managed by the partner or the operator. Of course this vision is seemed like an utopia, an illusion for tomorrows world especially when the listeners consider about how hard is the integration of many independent systems. One can easily say telecom companies are not able to integrate their own information systems and processes by now, how can they integrate in the future? However it does not limits the expectation of customers, and the drive to satisfy customer needs to stay competitive in the market will lead operators to integrate their customer care and interaction channels to

partner systems for various capabilities. These selections of capabilities would depend on the importance of the customer consideration and also the ease of integration. Moreover operators will not integrate with all of its partners in the same way but will prioritize them in terms of expected capability and value of combined offering. To ease that problem, operators will declare some standards as declaring their buying power especially on weaker partners. Normally these standards will be defined combined with the operator and the first partner that satisfies this capability.

As the result of questionnaire shows, questionnaire participants believe that mobile operators will integrate their products with partner companies and sell them to their customer base. This will probably leverage the strategic importance of partnerships in 3G model. To manage these strategic effects companies will implement or reengineer their partner relationship management processes. There may be also partner management modules for telecom companies which specialize on integrating content, transaction, billing and customer care data flows.

Table 5-14 Will Telcos start to sell new services which are provided by partner companies?

No answer	Strongly agree	Agree	Do not know	Disagree	Strongly disagree	stdev	kurtosis	skewness
7.41%	29.63%	55.56%	5.56%	1.85%	0.00%	21.85%	1.316947	1.465362

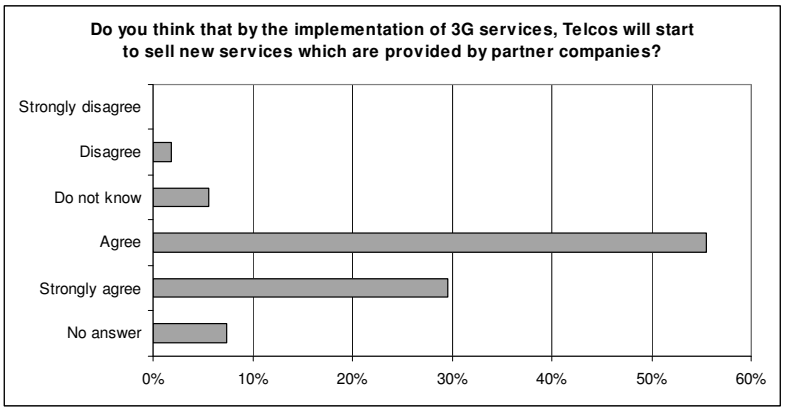


Figure 5-12 Research Questionnaire: Will Telcos Sell Partner's Bundled Products and Services?

5.3.1.8 Competition

According to over eighty percentage of questionnaire participants, 3G will increase the competition among operators. This affect can be reasoned by either the survival activities performed by the substitutes or by the product form competition performed by 3G operators in the same market.

Table 5-15 Do you think that 3G services will create challenging competition?

No answer	Strongly agree	Agree	Do not know	Disagree	Strongly disagree	stdev	kurtosis	skewness
0.00%	27.78%	59.26%	5.56%	7.41%	0.00%	23.25%	2.09721	1.604859

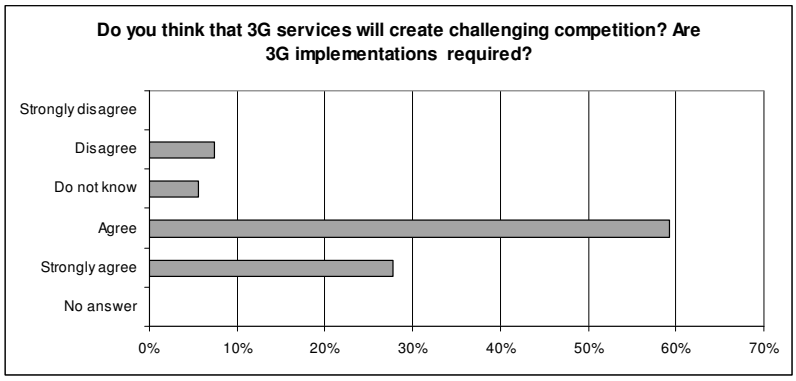


Figure 5-13 Research Questionnaire: Will 3G Services Create Competition?

As customers will be able to churn easily with owning more rights such as number portability, the competitors will try to acquire the customers from their competitors. Substitutes such as 2G, 2.5G, satellite voice communications (Global star), satellite data communications (teledesic), GPS, wireline and wireless LAN companies will bring their characteristics benefit in the front line. The offers may involve price plan, the extension of mobility or high bandwidth capabilities. Among these substitutes only 2.5G service providers would be able to offer similar value packages like the 3G operators. That's why if the competition would be on application basis then the most threatening competition would be between a set of operators covering 3G and 2.5 G services. On the other hand most of the 2.5G operators are expected to switch to 3G networks, and therefore the base competition in terms of combined value may apply within 3G operators and MVNOs. Within 3G Operators and MVNOs the basic driver of the competition is the application portfolio and matching and communication its capabilities with the needs of individuals.

As churn levels in wireless market is expected to grow in following years and customer acquisition cost may increase, loyalty will be a shining star to survive in the competitive market. To secure loyalty operators and MVNOs will deploy customer centric approaches to their processes, they will understand and expect the future requirements and behave accordingly. Moreover as the government deregulates the policies to make subscribers switch easily among operators, companies will create new tools to provide loyalty among their customers. Three main driver of these tools will be understanding and predicting the

customers needs and future behaviors more accurately, providing more applications of the services and persuade users to be subscribe to more then one offerings, and as a third one to align customer care services and brand image in a way that customer will also satisfy with indirect benefits of the services that matches their own unique life style. Especially identifying the life style is different from the previous use of life style because in these cases operators will look for not the segments but the individual's life style. It can even affect the communication accent and culture in multi ethnic and cultural communities. Of course these activities must be constraint by discrimination acts and should be implemented very responsively.

Table 5-16 Rating of the market acceptance of the business models

	No answer	Do not know	Strongly successful	Successful	Unsuccessful	Strongly unsuccessful
Portal	7.41%	14.81%	5.56%	48.15%	20.37%	3.70%
Content/Packager provider:	3.70%	24.07%	3.70%	50.00%	16.67%	1.85%
Trusted Partner:	3.70%	20.37%	12.96%	44.44%	16.67%	1.85%
Application Provider:	3.70%	14.81%	11.11%	51.85%	12.96%	5.56%
Mobile operator:	7.41%	7.41%	31.48%	44.44%	5.56%	3.70%
Mean	5.19%	16.30%	12.96%	47.78%	14.44%	3.33%

	stdev	kurtosis	skewness
Portal	16.65%	3.170339	1.749686
Content/Packager provider:	18.56%	1.675569	1.400986
Trusted Partner:	15.40%	2.104731	1.313296
Application Provider:	17.76%	4.841824	2.129567
Mobile operator:	17.05%	-0.441716	1.182486

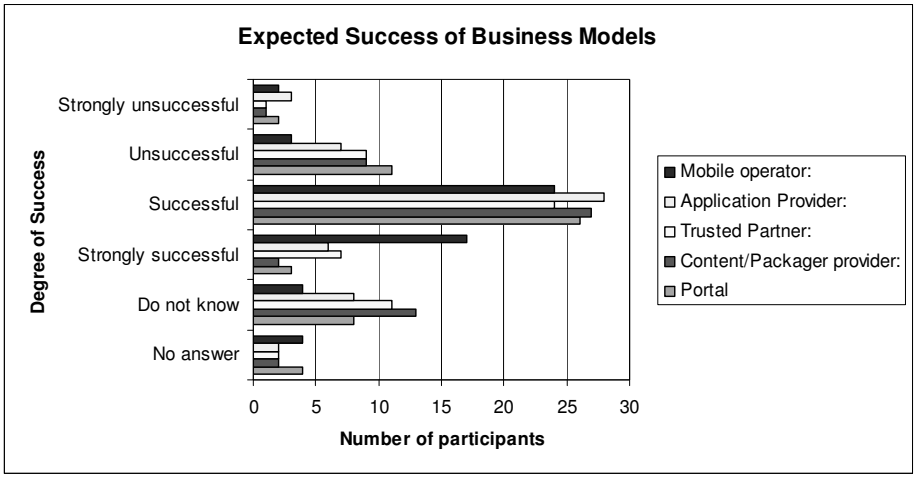


Figure 5-14 Research Questionnaire: Which Business Models will be Successful

According to questionnaire results, business models would be successful. In this questionnaire there are five business model indicated in terms of success which are mobile operator (pure operator and network aggregator), application provider (ASP), trusted

partner (credit enabler), Content/packager provider and portal (portal). According to this approach, pure operator, network aggregator, portal and credit enabler models will be successful if they are implemented properly. Retail business model was not considered in this questionnaire since this business model classification was not yet identified before the preparation of questionnaire. However initially, general expectation for retail model is that it would not be very successful as eshop or emall, but may create opportunity and revenue for both the customer and the operator on mobile promotion and address based advertisements..

5.3.1.9 Markets

Furthermore, an MNO does not only face competition from other MNOs in the provision of a mobile portal but also from the device manufacturers (e.g., Nokia could program their portal or homepage to be the default on all of their phones and other access devices) as well as current Internet portal companies, as witnessed by the launch of initiatives such as AOL Anywhere and Yahoo Everywhere. Similarly, in the provision of payment mechanisms for mobile services and applications, banks could be potential competitors.

In CRM strategy another important driver is the understanding of changes in market behaviors. According to six markets frame work that we have deployed for our thesis, the basic markets of the companies to be considered is customer, internal, supplier, influence, referral and recruitment markets.

5.3.1.9.1 Customer markets

Customer markets can be considered in two groups which are new customer markets and existing customer markets. New customer covers the customer who has not engaged with operator's services who are from new customer segments (new country, new region, new age group, particular industry, specific profession, or combination of other segment variables i.e.) or existing customer segments. Existing customers represents the customer who are engaged for one or more services. In Europe or Fareast number of cell phone users per hundred person is quite high. In these markets, the focuses of the customer markets will probably switching the existent customers and churn would be a high consideration. Companies will also develop innovative micro market segment based solution to pick the non users and to engage with them. In contradiction, the operators who are operating in

low density markets will basically focus on basic benefits of mobile communication they will not be focused on delivering innovative micro segment applications. However this lack of focusing on existing customers and not creating an experience with improved value offerings, the domestic market operators will be vulnerable. Especially in some promising markets with huge populations and fast growing economies, these vulnerabilities may be penetrated by foreign operators which are implementing global coverage for their 3G services. Most probably these operators will enter the market in corporation with a domestic player and then their success would be shared by particular domestic players.

In high density markets as churn will be very important consideration, companies will try to implement good churn prediction capabilities which will enables certain Analytic CRM investments. To do so, companies will integrate the information received from partners and customers and then combine them with CRM, order management, billing and other switch based information to be able to get historical behavior based and profile based information for each customer. These bulk data will be stored and analyzed in giant business warehouses. Capability of making instant analysis on these data would be a differentiator capability in terms of marketing perspective. Also operators will look for storing this information and to use it for further campaigns as a defined segment or results performance analysis.

Another important classification for customer market is the differences between business markets and retail markets. As it is observed main organizational customer care and sales organization differences between segments are based on business and retail market customers. As Business customers can be easily recognized and as they have high value potential, operator's business units are much more adopted their one to one marketing capabilities in terms of sales processes for business customers.

5.3.1.9.2 Internal markets

Globalization of services may need 3G operators to work in foreign markets. Also to be able to give immediate response to SLA inquiries, improvement of quality requests, new application and price plan requests and to be able to research and implement new innovations, 3G operators will need a good integration within their business units. The integrated information flows between business units, cross department improvement and resolution teams, and understanding the over all structure of the business would be

important as the rapid response to the market requires collaboration not only interaction channels and or customer facing departments, but also every other business unit. As the value of offer depends on its pre process steps, company should implement its culture as a whole. The fact is operators may want to go on outsourcing to manage their costs, then the communication between business units would be more important.

5.3.1.9.3 Supplier markets

As its shown in the results of questionnaire every customer segment has different priorities and benefit expectations from their mobile hand sets. Not only applications but also handset capabilities effects the customer experience. Handset suppliers may recognized the customer experience drivers by them selves as operators will also identify.

Table 5-17 What are most important 3 features on a handset to support 3G services for following user groups?

	Teens	Adults	Business	mean	stdev	skewness
No answer	14.20%	12.35%	12.35%	12.96%	0.010692	1.732051
Brand	9.26%	6.79%	2.47%	6.17%	0.034369	-0.782152
Latest model	14.20%	1.85%	3.70%	6.58%	0.066579	1.582523
Design and color	20.37%	4.32%	1.23%	8.64%	0.102737	1.55785
Technological capability	5.56%	8.64%	22.22%	12.14%	0.088669	1.498959
Price	9.88%	18.52%	9.26%	12.55%	0.051769	1.704387
Simplicity/usability	3.09%	16.67%	7.41%	9.05%	0.069382	1.007538
Durability	1.23%	5.56%	4.94%	3.91%	0.02337	-1.597097
Coverege and connection quality	0.62%	12.96%	19.14%	10.91%	0.094292	-0.93522
Battery life	0.62%	5.56%	11.73%	5.97%	0.05567	0.330832
Weight	0.00%	1.23%	0.62%	0.62%	0.006173	0
Personalization	1.85%	2.47%	1.23%	1.85%	0.006173	0
Radio/mp3 player	3.70%	0.62%	0.00%	1.44%	0.019843	1.545393
Video player	3.09%	0.62%	0.00%	1.23%	0.016332	1.457863
Game	9.88%	0.00%	0.00%	3.29%	0.057022	1.732051
Keyboard	0.00%	0.00%	0.62%	0.21%	0.003564	1.732051
Size of screen	0.62%	0.62%	2.47%	1.23%	0.010692	1.732051
Quality of screen	1.85%	1.23%	0.62%	1.23%	0.006173	0
stdev	0.060221	0.059435	0.068148	0.062601	0.00482	1.680278
kurtosis	0.51181	-0.026955	1.069896	0.518251	0.548454	0.052835
skewness	1.160995	1.056916	1.387773	1.201895	0.169178	1.024317

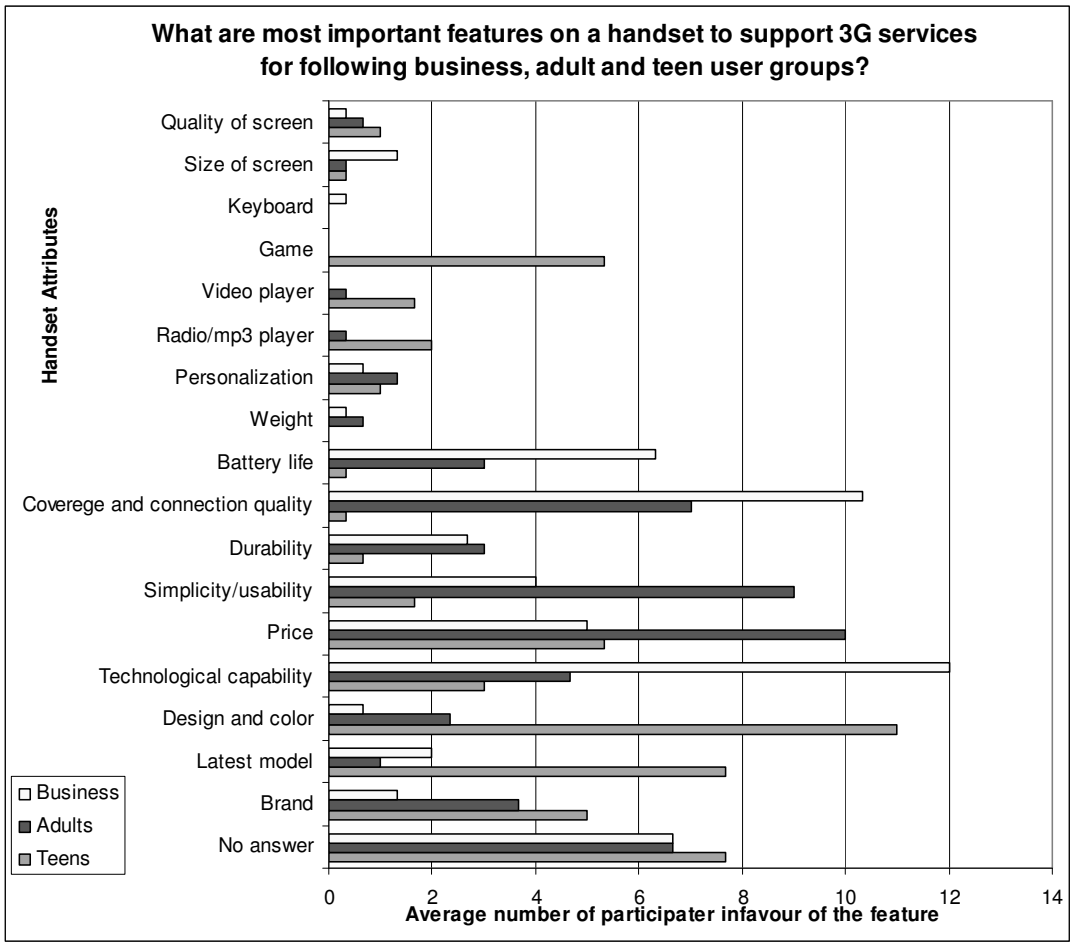


Figure 5-15 Research Questionnaire: Important Handset Features

Basically as operators do not share their behavior and customer segment analysis results with vendors publicly, vendor need to identify all these as making third party market researches or creating loyalty communities (club nokia i.e.) and etc. However sharing this information can be a powerful competitive strength for both parties. With good alliances and partnership agreements the innovation can be secured and expanded rapidly. As a summary there are seven different suppliers for telecom operators. Which are;

a. Infrastructure vendors

b. Software vendors

c. Partnership application vendors

d. Telecom operators (wirelines, long distance and roaming)

e. Content vendor

f. Consultants

g. Other suppliers for specific processes.

Communicating wit all these suppliers and sharing the objectives and information will help customers to more rapidly provide the kind of services that customers are looking for. As with CRM customers drive the operator, operator must drive its suppliers according to the needs of its customers. As the number of telecom groups will decrease in the market, the buying power of the operator group will increase and some of them even will lead the big suppliers. One of the most important factor for 3G markets is the customer would be loyal to innovative products that satisfies their needs, and this innovation will not only have a technical aspect but also a business and psychological aspects. Therefore innovation should not only focus on creating technology but creating value with the engagement of all possible suppliers in the value chain.

5.3.1.9.4 Referral markets

As loyalty becomes more important the tools creating loyalty will also gain important. One of the most rapid and effective loyalty creating tools for new customers is the referral markets. As a customer receives positive reference for a company or service the time of his or her becoming loyal is decreased, their buying decision is positively influenced and the probability of becoming loyal is increased. That's why as churn is becoming a major problem for the profitability of wireless operators, impact of referral markets become crucial. To utilize referral markets, operators will focus on reaching new customers with the help of delighted customers, supplier markets and alliances. These alliances even can be between telecom operators and more over 3G operators. For example a wireline internet service provider may promote a certain 3G wireless operator for a field sales teams or mobility needs of its corporate customers. Or a wireless operator may advise another wireless operator for certain regions where its network has no coverage.

In order to utilize delighted customers or suppliers, operators will need to use association enablers on their customer data tables. These association enablers will first be implemented as a manual data input which will be filled as they interact with the customers but then with enough data up to certain level of confidence this information may start to be predicted and then reviewed during the interactions. That may lead customer interaction channels to retrieve more information.

5.3.1.9.5 Influence markets

One of the most important influence market is the standardization bodies. As far as standardization of infrastructure, access methodologies and frequency licensing; the standardization of integration of processes will also play a important role in leveraging the services. Unfortunately because of the numbers of vendors, softwares and operators this standardization may only be implemented within a limited approach. Mostly standardization of processes will be provided by the dictation of the mobile operators.

Other important drivers of the influence market are generally the regulations such as ownership of networks, LATA limitations, 3G license fees, number portability, privatization act, do not call lists, health considerations, emergency call regulations and etc. Below the further regulation expectation for mobile businesses is given as a research questionnaire result.

Table 5-18 Do you think legislations such as "privatization act", "spam mailing" and "do not call" lists will become a constraint on business models in the future?

No answer	Strongly agree	Agree	Do not know	Disagree	Strongly disagree	stdev	kurtosis	skewness
9.26%	20.37%	38.89%	3.70%	22.22%	5.56%	13.30%	0.26636	0.922681

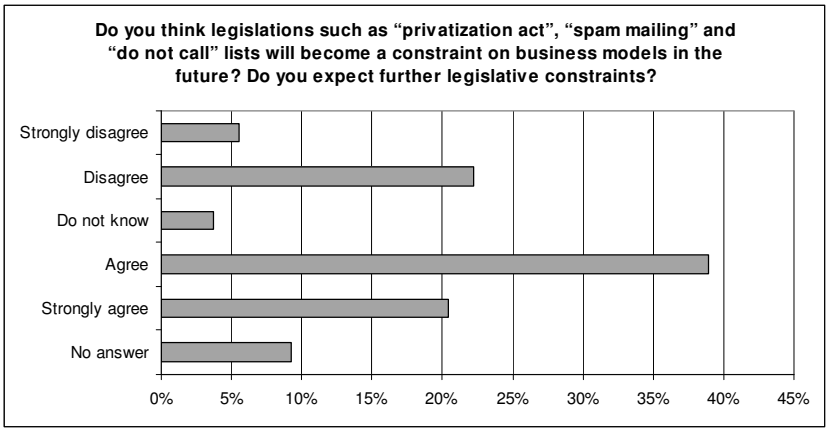


Figure 5-16 Research Questionnaire: Expectation for Further Legislative Limitations

As the cost of 3G License decreases the cost of investment will also decrease and the barriers would decrease to switch to 3G network structure for mobile operators. That will help operators will be more profitable and provide services with lower costs, more over as the competition will grow up the investment on customer and aggressive campaign management will increase.

Number portability will also enable customers to switch between operators easily as they do not need to change their numbers. That will be another driver that increase the level of competition in the market. On the other side privacy act will prevents companies to share customer specific information, these acts will also limit the amount and type of data to be stored by the companies about individuals/ customers. Both of them will decrease the decrease of marketing capabilities, especially in terms of analytic capabilities and customer contacts. On the other hand as telecom companies can be able to know their customers individually (at least they know the billing addresses), and identify millions of customers, some retail companies may want to use this capabilities. However as operator can not be able to share the customer data freely, then these retailers may need to organize joint campaigns to promote their products and services. Combination of this fact with location based promotion/advertising may create a profitable and attractive market for telecom operators as retail enabler.

Another pull back for these applications is the legislations related with promotional marketing. For example according to the new directives in UK, where unsolicited direct marketing is made to individuals, whether by fax, email, SMS or using automated calling systems, the consent of the recipient must first be obtained. Traffic data directives, location based marketing directives and corporate channels marketing are the other area where database marketing capabilities are constrained for the privacy of the end user.

Do not call list is the result heavy direct marketing and outbound sell utilizations. In fact it is the flag ship of regulations related with the permission based marketing. Permission based marketing would be a hard concept to be implemented with regulations since the freedom of speech is concerned, how ever ethically it will be considered more frequently and the operators who will implemented it properly will refine the pushy and frustrated affects of spam and other interruptions. As spam is a huge concern in internet market it will be a major concern in mobile markets if no solution is implemented. Even by 2003, 3G and 2.5 G operators started to inform their customer base about how to protect them selves from the spam messages and mails.

Regulating bodies also considers the health issues related with mobile communication. Yet, there is no prove of negative effects of cellular communication for the subscriber. However, it is discussed that, use of cellular phones may increase the body temperature,

especially for head (since subscribers keep phone very close to their head while talking). These concerns may limit the use of cellular phones by the young segments in the future but for few more decades there is expectation of the proof of harm of cellular phone. Also these concerns may address the use of headphones and speaker phone systems to be able to keep the cellular away from the head. Moreover videophones also require to keep phone away from the head to be able to get the view of the caller. This functional usage may also be a positive effect for 3G services. To be able to limit the harm of the cellular communications, regulating bodies are currently limiting the level of energy transmitted by the radio waves in terms of type of antenna or device. In anyway an unforeseen prove of harm of mobile devices or the discussions may result as a negative psychological effect on buying decisions.

Regulating bodies are also forcing mobile operators to implement location services for emergency calls. Operators are considering the required level of accuracy of the location detection capability. Probably this capability will also determine the diversification of location based applications for customers and how significantly an operator will be able to give driving directions or send mobile promotion messages or may be the e-coupons that can be cashed in the nearby physical retail stores.

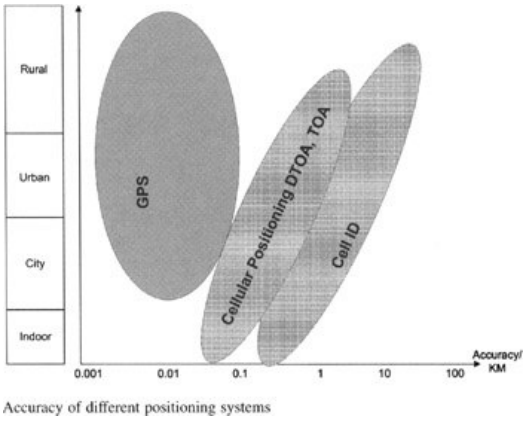


Figure 5-17 Accuracy of Location Based Services

5.3.1.9.6 Recruitment markets

These strategy concerns may lead companies to implement process, technology and organizational improvements which require new skills for the employees. Some of these skills can be adopt as training the employee resources but some of them may need hiring

new employees. These employees will probably need to be customer centric and to understand the company culture and processes. To be able to provide this sources cost of resources will not be the only driver. That's why companies might need to reconsider location of some of their facilities and the quality of service provided within these facilities. As especially the call center would gain more importance and work load with the implementation of videophone capabilities to agents, the companies may want to locate their call centers in the domestic market, where the call center is working for.

5.3.1.10 Service portfolio

As needs segmentation is a popular way of segmentation, below service portfolio effect is considered in terms of changes in the needs coverage or 3G services. But before that the basic expectation about the implementation period of services and applications is listed below. According to survey results, widely implementation of 3G applications will take two to four years.

Table 5-19 When do you expect the new 3G services will implemented widely in the market?

No answer	Do not know	1 years	2 years	3 or 4 years	5 or more	Will not implemented
1.85%	5.56%	3.70%	27.78%	46.30%	12.96%	1.85%
mean	**stdev**	**kurtosis**	**skewness**			
14.29%	15.61%	123.50%	143.87%			

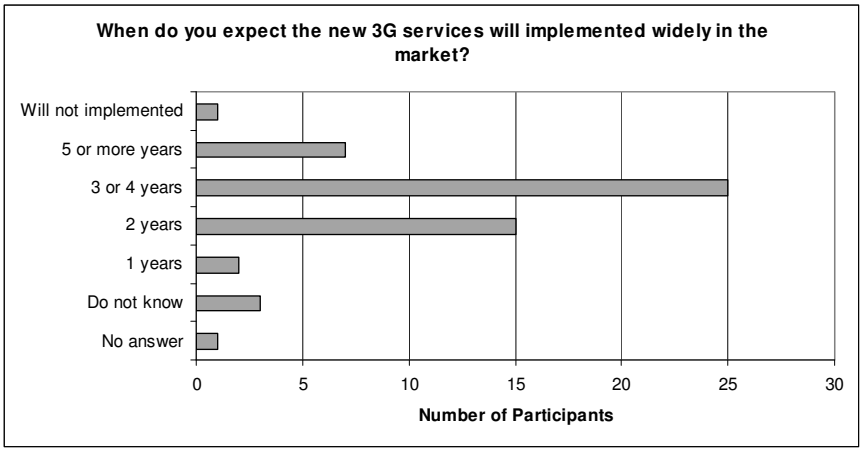


Figure 5-18 Research Questionnaire: When will 3G Services be Implemented Widely?

The classification of needs made according to the Maslow's hierarchy of needs Each application of 3G services have different capabilities which satisfy these needs. Below each

level of needs will be discussed individually in terms of 3G and 2G-2.5G applications capabilities.

Table 5-20 Considering Maslow's hierarchy of needs pyramid for 2-2.5 G vs 3G?

	2 G & 2.5 G	3 G
Physiological :	4.83	4.89
Safety:	5.35	6.03
Belonging:	5.24	6.25
Esteem:	5.34	6.63
Self-actualization:	4.33	6.03
mean	5.02	5.96
stdev	0.44	0.65

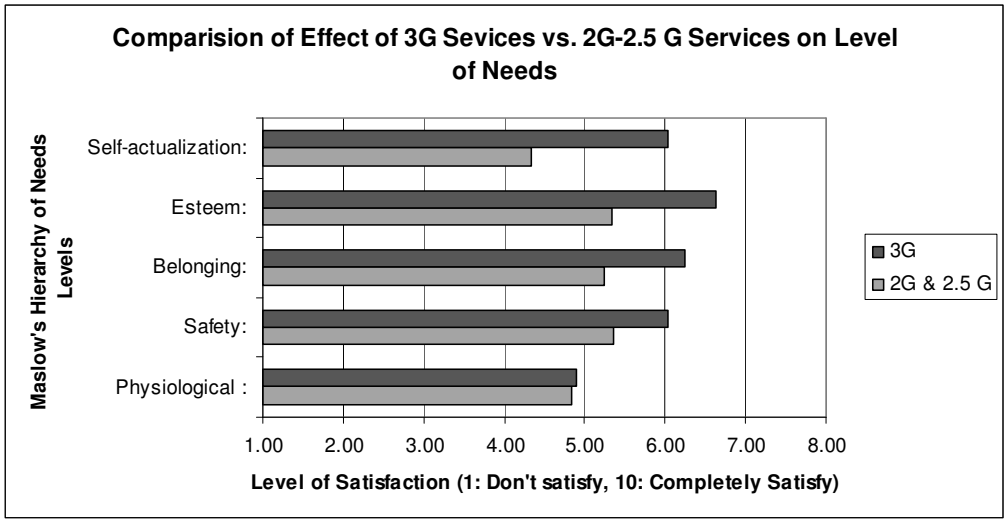


Figure 5-19 Research Questionnaire: Comparision of 3G and 2G-2.5G Services in Terms of Hierarchy of Needs

In terms of physiological needs normally both of the applications are not able to satisfy the needs directly. What they can do is they can be used as a tool to drive a way to satisfy these needs. For example finding a drugmart, hotel and restaurant by phone or wireless web can be classified in direct affects of the capabilities. Even as a tool, the difference between two groupings is not distinctive. Whereas the survey participants assume their impact equal and on moderate level, they are almost do not satisfy level.

While developing the 3G security structure the following principle took in to consideration to leverage the security over 2G systems. According to that principle UMTS will,

- take into account the additional features needed for actual or predicted change in the operating environment.

- maintain compatibility with GSM wherever possible.
- retain those features of GSM that have proved to be robust and useful to the user and network operator.
- and add or enhance features to overcome actual or perceived weaknesses in 2G system.

On the other hand these security strategy is not the only security benefit of the UMTS for the customer point of view. Emergency calls and emergency call tracking, calling friends and relatives to ask how they are in terms of safety and health can be considered in safety and security needs. Also authenticated secure financial transactions can be considered as the satisfier of security and safety needs. In terms of security and safety 2-2.5G vs. 3G comparison has distinctive differences. First of all location based services of 3G provides more accurate location identification for emergency calls (in case GPS is not utilized for 2.5G) which enables to send rescue team more rapidly to the caller location and in less communication period. This information can also prevent drivers or strangers in urban and rural areas if it is integrated with appropriate content such as road maps. People normally call their relatives and friends and ask them how they are, especially if they are caring much. Sometimes voice do not gives the enough satisfaction, they want to see their face, see where they really are. In that occasions video phone communication is a good satisfier. In the future families would more probably choose videophones and video stream communications for their children to be able to track their children and understand their way of life. Also not only for peoples but also for business such as project manufacturing, export-import operations when people choose to communicate or in today's words, share information; they will rather use video communication to trust each other, to review the visual progress and to sense the visual status. Share of not video but written data is also important. To check web prices while physically shopping in the mall, to check agenda before making any plans, to track stock prices and special content focused news, being able to reach numbers from a research report in the middle of a meeting can be very valuable and may secure the customers in their daily life. Remote control of house appliance, lights control, refrigerator energy control, control of door lock for a friend while in holiday may be valuable and secure our interests. And finally, to be able to use mobile cash or mobile credit cards, which are deployed in handsets with better security and authentication aspects

may help customers to secure their assets. In fact both 2.5 G and 3G has similar capabilities, but of course 3G has more accuracy, better connection, authentication and accuracy capabilities. In terms of video stream line communications; in fact 2.5 is more suitable to send pictures then video streams. That's why 3G can be considered as having better capabilities to satisfy security and safety needs.

Table 5-21 Do you think 3G services may match the security needs? Video conferencing, location based services, 911 will led families to go on mobile as providing more security capabilities?

No answer	Strongly agree	Agree	Do not know	Disagree	Strongly disagree	stdev	kurtosis	skewness
7.41%	27.78%	50.00%	7.41%	7.41%	0.00%	18.81%	1.289323	1.414752

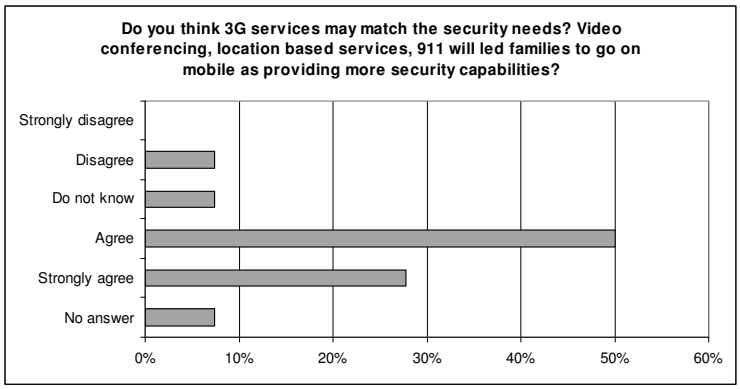


Figure 5-20 Questionnaire results: Will 3G Improve Security Satisfaction?

The love and belonging needs also another hierarchical level where the distinction can be observed. In fact belonging is the level where connectivity and communicating/ sharing is focused. The level of sharing experiences and thoughts is the differentiator for this need between 3G and other mobile cellular systems. Sharing experience can be sharing the activity, decision or a story. They can be shared via written message, speech or visuals. Enhancement of these capabilities will help people to be involved and socialize more with his or her friends. A lover may want to send a message to his or her lover, a teenager may want to ask his friend if the sweater is looking good using a video phone, a business man want to send a brief email about the status of their current business issues, people may want to find a community who loves trekking, snowboarding, skiing or with other hobbies, a person also may want to search personals and make a call or receive a call where caller can not see the number, a group of couples may want to decide where to go in a video conference session as hearing all decisions.

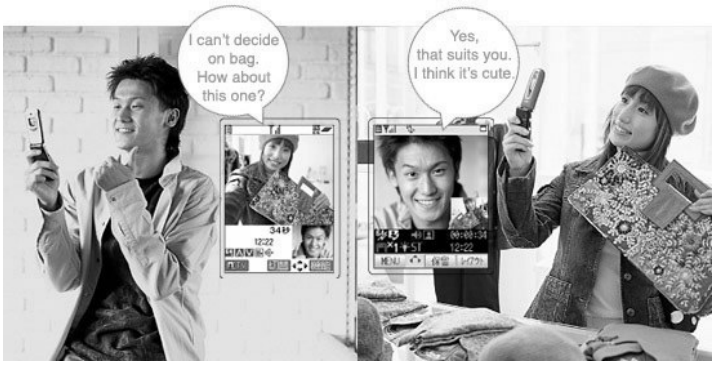


Figure 5-21 Collaborative Shopping in Physical Store

Combination of video, instant messaging, email, web content, and voice enables enhanced (sharing) capabilities for person to person and person to community communications in both directions. In terms of these combined value of these capabilities 2.5 G is able to perform most of them but in terms of cost and enhanced capabilities 3G operators may go way behind if they also enhance their alliance network to create more innovation for community and person to person communications.

Forth level in the hierarchy is self esteem. For both lower and higher self esteem needs satisfiers are not directly related with the services but their applications, the aesthetics and attitudes. In fact, as lower needs are such need for the respect of others, the need for status, fame, glory, recognition, attention, reputation, and appreciation. Then the basic one to one marketing becomes dependent on lower esteem needs as recognition, status, and attention are some of the key elements of retention and customer development management. Permission based applications which will help the recognition of the customer among operators customers and with the alliance of other companies' customer portfolios may help satisfying the recognition needs of the customer. Identifying the most important customers in every branch instantly may bring higher loyalty for a bank or a chain store. One of Turkish high quality confection store chain analyzed that 90 percent of their sales were dominated by 1% of their customers. These customers may only be recognized in some specific stores since their account representatives are working in that stores. When these customers were shopping from other stores it was almost impossible to identify them. Location based services and mobile authentications may help sending location based promotions or even identification of a customer in the store especially with the

implementation of RFID technologies. However privacy considerations and permission marketing ethics must be evaluated accordingly.

Table 5-22 Do you think the location based services will threaten privacy?

No answer	Strongly agree	Agree	Do not know	Disagree	Strongly disagree
7.41%	7.41%	33.33%	14.81%	35.19%	1.85%

stdev	kurtosis	skewness
14.25%	-1.874201	0.636232

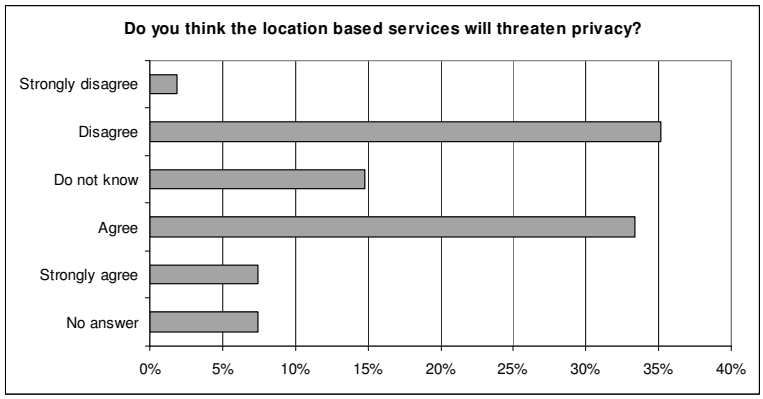


Figure 5-22 Questionnaire Result: Will Location Based Services Threaten Privacy?

Identification of customer during any interaction process as analyzing the customer experience and history (considering all relationships: family, business, community memberships), will also help the satisfaction of recognition needs. Credit approval and ecash services will be other tools as satisfying these needs. The higher form of esteem needs will be more related with hobbies, life style and customized attributes. Brand image, may considered as one of these attributes, shape, design and the durability of the handsets will also be considered in that category as extreme sports fans may look for different attributes then the business men. Business applications for personal use can also be considered as higher form, as a career oriented business man look for enhanced application capabilities, self actualization satisfaction may also be satisfied with career oriented enhanced applications.

For business use, the impact of applications varies from the initial impact analysis, as information becomes vital in competitive business environment. The priority of needs change among industries and also among companies within the industries. As the mobility of company operations increase or the mobile information flow becomes a constraint for the business operations, then network aggregation such as wireless VPN, or mobile access to legacy systems become more important. Especially for ASP and network aggregator

business models these data integration and mobility needs becomes physiological for business customers.

According to survey results, as the thesis agree the distinctions will occur on esteem, belonging, safety and partially for self actualization hierarchy levels. For physiological level, the satisfier effect is only occurs for some business customer segments and in contradiction with the results of questionnaire, in that segments 3G services will perform better then especially 2G services as bandwidth and reliability will be a major success criteria for the requested applications.

Table 5-23 Rating of the expected popularity of the given communication services after the implementation of 3G services

	Average
Conferencing:	7.55
Messaging:	7.98
Internet Access/ Networking:	6.89
Location-Based Services:	6.43
Entertainment:	8.17
Financial Services:	6.56
Information Services:	6.64
Mobile Commerce:	6.59
mean	7.10
stdev	0.70
kurtosis	-1.45
skewness	0.73

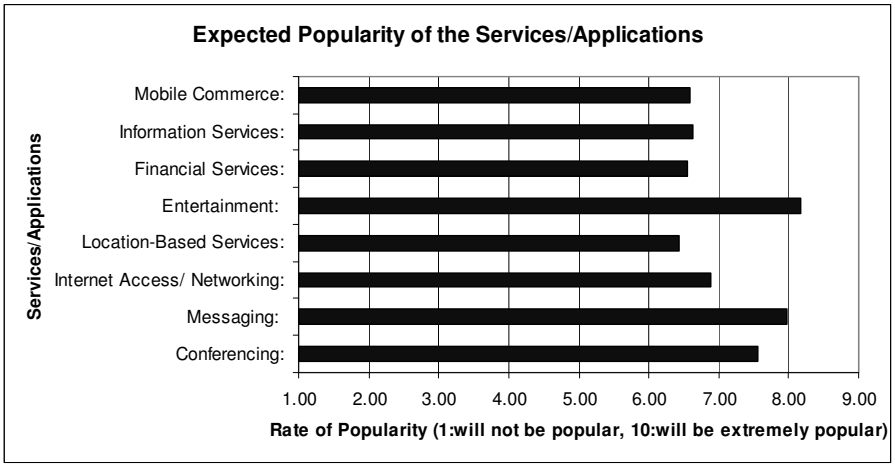


Figure 5-23 Questionnaire Results: Expected Popularity of Application Categories?

According to the survey results, all application categories will have moderate to high popularity as given above. Survey participants believe that most popular applications will be entertainment, messaging and conferencing services.

Survey participants also think that these applications, together with location based services will be the killer application for the 3G business models. Among fifty of the participants 30 of them explained their opinion while mentioning multiple applications. Below is the results.

Table 5-24 Questionnaire Results: What are the killer applications?

Businesss Capability	Number of Votes
Location Based Services	11
Video Conferancing	10
MMS	9
Entertainment	8
ASP	5
Internet	4
Mobile Commerce	3
No killer application	3
Online Availability	2
eBank	2
Adult Entertainment	2
VoIP	2
Intranet	2
Text to Speech & Speech R	2
Security	1
Simple Voice	1
Community	1

5.3.2 Process

The classification of processes is defined according to process model definitions of Telecom Operating Model given in 3.2.2. Below there are also some additional processes which gained importance with the increasing competency and the integration requirements of third parties and processes, such as distribution, marketing and partner management processes. Marketing and distribution processes are formed by the separation of core functions included in sales processes in TOM process model. Partner management process model is added because of the increasing importance of partner and alliance management operations for the mobile operators. Service Planning and Development process is included in order to define the drivers related with new application and service development. And Service problem management process is included to identify the integrations of problem handling more clearly.

5.3.2.1 Marketing

As 3G brings more competitive markets, identifying the micro segments and customer needs become more important. Operators need to deploy processes that supports loyalty and retention. Companies would need better analytical skills to address the customer behaviors and predict the next ones. Combined analysis must be executed with certain association analysis for the portfolio of applications that a customer is subscribed or interested to. These analysis should not only cover the operator based application and services but also partner and alliance offerings. As the number of campaigns will increase the marketing processes must be more flexible to adopt and apply campaigns more rapidly. For main segments marketing departments may need segment leadership. Strategic market plans, product plans, segment plans and meta campaign management plans should be prepared regularly to guide marketing departments while managing enormous numbers of campaigns. A customer should be designed to be able to member of multiple segments, but enhance campaign exclusion capabilities must be also apply to prevent to send multiple campaign offerings which are conflicting with each other. Sales, and customer care channel and business units must work collaboratively marketing and marketing should clarify its goals and objectives. The campaign strategies must be in conformance with the company culture and aesthetics and the message should be prepared clearly. In order to be able to identify the success of campaigns performance criteria should be set and using warning limits and critical action limits, the campaign might be updated in terms of segment and offering to respond markets initial approaches. For to be able to do successful performance management, return investment analysis for campaigns and customer lifetime value analysis must be done accurately. To do so, cost reduction, revenue enhancement, direct-indirect cost and revenue items must be defined. And the cost structures must be enhanced by activity based costing (ABC) capabilities. Customer life time value analysis may also need to use prediction models to be able to finalize the calculations. Marketing processes' focus must change in to micro segmentation and one to one marketing approach and should deliver information about future requirements. This information must especially be communicated with service planning and development processes inputs for them.

5.3.2.2 Service planning and development

This process is simply the product and service development process. Besides it also plans the network enhancement and investments. 3G effect will especially create a heavy work load for these processes. As number of applications and the related parties will increase, operators may need to form cross functional and departmental teams including the partner companies. Patent and technology rights may become a concern for common development platforms and should be regulated accordingly. Marketing must be involved in the development processes in terms of product managers and related core segment leaders. Also profitability analysis should be implemented for each application development on scenario basis to estimate the result of new application enhancement. Applications must be developed to be able to available mobile, globally, instantly, timely, personally and user friendly. The support must be involved in the development process to be able to be available with the application launch. Also the use of the application should be considered to be easy especially for its focus segments.

5.3.2.3 Sales

Sales must identify its channels and integration methodologies over partner and its own business units. Sales targets must be able to updated with campaign implementations, but also the basic performance criteria should be secured to compare with the updated and the actualized figures regularly. Sales must focused on developing customer to improve the loyalty and should take the responsibility of customer for customer's life time. The premium systems should considered to be able to deploy the ability of providing premiums to the sales points that have a referral or influencer roles on sales basis. Dealer management must be considered in a way to strengthen dealer's financial structure. Partners and alliances may use dealer networks and this may create a revenue generating strength for dealers. Sales channels must be work collaboratively with segment managers from marketing departments. Sales processes must be prepared according to a ultimate generic model which will work for all services and products to minimize the confusion of implementing various independent processes for different applications and products. This ultimate generic model must use a generic logic, the processes must not aim to diversify according to services but according to customers. Cross sell and up sell processes should be implemented within the constraints of permission marketing to some extend.

5.3.2.4 Distribution

Distribution is now performing to handle promotion materials, handset logistics and phone card logistics. As the partnerships evolve and especially if retail business model is introduced in some operators, distribution processes may need to support entire distribution capabilities or outsourced distribution processes or only customer pick up point logistic processes in addition to current processes. The ERP systems, order management systems and ATP controls must be integrated with especially dealer management and CRM systems to be able to integrate the stock levels and ATP checks. Order tracking capabilities also may implemented to support enhanced processes of order handling.

5.3.2.5 Order handling

Order tracking and the integration of services would be one of the most important driver for order handling operations. The activation process must assure to activate right telephone card, with right telephone number immediately. Ability of customizing mobile phone number according to customers request while activation can be a good differentiator in competitive market but it will require good integration with network management systems on customer interaction channels, including dealers. As many applications and many partners will enter in to the market, integration must require at least the activation of partners' applications for the customer. Customers also must be able to apply or track their orders from every channel. To be able to attract new customers cancellation orders must not require customer interact with customer care services repeatedly to reconnect for basic applications. As 3G will deploy better bandwidth with enhanced handsets, wap channel may gain more importance. To be able to manage high customer interaction costs in call center, account management and dealer channels, operators may also utilize wap channels if the order handling applications will be easy to use and understand.

5.3.2.6 Problem handling

According to the survey results, the effect of 3G for problem handling process will be high for value added applications, service quality, technical support and mcommerce related inquiries.

Table 5-25 Rating of the impact of 3G communication technologies for customer care processes or question classifications.

	Average
Service Provisioning:	6.18
Service Complaints:	6.15
Billing Inquiries:	5.55
Lost /Stolen Equipment or Fraud	5.08
Technical Support:	7.15
Service Quality:	7.42
mCommerce Transactions	7.30
Value-Added Services:	8.17
mean	6.62
stdev	1.05
kurtosis	-1.09
skewness	-0.08

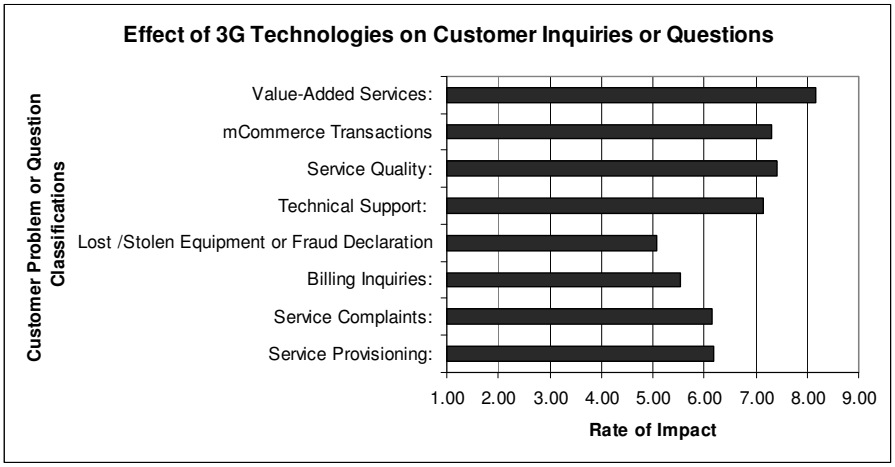


Figure 5-24 Questionnaire Results: Effect of 3G on Customer Inquiries

For better customer experience problem handling systems should integrate with order management, trouble management and billing management systems to make customer be able to reach any kind of information related with the application that they are inquiring about. These processes also must support all two way communication channels. The customer interaction history and the result of the inquiries and complaints must be stored for future anlysis. As 3G supports web, video stream and voice stream communications, operators may better to support all these capabilities together and switch among them during one unique session of inquiry. Customer may want to explain the problem with video streams, which time as voice is recorded in call centers, video streams also may need to be recorded for quality reasons. As video stream communication is enabled also new segments such as people with hearing problems start using these applications and services.

In that case call centers may need to support deaf gesture languages. Problem handling processes also may need to support some applications provided by exclusive partners.

On the other hand problem handling processes must be able to integrate with service problem management processes.

As each customer connection might be an opportunity for up sell or cross sell offerings, these offering should be evaluated respectively to prevent the frustrated customer to be offended by the pushing attitude.

5.3.2.7 Customer QoS management

As 3G introduced number of application that a customer will subscribe to increase, more over as CRM is introduced with one to one marketing mentality, the customization diversification emerges. That's why each customer become having their unique application portfolio with their unique performance criteria. The good QoS proceeses should be implemented in a way to create customized SLAs, to be able to define their applicable performance cretarias rapidly in comply with company constraints, to save the SLAs, to communicate the SLA performance criterias to make sure that related performances are monitored accordingly, to calculate the low quality costs or high quality performance revenues, to apply this revenues and costs to customers billing statement, to analyze the results and to update the offer if it is needed. These SLA results must be able to be accessible from any channel by the customer.

5.3.2.8 Partner management

Partner management systems in fact covers many systems which covers, content aggregation, secure transaction integration with marketplaces and financial institutions, billing and mediation integration with other network systems. The over all account receivable, payables, cash management, order management, and financials systems and processes should be considered in this process. This partner management process has an integration with almost every other customer care focused processes. The success of partner management processes will effect over all success of the mobile operators for many business cases. Operators may need to work with many partners that's why they have better to declare a generic partner integration and management process to be able to standardize the operations in their domestic market. Most probably the first players will have the

opportunity initially to dictate the market but then the mobile operators which generates more revenues for the partners would be more important and it may take over the control of market as the partner will not want to loose the revenue generating operator.

5.3.2.9 Rating and discounting

Billing processes one of the most important constraints in new campaigns and customer focused marketing implementation. The available rating capabilities, data business rules and implementation requirements should be documented in detail to be a guideline for new campaigns. As the number of campaigns will increase the modeling, feasibility and the piloting of the campaign on billing systems would be an important driver on over all campaign implementation capabilities.

With 3G not only voice but also data based video, message, mbusiness and many other applications will be used by the customers. These diversification of applications may require innovative rating capabilities such as aggregating of partner bills, connection based, data transfer amount base, transaction base, type of data and its amount base, or subscription based rating. To be able to accomplish that, operators may need advanced mediation tools to receive and accumulate data from various information systems. The billing information also must be able to be presented to customer in detail form from every communication channel.

5.3.2.10 Invoicing and collections

These processes are likely to be outsourced by third parties. These processes should be able to handle invoice and payment matching, legal processes for uncollectible account receivables (bad debt accounts), banking transaction aggregations for customer accounts, aggregating bills of different applications and discounts, refunds, reimbursements, fines and service level quality/performance fees to the invoice, The invoice must be able to reported in detail in terms of applications and transactions, the status of the transactions. The customer care processes may need to reach to the invoices as its shown in the printed form to be able to discuss inquiries and complaints of customers. And invoices must be able to recall from any channel by customer, including the old invoices, such as internet, wap, call center, dealers, account managers, kiosks and walk in offices with certain authentication security.

5.3.2.11 Field service problem management

Some applications such as network aggregator may need field support. Especially with the bundle products which are going to be installed on customer site or broken handsets and for such occasions. Field support may be necessary. Field support may need to use enhanced trouble scheduling systems which are going to be integrated with problem handling processes in terms of activity and technology. Video communication instant schedule updating, pushing schedule update messages to the customer instantly, especially video communications may be very help full for field service engineers to be able to make their preparations for the repair before they go to the location such as need of long cable, long ladder, and etc. In Field Service Management processes field engineers may also support the sales and customer development processes as they inform customers about enhanced connection or application capabilities.

5.3.2.12 Service problem management

Service problem management is the processes where the problem managements are handled with network and back office operations. 3G's impact on competition, high customer expectations and broader range of partners may require operators to enhance better trouble management support system integrations. These processes also may enable to provide support for partners application which will also require a better range of technical skills for the organizational resources in the support business units.

5.3.2.13 Content management

By the availability of wireless internet and full time available data communication in 3G environment the demand for content through wireless handsets may increase to manage these demand companies may need to provide content internally and or externally. External content may require aggregation, organizing, reformatting and billing integration requirements. On the other hand internal content may require internal content preparation in addition to external content requirements. Both types of interactions may require an internal business unit to effectively manage the content delivery services.

The fundamental question from the customer perspective is whether the channel offers added value to the activities of the customer base such as banking. As far as the latter is concerned, each infrastructure element (Internet, telephone, cell phone, PDA) has its own

inherent benefits such as software independence, mobility, etc. Context is also very important for the customer who wants a high-quality product.

5.3.2.14 Customer interface management

Basically customer interface management processes are focused on bidirectional communication channels. Initially to provide better customer experience in 3G competitive environment, it is expected to be able to provide aligned processes and aesthetics in every channel.

The main concern for the management of the customer interface in a buyer–seller relationship has been to enable the smooth integration of the parties' processes. To a large extent, this became the job of key account managers acting as the customer's agents throughout the suppliers' organization. IT-concepts in the form of early customer databases or CRM programs were used to support the customer interface and the key account manager. The distinctive aspect of value networks in this respect is that the touch points and interfaces to the companies' customers have multiplied. Thanks that by now the complex interaction with different parties engaged in the selling process, such as retailers, distributors, manufacturers, resellers, and web channels has been partially and or fully enabled with the help of relationship technologies

5.3.2.14.1 Exhibitions and marketing events

Exhibitions and marketing events have capabilities of interacting with customer. Normally these channels are the less effected ones. Impacts can be mostly about either content or interaction method. In terms of content as number of partners will be higher, the events can be planned and presented with partners as mentioning the total offering value. Operators also may use messages and wireless web based solutions to receive participant's response for polls or for competitions with big prize. To identify customers location based information or short distance telematics can be utilized.

5.3.2.14.2 Dealer and walk in offices

In dealers and walk in offices, to increase the revenue partnering applications and products can be sold to the customers. Especially for exclusive dealers and walk in offices, the design of the innerspace, outside of the shop, the presentation of the products and services

and the attitude of the employees should be managed in a way to ensure the over all experience is going to represent the brand image. These physical shops may need to have few more technical skilled sales consultants to be able to explain the details of the services to some customers that inquiry advanced questions. Especially for the dealers who are focusing on the corporate customers. For the retail focused dealers, this may turned in to video phone kiosks that will handle the inquiry by a tech skilled sales consultant from the contact center/ call center. These kiosks may reduce the cost of hiring technically skilled sales consultants for dealers who has smaller revenue turn over. Dealers and walkin offices also may better to integrated to activation, order management and tracking, and CRM systems to be able to answer customer's specific inquiries. A help line for dealer would be very helpful especially implementing new campaigns, also dealers must be able to receive detailed information about the campaigns via web or internal portals. Dealers financial systems may also need to be integrated for automatic account receivable updates between the operator and dealers, this will lead more frequent reconciliation and better risk management in terms of financial aspects.

5.3.2.14.3 Account management & sales engineer

Account manager may be assigned to a customer or a group of customers. Sales engineers are assigned to presales and post sales project activities in order to help account managers for technical dimension of services and applications on project basis. As these channels are mostly mobile, the mobile sales support application access, knowledge base access and CRM access may be very valuable for these channels. As 3G will focusing on customized service portfolio and delivering value, account managers and sales engineers will be more focused on customer specific requirements and will offer services and offering that suits to client's needs.

5.3.2.14.4 Field support

Field support is normally more applicable for wireline or cable services which needs on site installations. If partnered solutions may need on site service then field support channel may be applicable. This channel is a very good cross and up selling opportunity. To be able to do this customer development, the field support engineer or employee must be able to see suitable offerings and also may take notes to the customer accounts that mention the observed opportunities. Also visit scheduling system must be able to be tracked and should

in form the customer if there is a delay or a probability of a delay. Trouble management and field support CRM modules must be accessible by field support employees by all times with given capabilities. Also the employees must be trained well to represent company culture and brand image appropriately. Customers should be able to evaluate the field support performance at all times using a questionnaire.

5.3.2.14.5 Call Center

Call center is probably the channel which will be affected mostly. Because of the limited bandwidth of telephone lines and the capabilities of handsets, call centers are limited with IVR, VRU, ADC and CTI; call centers are only handling voice calls and providing communication depending on sound receptiveness of the calling parties. With the enhancements of VoIP telephony and video data packet transferring capabilities, high bandwidth cable networks such as fiber and cable are capable of serving for other receptive senses such as sight in communication, as they utilize technologies such as ATM, DSL and SONET. As the increasing band width of wireless communications, wireless cellular networks are also becoming capable of carrying video streams.

To be able to provide video conferencing and or video phone calls or switching between different medias of presentation during a single call requires support at the endpoints of the network for the calling parties. And same support must be established throughout the path of data packages. For example is a caller who has 3G phone connection calls another person and wants to talk with video capabilities, then both handsets and the networks and transmission must be capable of doing there. If one of the parties is out of the town where only 2G or 1G (Analog) communication is provided there is no way for them to be able to make the video phone call. Even though bandwidth is not wide enough for many computer connections (56Kbps), internet subscribers are using web cameras to be able to communicate with each other. How ever in 2G systems data connection capabilities are so low that they are not able to afford the video calls. With the implementation of 3G, this capacity will increase 344Kbps to 2Mbps, which will be enough for video communications especially with ATM based transmission technology utilizations. The increasing demand on videophone calls will also create a need of visual contact in customer support calls, which will lead the evolution of video-call centers. Video call centers will be a real fact in the future. Many customers do not prefer call centers because they do not feel the human

touch on phone. If the communication preferences of people are classified in to categories, it will show up that there are people with visual orientation and auditory orientation. Visual oriented people are mostly the ones who like drawing or making gestures or trying to figure out some actions or shapes with their hands while describing some thing. Auditory or verbal people are the ones who tell the events or thing with using words. For the visual oriented people call centers are not so comfortable. There is something missing with communication. Video stream on video-calls may make these visual oriented people much more comfortable and it may increase the preferences on behalf of call centers since people will be able to see the call center agent while interaction with them. Then what happens if call centers will deploy visual call capabilities.

Table 5-26 Do you think that 3G will lead increase in usage of call centers?

No answer	Strongly agree	Agree	Do not know	Disagree	Strongly disagree	stdev	kurtosis	skewness
14.81%	14.81%	37.04%	16.67%	12.96%	3.70%	10.99%	3.388107	1.404902

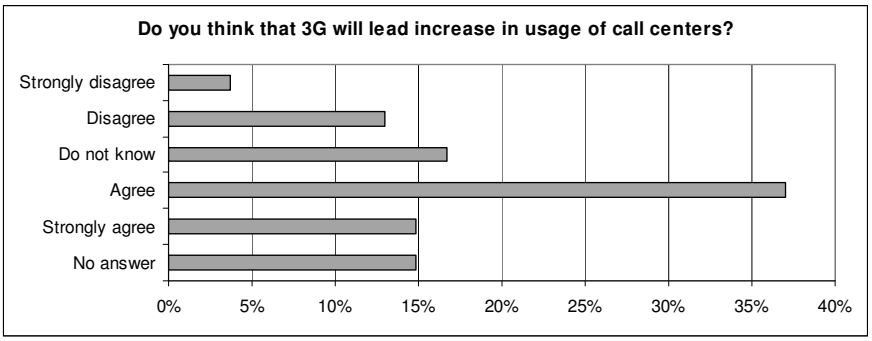


Figure 5-25 Questionnaire Results: 3G will increase the use of call centers

According to questionnaire over 50% of participants think that, the deployment of 3G technologies will increase the usage of call centers as given below, whereas the 30% do not agree with that idea. This figure also supports the idea that the visual oriented people may demand more video-call center contacts in the future. But when a video call is established the customer will start to see the call center environment, call center people and how they behave. Many companies use ultra modern and fashionable environments when they are presenting their call centers on commercials or advertisement. However, in contrast with this ultra modern and fashionable views the many call centers are not in very good conditions. In some companies they are even not good working office environment. In recent years to increase the work performance and decrease the turn over rate of the CSRs companies have been renovating their call centers. But even these renovations do not

comply with the commercials. Operators may want to improve their visual look in the call centers in terms of light, equipment, dressing and CSR gestures. In countries where there are strict laws to enforce equal opportunity these improvements may stay limited with the above classifications in terms of visual aspects. Unfortunately, in countries where there are more flexible laws, the operators may also try to employ good looking CSRs to represent their company especially for video calls.

Table 5-27 Do you think call center employee profiles will change significantly after the implementation of 3G?

No answer	Strongly agree	Agree	Do not know	Disagree	Strongly disagree	stdev	kurtosis	skewness
11.11%	9.26%	46.30%	12.96%	18.52%	1.85%	15.49%	3.748	1.785672

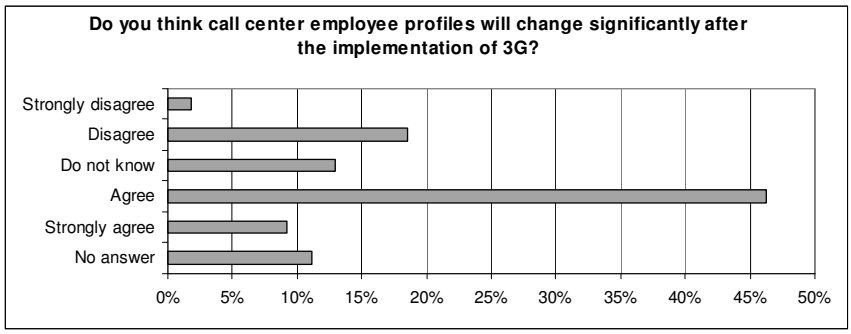


Figure 5-26 Questionnaire Results: Call center employee profiles will change

Mobile operators will support much more customized offerings with many partner companies, the skills of call center employees may need to be improved with internal trainings. Customers may also want to switch between media types in just one single call, while asking for support, such as visual looking to billing statement collaboratively on wireless internet, making a video call or a phone call. This capability will also provide extensive promotion capabilities while promoting the campaign offerings in outbound calls.

Table 5-28 Do you think operational cost of call centers will increase significantly after the implementation of 3G?

No answer	Strongly agree	Agree	Do not know	Disagree	Strongly disagree	stdev	kurtosis	skewness
12.96%	9.26%	42.59%	11.11%	20.37%	3.70%	13.81%	3.076057	1.671556

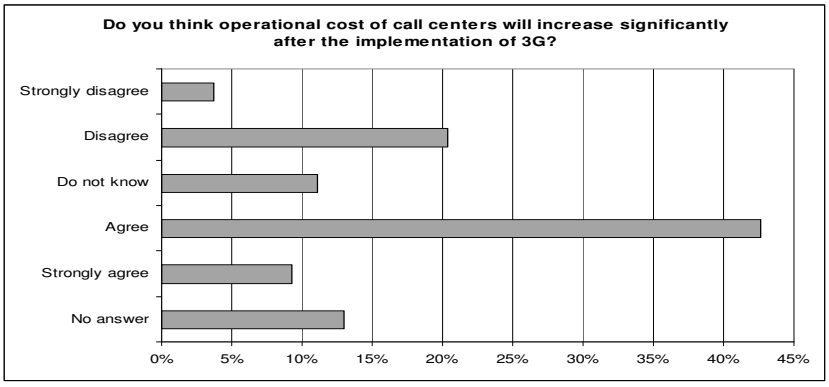


Figure 5-27 Questionnaire Results: Total cost of call centers will increase

The training of employees, to decrease the turn over of trained personnel, increasing number of call center agents to respond to increasing number of call center calls, visual changes in the call centers, technological improvements and their supports will all increase the total cost of call center operations.

Table 5-29 Do you expect overseas call center operations will relocated back to the countries which they support for?

No answer	Strongly agree	Agree	Do not know	Disagree	Strongly disagree	stdev	kurtosis	skewness
12.96%	5.56%	22.22%	20.37%	27.78%	11.11%	8.20%	-1.173469	3.16E-16

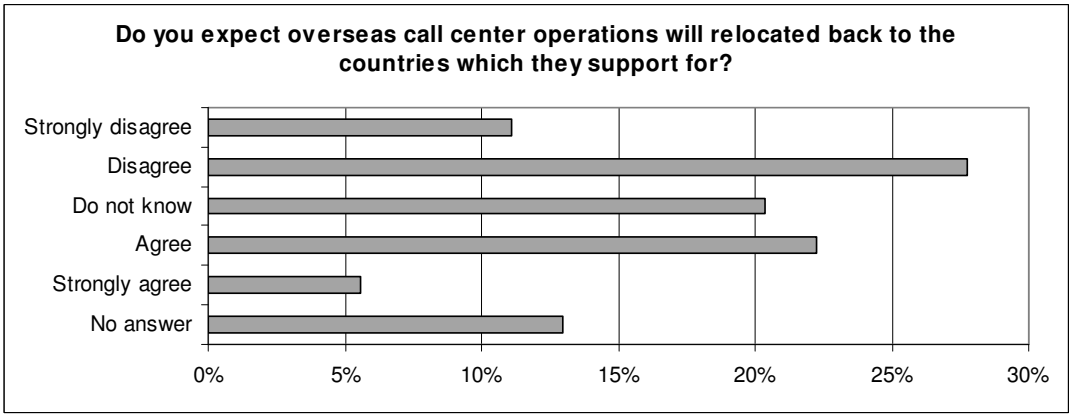


Figure 5-28 Questionnaire Results: Outsourced calll centers will be reconsidered

Besides visualization and improvement of call center image can impact outsourcing criteria for call center channels. Whereas the labor costs are lower in some regions in a country or in some countries in the world, also the accent and gestures changes. As gestures are used as a confirmation while in the conversations this cultural differences may not be welcome by the customers. Companies should manage outsourcing very carefully that the

opportunity cost of brand image must not be higher then cost reduction in labor costs. According to questionnaire results participants do not think that this will lead a problem to relocate call centers back to the originating countries. On the other hand, some high tech companies have already started to relocate their call centers back to originating country or another country which has better foreign language skills then the previous one. Most probably many operators will ignore these effects and will focus on cost reduction.

Table 5-30 Do you expect to face improved customer satisfaction in call centers after the implementation of 3G services?

No answer	Strongly agree	Agree	Do not know	Disagree	Strongly disagree
16.67%	9.26%	33.33%	18.52%	20.37%	1.85%

stdev	kurtosis	skewness
10.67%	0.691319	0.254056

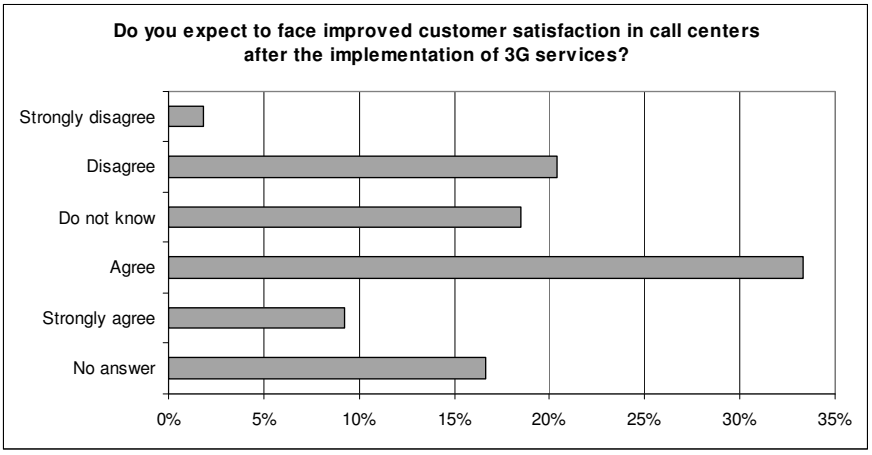


Figure 5-29 Questionnaire Results: Customer satisfaction will increase

As call center technologies and communication methods will be improved to adapt the 3G capabilities and competitive structure, the customers will be able to share-communicate more effectively, which will improve their satisfaction and trust to the communication. According to questionnaire results only 20%-25% think that 3G will not improve the customer satisfaction where 40%-45% of participants think that it will improve the call center customer satisfaction.

5.3.2.14.6 Kiosk and POS

Kiosk channel will be used almost like a internet channel how ever kiosk may have some more capabilities as Kiosks will be owned by dealers or operators. As ATM machines work in retail banking. Kiosks may also be used for payment, refund, cash credit withdrawal, prepaid mobile phone card purchasing, and the distribution of some partner materials are

offers. How ever cash withdrawal and partner ship offering distribution, would be the ones related with 3G. For the operators which will operate a credit enabler business model, may use pos machines on retail sites for transactions. Also the retail enabler model may enable loyalty bonus point redemption capabilities to some kiosks or pos machines on the retail shops, chains or shopping malls.

5.3.2.14.7 Digital TV

In some countries operators are not able to own more then one communication network. Such as if they have PSTN network they can not operate a cable or wireless network. This regulation based on to make market more competitive as the technologies are converged and the physical access layers started to support many communication methods. Digital TVs are operating over cable or satellite systems. For the cable case network supports two way communications, but for satellite case the network only supports one way communication. When customers buys a pay per view movie, or makes a transaction it also generates an information to be transmitted to the digital TV broadcaster organization such as billing, email, banking inquiry or other transaction. To transmit this data normally digital TV box uses PSTN and calls the broadcaster companies PSTN modems regularly. With the higher connectivity capabilities of 3G and its telematics capabilities this transmission can be made directly by VPN. And the users may become interacting with their digital TV with their mobile phone. With the help of partnerships users may be able to switch between the tools TV and phone for visual communications such as videophone and wireless internet screens.

5.3.2.14.8 WAP – wireless internet

Wireless internet may be the most affected channel at the end. There may be two types of content in wireless internet which are push and pull types. Sending information about customized campaign offerings such as better price plan for the specific customers needs, a message and the trial membership for new capability or a new application on the network, partnered offerings such as a discount promotion for a specific shop in a shopping mall where the customer is visiting, or some lottery participation invitation during a marketing event. Instant messages or email alert mechanisms. For push type contents operators may get revenues from partners as they are promoting their products, on the other hand as effective marketing requires permission marketing and there may be some regulations in

the future against spam messaging, operators may also share some of this revenues with its subscribers in terms of free minutes, invoice discounts, refunds or special lotteries.

Pull based content is basic portal and web based capabilities. Customer is able to reach the personalized or generic content in intranet or extranet. Information about how to use a specific mobile application, billing inquiry, issue tracking and inquiring, web based payment, use of exclusive or generic applications, purchasing transactions of partnered products or services and free wireless web search are the some of content that may be available. To be able to minimize search time, preferences based customized content forwarding will be more efficient especially considering the limited size of the mobile phone or PDA screens. As it is given that only 19% of mobile users has no pc connection in Europe, they are not able to use self interaction capabilities over internet. With the enhancement of broadband on mobile devices, the customers will be able to use wireless internet more efficiently to do their service configurations and inquiries by their own self without anyone's interruptions.

Table 5-31 Do you think that 3G will lead increase in usage of web and self service systems?

No answer	Strongly agree	Agree	Do not know	Disagree	Strongly disagree	stdev	kurtosis	skewness
16.67%	24.07%	48.15%	7.41%	3.70%	0.00%	17.76%	1.471503	1.285083

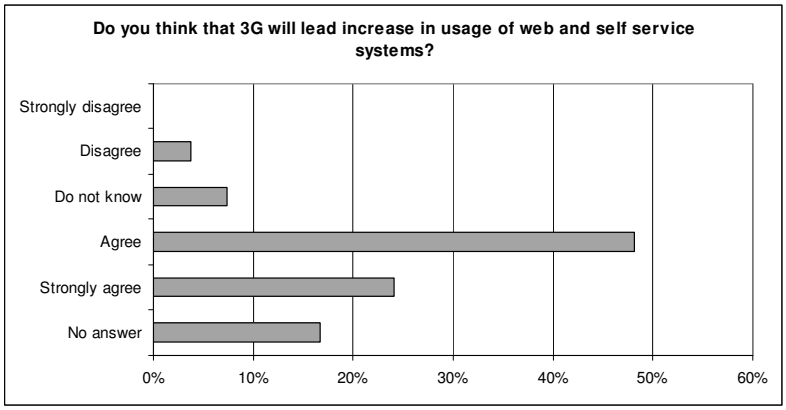


Figure 5-30 3G will increase use of self service systems

5.3.2.14.9 Internet

Internet is getting more an more important every they. It is cost efficient, visual, has powerful search capabilities, and has rich content. As the bandwidth will improve in whole world the demand to internet will increase and the investment will continue to grow. With the increase of number of applications, number of configuration capabilities, SLA

performance tracking, contract update, payment systems, credit management, eshopping, VPN and intranet configurations for corporate administrators and other capabilities will force internet content and functionality grow up for the 3G operators. Also increasing level of satisfaction break even point will make customers more demanding, they will look for instant chat, video conference support or at least call me functionalities.

5.3.3 Organization

As well as processes and strategy, telecom operators needs some adaptation in their organization to fulfill their requirements for 3G portfolio in terms of processes, tasks and customer experience. Basically this structure has three main drivers in terms of effects of 3G on CRM. Which are organizational structure and culture, employee profile, premium and incentive structure.

5.3.3.1 Organizational structure and culture

To compete within hiper competitive environment of 3G players companies need to implement customer retention and loyalty focused CRM business model to manage their relationships with the customer market in a more profitable way. To maintain that business objective companies should reengineer their organizational structure from product centric approach to customer centric approach. Product management concept evolves in to the customer segment management group where segment leaders or managers will determine the reflection of company image and offering to that segment according to segments needs and demands. As the segment managers will have the ultimate knowledge of certain customer segments they will coordinate the sales, marketing, application development and customer care functions to be able to serve in a way that customers will have the best experience and will maximize their life time values. This reengineering process requires a cultural change monitored by a well managed change management function. As every parties within the organization has a role in providing the value to the customer they must observe and understand that this is the most important non technological strength that they may have in the market. Not only within the company but also within the partner companies this objective must be communicated not only as an article on mission but a way of management in the market. As processes would be very important to deliver the services the processes must be monitored and managed by process leader to report issues, performance improvement opportunities and successes. Organization must be designed to

go in to the detail of one to one communication that if a customer requires specific attributes in applications and services, project based solution teams would be able to transfer their skills to enhance and vary the processes. This project teams must be indifferent from the internal project teams which will focused on companies' internal planned projects. This project teams must be ultimately focused on customer acquisition, development and support on one to one basis.

5.3.3.2 Employee profile

As it was mentioned above 3G may cause increase number of applications provided for customer, number of partners that provides applications for operators, more advanced services with more convergence capabilities and totally customer centric culture.

To be able to accomplish these channel employees must be able to deal with increased variety and number of issues and inquiries related with much more applications and alternatives to propose to the customers. They need to understand and manage the relationship to ensure customer is not confused with the alternatives. They must clear that the customer feels the trust to the company and feels that he or she is ultimately assisted in every issue. Also in analytic processes the increased number oh behavior parameters, scenarios, campaigns and performance criteria may require better analytical engineering capabilities and business knowledge. Increased number of global communications, partner integrations also requires better management in operational processes. All these capabilities require a solid background of knowledge for CRM process employees. To do that, recruitment of new employees and improvement of current skills of employees may be needed. As a result, asset value of the CRM personnel will improve significantly. Operators may need to improve their employee turnover rates to secure their human assets and may implement certain career management programs to improve it.

Definitely, these competition and technological competition will increase the demand on creativity and rapid campaign implementation skills for marketing functions. It will also require a company wide customer centric culture, more technical capabilities and better support skills.

5.3.3.3 Premium, incentive and motivators

CRM is not only technology nor processes it is also human touch and human psychology. It should take care of the personal drivers and motivators for each entity in the process such as employee, customer and dealers-partners. Money, recognition, career improvements are important motivators for partners and or dealers. As channel alignment and cross channel interaction and channel switching is available in customer relationship management, management of channel conflict gets more importance. As th competition grow up, the importance of customer acquisition is switched to customer loyalty and development. This also brings the importance or referrals. Each customer connection may not result with buy decision, but may play a role on it. If premiums and motivators depend on in which channel the buy decision is taken then the previous customer interactions that persuade customers to buy the product may be ignored. However they are important and plays a great role. Operators must be able to track these interactions and must find a better way to find the association in the buy decision in a clear and justified way as much as possible to motivate CSRs and communication channels not only for buy decision but also for persuasive interactions. Also for dealers incentives and premiums must be declared on a standardized ground that dealers may not be offended with unjustified profit margins and switch to other operators' dealer networks. Especially for outbound interaction from dealer, call center and account manager channels the primary channels to contact must be defined clearly to prevent overlaps and the decrease in the profitability of the channels, especially the dealers.

Finally profitability, incentives and premiums must not be the only motivators to implement loyalty based customer relations, on the other hand operators must work on better motivators then employee of the month that which actually provides benefit to their employees and dealers.

5.3.4 Aesthetics

Aesthetics is one of the most important part of the customer relationship management, whereas it does not discussed or considered as a driver in many CRM implementations. Basically, aesthetics must be in conformance with brand image of the company. The channels must not only satisfy the processes and not only communicate the message it self but they also communicate the peripheral of the message, form and the style which have psychological effects on buying decision. As 3G communication capabilities change the

way that message is communicating and change the portfolio of senses that message is able to reach to, the aesthetic of the interactions must also be considered to be align with the brand image. The way dealer shops' insides are decorated, the attitude of the employees (account managers, sales engineers, dealer employees, clerks, support personnel, i.e.) , the style of logos and materials used, the wireless and wireline internet content layout, form of the products and services in terms of touch and feel, the background of the call center in video calls, the vans used by field supports, snacks served in marketing events, the freshness of air in the retail shops are all important as they are a part of communication. All visual, auditory, tactile, gustatory and olfactory interactions must be managed to secure the brand asset that the brand is an important loyalty asset which is very important in competitive markets.

5.3.5 Technology

Technology is the fifth of the most important drivers of CRM. It is normally defined under three classifications which are collaborative, analytical and operational. Impact of 3G will be realized on all of these sub classification.

5.3.5.1 Collaborative

3G will enhance the channel capabilities in terms of communication dimensions (sound, sight – gesture, i.e), integration and availability. It will improve the coverage of self service channels. It will also enable video, content and voice integrations. Single view of customer on all channels with related customer profiling information and history records will be important. Conference call capabilities will help customer to interact with more then one CSR in complex inquiries.

As communication technologies will enhance, customers expectations will also enhance by time and level of satisfaction will increase. According to questionnaire results, participants of the questionnaire think that after the implementation of 3G services, customer will expect higher quality of customer care.

Table 5-32 Do you think that customers will expect higher quality in customer care services after the implementation of 3G services?

No answer	Strongly agree	Agree	Do not know	Disagree	Strongly disagree	stdev	kurtosis	skewness
12.96%	22.22%	44.44%	11.11%	9.26%	0.00%	15.36%	2.271076	1.353154

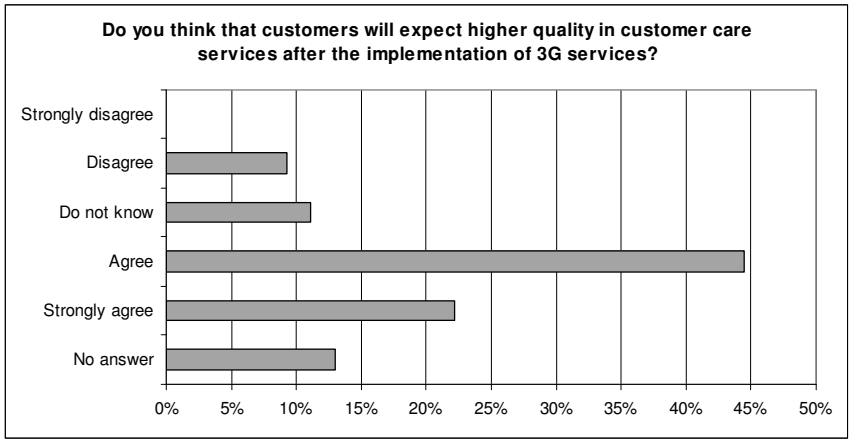


Figure 5-31 Questionnaire Results: Customers may ask for higher QoS

Customers are very demanding, and they think that technology has already solved lots of problems. They expect customer care operations and channels to be fully integrated with each other, they expect to see same feel and touch in every customer touch point. They want to be able to reach, when, where, how and whom ever they want. They want their operator to know them, to identify and recognize their value to the company and never under estimate them in any interaction. They want to receive personalized offerings that meet their requirements and also customize the offerings as they want to. They want to switch between medias and channels as they prefer different medias and channels for different purposes. They prefer different interaction methods according to the day of the time, time of the week, week of the month, month of the year and their current locations. They want the have preferences for their confidentiality, and to be asked for permission before sending promotions.

All these requests and wishes needs different capabilities, mostly not only one product is capable of doing them. That's why the operators may need to implement multiple collaborative systems to manage customer relationships and may need to integrate them accordingly.

5.3.5.2 Operational

3G will have a deep impact on operational CRM as 3G mobile operators may have many partners and applications to integrate with. Integrations of applications may need functional integration on applications such as transactions, content and other data flow. But these integrations will also require other aspects as billing of the provided service, tracking of

customer orders and history, customer support and care integrations to track issues, inventory and capacity tracking and planning for the partner systems, cost calculations of the systems, service level quality and performance assessment information flows, available network capacity information to support the application in operators network and etc. Partner relations management, quality management, customer support, order management, workflow, campaign management modules may be the ones which will affected mostly in these integrations. Content aggregation, billing integration and transaction integrations will be most vital for new processes. As these integrations will be supported in complex partnership structures and as they also affect the capabilities of CRM processes directly, (For example, billing capabilities are limitations for campaign design since a campaign may not be realize if the billing systems will not support it.) good integration tools, standardizations and skills will be very effective. Operators may declare and dictate their integration standards to partners for integration. They may use enhanced mediation interfaces, transaction servers, ETL and message broker applications to effectively manage the integrations. Workflow enabled versions of such systems may help operator integration teams to design and implement integrations more rapidly. Basically the integrations will be established between mobile operators billing and collection systems, switches, ERP systems (HR, account receivables, account payables, cash management, order management, demand planning, inventory, supply chain and distribution – module name classifications depend to software provider), trouble ticketing systems, network order management systems, network planning systems, workflow and alert systems, data warehouses, legal systems and CRM systems (campaign management, customer care systems, web, wap and other collaborative platforms, sales management, field sales management, partner management, quality management, and other modules – module name classifications depend to software provider).

Moreover because of the increased number of offerings and applications in 3G environment, there would be more tools to personalize offerings according to customer needs. This personalization will be done in terms of micro segmentation to one to one marketing-promotion. They will increase the number of campaigns, and the their communication channels. As the micro segmenting will be more valuable, mass media communication channels for campaigns may be less effective. And the customers may confuse because of the number of offerings. The wireless web and push type content may

be more efficient especially for loyalty and customer development objectives. Also as the number of campaigns is increased, the life cycle of campaigns and their available marketing resources will be decreased. Operators will want more efficient campaign management tools to be able to implement their campaigns rapidly and effectively and to be able to track their performance on time, and to be able to live update their campaign for changing business conditions. They must also be integrated with dealer and channel employee support systems to make sure that channels are trained well for each new campaign.

5.3.5.3 Analytic

Increased number of offers, tracking more data about the customer behaviors, more campaigns to be analyzed, micro segmenting and individual customer focused approach will require total enhancement in analytic tools which will clarify the differences between customers, offers and the campaigns effectively in terms of prediction models and clusters. To implement such enhanced systems most of the information systems data will be merged in one unique data warehouse, “the truth”. As most of the transactional systems will be integrated in to the data warehouse, the modeling processes, data mining, query performance and integration (extract - transfer - load (ETL)) management and tools would be very important in terms of success in analytic CRM. These enhanced tools will also require skills upgrade in terms of business, process and technological aspects for data mining and data warehouse system engineers.

For segmentation and modeling time based behavioral models, association models and enhanced systems such as neural networks, fuzzy modeling, partial least square estimation, integrated logistic and linear regression will be important. In terms of rapid and effective modeling; workflow based systems, lift charts, and scoring algorithm generators will also be effective to deploy.

According to questionnaire participants, over 75% of participants agree that after the implementation of 3G services market intelligence will be much more important then before.

Table 5-33 Do you think market intelligence will be much more important by the implementation of 3G services?

No answer	Strongly agree	Agree	Do not know	Disagree	Strongly disagree	stdev	kurtosis	skewness
14.81%	14.81%	62.96%	5.56%	1.85%	0.00%	23.54%	4.541145	2.068743

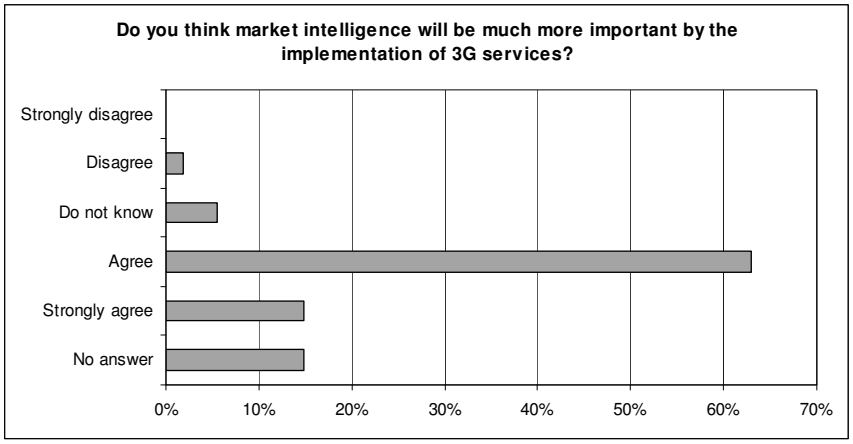


Figure 5-32 Questionnaire Results: Market Intelligence will be very Important

Operator who has implemented especially credit enabler and retail business models may need to deploy advanced fraud management capabilities to be able to response to new requirements of the processes. Also SLA needs very detailed data integration and analysis to understand the promised performance to actualized performance differences and to refund or bill customers accordingly.

Moreover MNO have already started to face high levels of customer churn and the lack of intelligence on customers' usage patterns. Churn is being exacerbated by trends such as shorter contract lifecycles (12 months instead of 24) and number portability, where a customer keeps their number when they switch to another operator. Customer intelligence currently focuses on aspects such as monthly spending, income and related factors, whereas lifestyle segmentation features will be important for data services. Also, a large portion of a typical operator's client base is prepaid or non-contract clients (typically between 65% and 80%) with even less information available about these clients, their needs and preferences. (Preeza and Pistoriusb, 2002) [183] This lack of intelligence will be the major hurdles for analytic CRM initiative to reach their goals.

6 FUTURE WORK

We have identified three potential development and further research areas as we have concluded our findings and results of applied evaluation and assessment methodology. These three future work recommendations are;

- New detailed CRM strategy evaluations template and performance indicators score card can be developed using the business model and CRM five driver frame work for customer relationship management strategy and performance evaluations of the wireless operators. The templates also can be modified for benchmark research and analysis purposes.
- Detailed cross industry researches can be done to identify the impact of aesthetics in CRM functions and applications.
- The framework approach can be used to apply similar researches in other industries to evaluate the future impact of changes in market, product and services. This research will also assist companies to reevaluate their strategies to strengthen their positioning within their customer's market.
- This framework approach can be applied on company basis and can be improved in order to support and develop company specific implementations. This simulation approach will also validate the applicability of the framework structure for the business life.

7 CONCLUSION

The drivers affecting to business models shows that, 3G will have impact on CRM in wireless telecommunications industry. It will create new business models such as Pure operator, network aggregator, retail, credit enabler, portal and ASP. It will also increase the number of MVNOs while the number telecom network operators will drop because of the merges and acquisitions within the industry. Because of the huge investment and the existing capacity in the short run, operators may have funding troubles and may act very cost focused. This will also lead them to focus on loyalty and retention rather then customer acquisition. Loyalty focused operators will be more competitive in the market.3G will increase the number of offerings and applications in the industry such as rich voice communication, intranet extranet connection, location based services, content aggregation services, community enablement services and mobile business enabling services. These new services and applications will be a better needs satisfier then existing 2G communications and also partially then 2.5G communications in terms of Maslow's hierarchy components especially, safety, belonging and esteem. It will also affect positively physiological and self actualization needs in some aspects. This will increase the demand on 3G services. 3G will also enable ease of internet communication with mobile handsets that as the numbers of mobile devices are much more then PCs, the total number of connected users will increase significantly and their availability will be improved revolutionary. This availability will introduce new applications for community and friend communication in terms of tools and processes. The better authentication mechanisms will enhance the personalization and customization capabilities, the multi media capabilities of mobile devices will also improved the communication capabilities and methodologies. Some of the operators will use availability and number of application as their strength in competition in the market that's why they will also look for availability not in domestic market but also the markets where its domestic market is interacting with, That's why they will choose the operators with high roaming connections for them and will established alliances and partnerships to be able to make their applications global for their users. Also they will partner with many solution providers, content providers and application providers to be able to give more diversified solutions according to the individual needs of their customers. This one to one marketing and service customization approach will increase the

competition and require better analytical modeling and information retrieval processes in terms of technology, organization and processes. To be able to fulfill requirements of 3G competitive markets companies are going to invest on data mining and data warehousing. As they have many partners and independent applications that produce information to integrating these applications and data systems would be considerably a good strength for capabilities for analytical, collaborative and operational point of view. Mobile operators may standardize majority of their integrations as they declare their integration standards earlier. Also the integration tools such as message brokers, transaction servers, data federation tools and ETLs will add power in terms of CRM technical capabilities as the data related with one single customer may be united in a single platform to understand his or her needs and expectations. To manage that level of offerings, campaigns and marketing should reengineer it self to be able to implement campaigns rapidly and cost efficiently. Because, the number of campaigns per year, will be probably increased by the micro segmenting and by the increased numbers of offerings in he market.

CRM strategy and vision should be reviewed to cover new loyalty focus and its culture through out the company. Partners and employees must agree on these basics. Partner management should be reengineered to establish strong alliance and partnerships. Channel alignment, switching between medias and tracking the customer history must be integrated in all channels. These alignments must not be established only for technical and process capabilities but also in terms of aesthetics and organizational structure. The operators must not disregard that in every customer interaction in act they are also communicating in terms of their brand image and they are in fact improving or destroying their brand image. Improved channel communication techniques must be considered to be reengineered in terms of permission marketing especially for push type content. The probability of switching call centers to video call centers is another capability to be discussed with call center infrastructure vendors. The implementation of this capability may increment customer satisfaction substantially.

Organizational change also requires improvement of employee, dealer and partner skills in terms of communication, technical and business. Mobile operators will implement knowledge bases, online training platforms, training courses and documentation for the improvement of their human portfolio. In some cases they may need to interact with recruitment markets to introduce brand new capabilities. Especially outsourced customer

care operations must be considered in terms of strategy, process, technology, organization and aesthetics to improve customer experience. In marketing and customer care operations premium, incentive and other motivators must be reengineered not only for customer acquisition but also good interaction and or referral. Moreover customer must be owned by segment leaders who are concentrated on needs on specific customer group and establishes required offerings portfolios, campaigns, plans and other experience improvement factors. Besides, customer focused project teams must concentrate on certain specific requirements of individual customers to diversify the service provided.

The new business model such as ASP, retail and credit enabler requires new processes to deliver their core business. Especially for retail and credit enabler processes wireless promotions, pos integration and financial integrations may require important role. Fraud management capabilities may also need to be enhanced in order to cope with the increasing risks of these new business models, if an operator wants to support to.

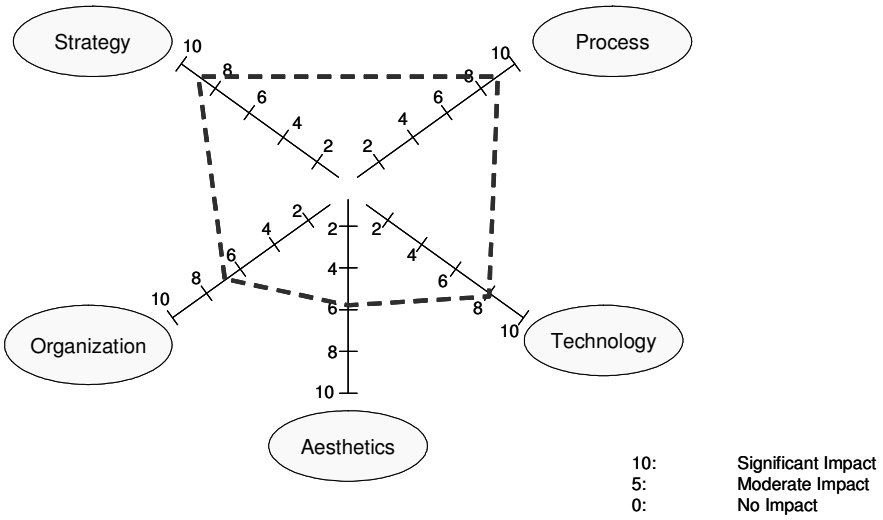


Figure 7-1 General 3G Technology Impact on CRM in Telecommunications Industry

In conclusion as 3G will implemented the CRM will raise its importance in terms of strategy, technology, organization, process and aesthetics. In the above figure a generic estimation is presented as a visual representation of the degree of impact. Mobile operators must focus on individual communication and relationship with their customers. The improvement process will not end as the innovation will continue in the market. After 3G, 4G (up to 100 Mbps bandwidth) is expected to be implemented by 2010. Many operators are now working on how to transfer touch feeling (tactile senses) with their mobile devices.

As this improvement will not end companies will need to implement continuous quality improvement process approaches in their customer relationship management processes such as Deming's PDCA. In fact they have already using this cyclic approach within many CRM processes but with different step names. As customers will keep demanding more and more the level of service and customer interaction quality must also be raised continuously.

APPENDIX: I HISTORY OF COMMUNICATIONS

In 1946, AT&T created the Improved Mobile Telephone Service (IMTS), the first mobile radio system to connect with the regular public phone network. With advances in computer-based switching and electronic component miniaturization, as well as major innovations in battery technology work on the cellular radio model began taking shape. A cellular model evolved that relied on a grid of single, low-powered mobile transceivers (combined transmitter and receiver units) that serviced a fixed, limited geographic area and switched from one cell to the next in order to follow the mobile customer. By 1973, Motorola demonstrated a mobile phone, about the size of a modern desktop PC, which worked with a network developed by AT&T. Five years later; the FCC authorized two experimental cellular licenses, one to AT&T and one to Motorola. In 1979 First cellular phone communication network started in Japan.

Because competition for licenses was so fierce, the FCC announced a lottery for cellular licenses in 1983. In the same year, first cellular phone network started in the United States. In 1985 Cellular telephones in cars become wide-spread. In 1986 a completely new system for UMTS (IMT-2000 - International Mobile Telephony) was designed initially, that promising faster communications services, including voice, fax, data and multimedia communications. In 1998, mobile internet was implemented in Finland. In 2000, the ITU defined the standards of 3G (IMT-2000). The first 3G networks were deployed in Korea and Japan in 2000 and 2001. 2.5G networks, such as GPRS (Global Packet Radio Service) were already available in some parts of Europe. Finally, In January 2003 NTT DoCoMo executed first open air tests of 4^{th} Generation wireless services which has the capacity of upto 100Mbs and is planning to be implemented by NTT DoCoMo by 2010. (Bergeron, 2001)

APPENDIX: II BASICS OF TELECOMMUNICATION

Appendix: II.I What is Telecommunications?

The word is derived from the Greek “tele”, "far off," and the Latin “communicare”, "to share." According to Pecar and Garbin (Telecom Fact Book) Communications is the process of representing, transferring, interpreting, or processing information (data) among persons, places, or machines. The process implies a sender, a receiver, and a transmission medium over which the information flows. It is important that the meaning assigned to data be recoverable without degradation.

More specifically, telecommunications is any process that enables one or more users (people or machines) to pass to one or more other users information of any nature delivered in any usable form by wire, radio, visual, or other electrical, electromagnetic, optical, acoustic, or mechanical means.

Appendix: II.II Telecom Services & Facilities

A telecommunications service is a specified set of information transfer, and information transfer supporting, capabilities delivered to a group of users by a telecommunications system. Generally telecommunications services are summarized in three major groups which are voice services, data services and wireless services.

It is necessary to distinguish between telecommunications services and the telecommunications systems/networks/equipment/components (facilities) by which the services are delivered. As a person may explain his thoughts by writing books, writing articles, drawing pictures, cutting sculptures or giving speeches, a certain telecommunication service can be provided by installing different combinations of communication equipments and technologies such as satellite, fiber, cable or PSTN.

Communication equipment can be classified in various aspects such as wire-line and wireless or fiber, cable, radio and PSTN. Another classification is the size of the network. Local network, national network and international network are the basic classifications in terms of the size. This classification also identifies the difference between local access and transmission.

The basic difficulty in classification of telecom services or facilities is the convergence of services or the platforms. For example, whereas services are classified in voice, wireless and data; in fact wireless services are also providing data and voice services.

Urgency of the information to be delivered can also be used for classification purposes. The basic distinction between these services can be explained by the difference between voice communication and music listening. For voice communications real time streamline communication is preferred for better quality of service, but music can be downloaded in advance and it can be listened occasionally. It does not require real time communication since there is no interaction with a third party.

Table A-7-1 Classification of Communication Services

Classification of Services	Classification of Facilities			
	Hierarchy of Network	**Network Components**	**Physical properties of Network**	**Type of Network**
• Voice services • Data Services • Wireless services	• Local Network • National Network • International Network	• Switching systems • Transmission systems • Station equipment	• Fiber Optics • Wireless Optics • Radio Signals • PSTN/Copper Wire • Cable	• Circuit Switched Networks • Packaged Switch Networks • Mobile Subscriber Networks

Appendix: II.III Access Technologies in Mobile Communications

The cellular concept originated at Bell Laboratories in 1947 and implemented first in Japan in 1979. This concept is used by all mobile radio systems including Personal Communication Systems (PCS) and Personal Communications Network (PCN) systems which operate at higher frequency bands.

A single cellular system interconnects many small radio coverage areas (called "cells") to serve hundreds of square miles. Radio frequencies in cellular systems are reused in distant cells, and telephone calls are automatically switched between neighboring cell sites when the wireless telephone moves from one cell to other. Neighboring cellular systems often allow customers from other cellular systems to use their services, which is called roaming.

Cellular systems take advantage of frequency reuse by breaking the coverage area into many small cells. Each cell site base station can simultaneously transmit on several different radio channel frequencies or codes. Adjacent cells use different frequencies or codes to avoid interference. Widely separated cells can reuse the same frequencies or codes without interference. This allows the system to reuse radio channels and increase the number of subscribers it can serve. The amount of geographic radio coverage area for each cell is determined by the base station's transmitter power. Lowering power decreases the coverage area.

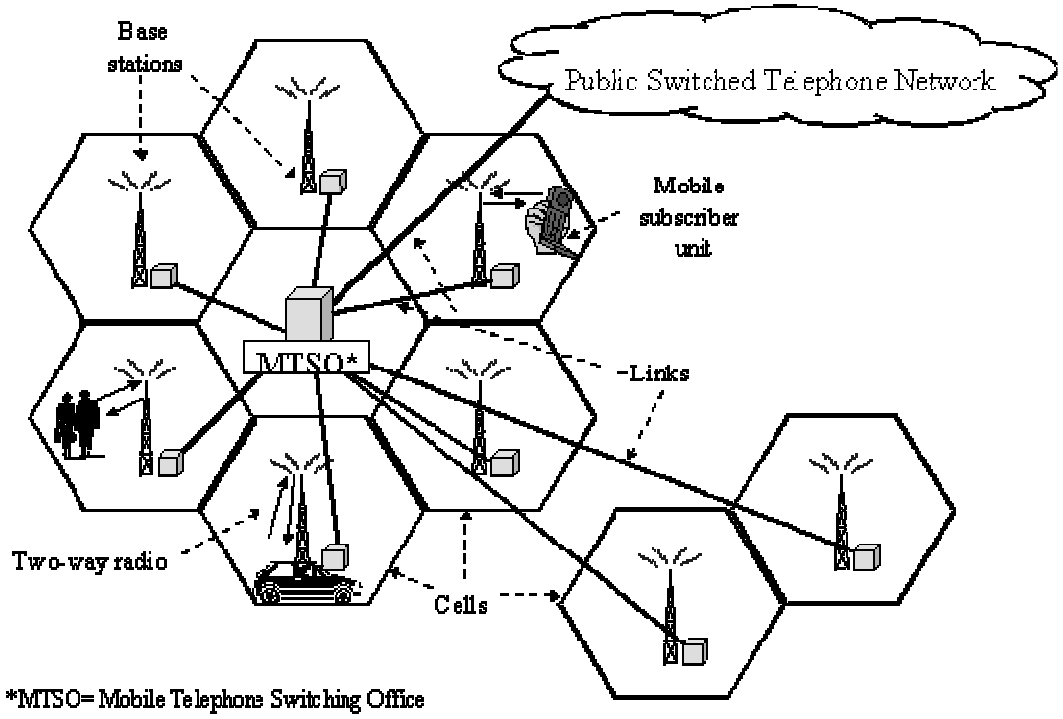


Figure A-1 Basic Cellular Structure (ITU, 2003)

Appendix: II.III.I FDMA

Frequency Division Multiple Access (FDMA) is the most common analog system. It is a technique where spectrum is divided up into frequencies and then assigned to users. With FDMA, only one subscriber at any given time is assigned to a channel. The channel therefore is closed to other conversations until the initial call is finished, or until it is handed off to a different channel. A "full-duplex" FDMA transmission requires two channels, one for transmitting and the other for receiving. FDMA has been used for first generation analog systems.

Appendix: II.III.II TDMA

Time Division Multiple Access (TDMA) improves spectrum capacity by splitting each frequency into time slots. TDMA allows each user to access the entire radio frequency channel for the short period of a call. Other users share this same frequency channel at different time slots. The base station continually switches from user to user on the channel. TDMA is the dominant technology for the second generation mobile cellular networks.

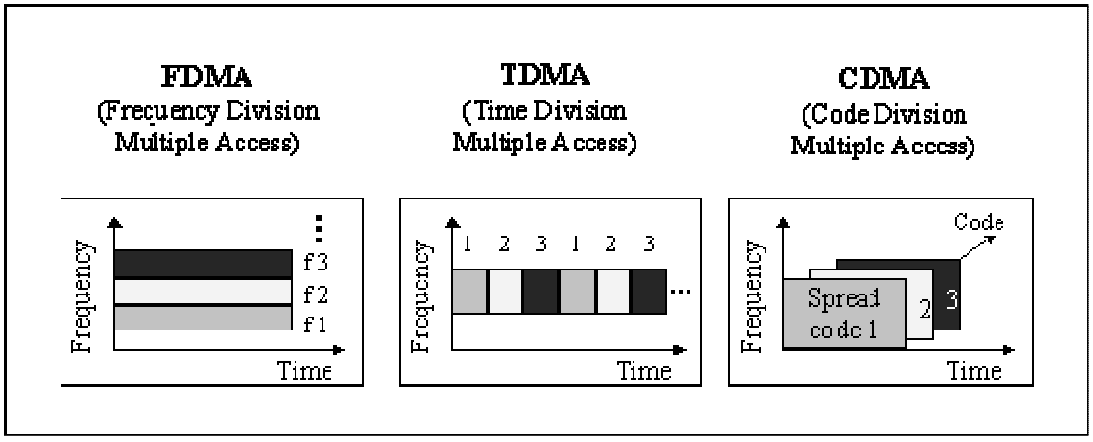


Figure A-2 Wireless Access Methodologies (ITU, 2003)

Appendix: II.III.III CDMA

Code Division Multiple Access is based on "spread" spectrum technology. Since it is suitable for encrypted transmissions, it has long been used for military purposes. CDMA increases spectrum capacity by allowing all users to occupy all channels at the same time. Transmissions are spread over the whole radio band, and each voice or data call are assigned a unique code to differentiate from the other calls carried over the same spectrum. CDMA allows for a "soft hand off", which means that terminals can communicate with several base stations at the same time. The dominant radio interface for third-generation

mobile, or IMT-2000, will be a wideband version of CDMA with three modes; IMT-DS, IMT-MC and IMT-TC. (ITU, 2003)

Appendix: II.IV Generations of Mobile Communication

Since 1940s mobile communications evolved by time and increased its capabilities. Basically this cellular mobile evolution is currently classified in 3 generation. The basic technological information about these 3 generations are summarized below. In the near future a 4th generation concept is expected to join this classification with superior data transmission capabilities (up to 100Mbs.). The table given below is representing the major services and their capabilities related with this 3 generations.

Table A-2 Cellular Mobile Telephone Systems (Pecar and Garbin, 2000)

	System								
Parameter	**AMPS**	**MCS-L1/L2**	**NMT**	**C450**	**TACS**	**D-AMPS / IS-54 / IS-136**	**PCS**	**GSM**	**IS-95**
Transmit Frequency (Mhz)									
Base	869-894	870-885	935-960	461-466	935-960	869-894		935-960	869-894
Mobile	824-849	925-940	890-915	451-456	890-915	824-849		890-915	824-849
Multiple Access Method	FDMA	FDMA	FDMA	FDMA	FDMA	TDMA / FDMA	TDMA	TDMA	CDMA
Channel Bandwidth (Khz)	30	25-12.5	12.5	20-10	25	30	200	200	1500
Traffic	1	1	1	1	1	3	16	8	55

Channels per RF Channel									
Total Number of Traffic Channels	832	600-1200	1999	222	1000	832*3	375*16	125*8	-
Voice Format/Encoding	Analog	Analog	Analog	Analog	Analog	VSELP	RELP	RELP	QCELP
RF Modulation									
Control Channel	Digital FSK	Digital FSK	Digital FSK	Digital FSK	Digital FSK	Digital PSK	Digital GMSK	Digital GMSK	Digital PSK
Voice Channel	Analog FM	Analog FM	Analog FM	Analog FM	Analog FM	Digital PSK	Digital GMSK	Digital GMSK	Digital PSK

Appendix: II.IV.I First generation cellular

First generation analog cellular systems were actually a hybrid of analog voice channels and digital control channels. Analog cellular systems can send digital messages and provide advanced services such as short messaging. However, these messaging services are usually limited to very slow data rates, and new features generally require hardware changes to both the mobile telephones and cellular networks.

The limited digital signaling rates and the transmission of complex analog voice signals limit the ability of analog systems to offer advanced authentication techniques and voice encryption services. Most of the 1G analog phones, only have processing capability of about 500,000 instructions per second. In 2G digital phones this capability reaches to 10 million to 40 million instructions per second (MIPS). Because of this lack of capability, 1G systems were not able to process advanced security procedures or voice encryption.

Appendix: II.IV.II Second generation cellular and PCS/PCN

Second generation digital systems use digital radio channels for both voice (digital voice) and digital control channels. 2G digital systems typically use more efficient modulation technologies, including global system for mobile communications (GSM), IS-95 code division multiple access (CDMA), and IS-136 time division multiple access (TDMA).

2G systems use multiple access technologies to allow more customers to share individual radio channels or use narrow channels to allow more radio channels into a limited amount of radio spectrum band. There are three basic types of access technologies used in 2G systems: FDMA, TDMA and CDMA.

Because of the fact that digital systems use a common data communication channel, advanced features can be added more easily in 2G communications. All 2G systems have improved authentication and voice privacy capability which reduces the fraudulent use and unauthorized recording of private conversations.

Appendix: II.IV.III Enhanced 2nd generation digital cellular and PCSIPCN (2.5G)

2.5G is a term that is commonly used to describe enhancements to 2nd generation cellular and PCS/PCN technologies that provide significantly new and improved capabilities. The 2.5G systems use improved digital radio technology to increase their data transmission rates and new packet-based technology to increase the system efficiency for data users. Some of these needs included high-speed data transmission service, efficient packet data transmission, and more efficient radio channel capacity through the use of new modulation technology.

Appendix: II.IV.IV Third generation requirements

In the early 1990s, the success of 2G digital cellular and PCS/PCN systems (dramatic growth in the number of customers) led to demand for new features and more efficient services. It became apparent that robust high capacity and lower-cost wireless systems were needed to better service customers that 2nd generation systems could not easily provide. To satisfy these needs, a new 3rd generation wireless system was needed.

The 3rd generation system is called universal mobile telecommunications system (UMTS). In 1993, the world administrative radio conference (WARC) defined the frequency bands that would be used for 3rd generation systems. The ITU then defined new requirements for the 3rd generation systems. The original requirements for the 3rd generation system were defined in the international mobile telecommunications 2000 (IMT-2000) system. IMT-2000 key requirements included high-speed (broadband) data services, multimedia support (simultaneous voice and data), improved system efficiency (cost reduction), and backward compatibility with 2nd generation systems.

The creation of the UMTS system required the participation of many companies. Because the system specifications are global standards, the development of this system was performed with the cooperation of the leading standards committees of most countries. To help coordinate this process, a global committee was created called the Third Generation Partnership Program (3GPP). Some of the key standard groups that are part of the 3GPP include European Telecommunications Standards Institute (ETSI), Research Institute of Telecommunications Transmission (RITT) - China, Association of Radio Industry and Business (ARIB) - Japan, Telecommunications Technologies Association (TTA) - Korea; Telecommunications Industry Association (TIA) - United States.

The basic structure of the UMTS system provides high capacity communication service (up to 2 Mbps) for in-building users. In urban areas (pedestrian) may have access to medium capacity services (up to 384 kbps). For wide area, capacity is moderate (up to 144 kbps).

In 1996, when the third Generation system known as UMTS was being developed in the European Telecommunications Standards Institute (ETSI), the opportunity was taken to review the basis for security in existing mobile systems and to develop a new security architecture specifically to be used in UMTS. While developing the 3G security structure the following principle took in to consideration to leverage the security over 2G systems. According to that principle UMTS will, (Blanchard, 2000)

- take into account the additional features needed for actual or predicted change in the operating environment.
- maintain compatibility with GSM wherever possible.
- retain those features of GSM that have proved to be robust and useful to the user and network operator.
- and add or enhance features to overcome actual or perceived weaknesses in 2G system.

Appendix: II.IV.V Multimedia services

Multimedia is a term that is used to describe the delivery of different types of information such as voice, data, and video. Communication systems may deliver media services separately or simultaneously. Second generation systems were primarily limited to low-speed single channel (non simultaneous) communication. Third generation systems can

provide simultaneous channels with data rates up to 2 Mbps, and each of them can have a different quality of service (QoS) capability. For example, a 3G handset can be participating in a video conference call while downloading an email file from the Internet. The real time video clip requires a high-speed data transfer rate that needs to be real time but can tolerate errors, while the email file download can tolerate large delays but errors are not acceptable.

Appendix: II.IV.V.I Multi system compatibility

The multi-system compatibility of 3rd generation systems allows customers to roam globally (different frequency bands) and be able to hand off to 2nd generation systems (backward compatibility). It is possible for existing 2nd generation service providers to upgrade their systems to 3rd generation technology and to connect 2nd and 3rd generation systems together.

Appendix: II.IV.V.II Increased system efficiency

Third generation systems are expected to be more cost effective than 2nd generation systems. Third generation systems use the available radio spectrum more efficiently, and the implementation offers cost savings through the reduction of cell sites and equipment and simplified operational service support.

The number of subscribers who can share a cell site is much greater than the number of available radio channels but, because not everyone places calls at exactly the same time (except during traffic jams), many users can share a single radio channel. For analog systems that can allow only one conversation per radio channel, a typical analog system may add 20 to 32 customers to the system for each available voice/radio channel. If an analog cell site has 50 radio channels installed, this has enough capacity to serve about 1000 customers. Second generation digital technologies can multiply this number by 3 to 20 times. A single 2nd generation cell site can serve approximately 3,000 to 20,000 customers. Third generation UMTS systems increase the overall efficiency by 2 to 4 times compared to 2nd generation systems. This means if a 2nd generation cell site is completely converted to UMTS channels, that cell site can serve approximately 6,000 to 80,000 customers (Harte and Levine and Kikta, 2002).

Table A-3 Cell Site Capital Cost per Subscriber (Harte and Levine and Kikta, 2002)

	AMPS/ ETACS	NAMPS	IS-54/ IS-136 TDMA	IS-95 CDMA	GSM	WCDMA
Cost per RF Radio Channel (includes channel speech coders)	10,000	10,000	15,000	45,000	15,000	100,000
Number of radio Channels per Cell Site (3 sector), assume 12.5 MHz	51	153	51	24	30	9
Total Radio Channel Cost	510,000	1,530,000	765,000	1,080,000	450,000	900,000
Tower and Building Cost	285,000	285,000	285,000	285,000	285,000	285,000
Total Cell Site Cost	795,000	1,815,000	1,050,000	1,365,000	735,000	1,185,000
Number of Voice Paths per Radio Channel	1	1	3	20 (est.)	8	100
Number of Voice Paths per Cell Site	51	153	153	480	240	900
Number of Subscribers per Voice Channel	20	20	20	20	20	20
Number of Subscribers per Cell Site	1020	3,060	3,060	9,600	4,800	18,000
Cell Site Cost per Subscriber	$779	$593	$343	$142	$153	$66

Table shows the capital investment cost per subscriber per cell site, however to implement a new network is not only related with the cumulative capacity of all sites. It is also a function of the coverage area of the implemented network, such as to be able to be

preferred by the customers working in downtown , the services may also require to be deployed on the subscriber's way back to home and their residential area.

Appendix: II.IV.VI Third generation wireless access systems

Third generation wireless systems combine cellular, wireless office telephone systems, cordless telephone systems, and advanced intelligent features in to one portable device. In 2001, there were three different system specifications for 3rd generation wireless systems: wideband code division multiple access (WCDMA), time division CDMA (TD/CDMA), and CDMA2OOO.

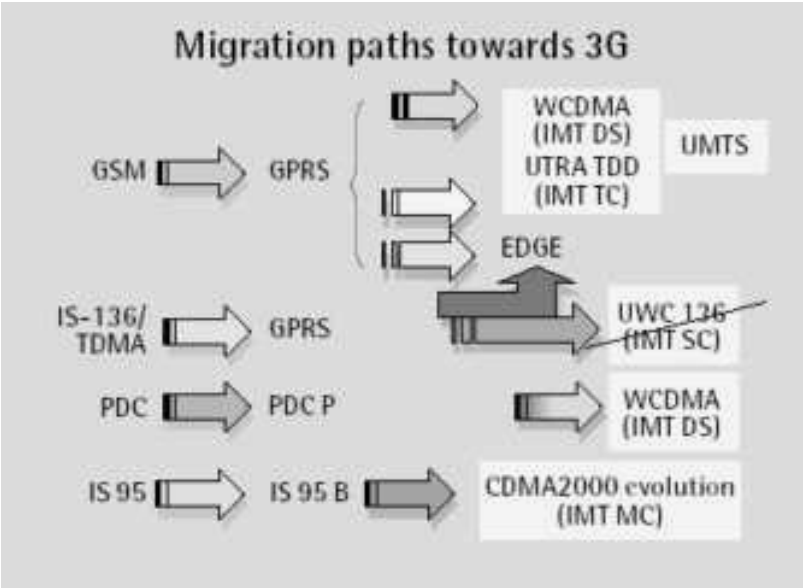


Figure A-3 Migration Paths towards 3G (UMTS Forum, 2003)

APPENDIX: III INDUSTRY ASSOCIATIONS

Below list of industry associations, which are referenced most commonly in the industry are summarized.

Telecommunications Industry Association (TIA)

The Telecommunications Industry Association (TIA) is the leading trade association serving the communications and information technology industry, with proven strengths in market development, trade shows, domestic and international advocacy, standards development and enabling e-business. Through its worldwide activities, the association facilitates business development opportunities and a competitive market environment. The association provides a market-focused forum for its 1,000 member companies that manufacture or supply the products and services used in global communications. TIA represents the communications sector of the Electronic Industries Alliance (EIA). (http://www.tiaonline.org)

GSM Association

Founded in 1987, the GSM Association has played a pivotal role in the development of the GSM platform and of the global wireless industry.

Since its introduction our members and staff have created the landscape of success for global mobile communications via GSM. Ours is a story of international cooperation and collaboration, between people, companies and governments to create the world's first global wireless network.

The GSM Association (GSMA) is a global trade association that represents the interests of more than 585 GSM mobile operators. The Association role is to promote, protect and enhance the interests of the global GSM mobile operator community – which currently provides GSM services to more than 850 million customers across 200 countries and regions around the world (71% of the world’s mobile market). In addition, some 132 key manufacturers and suppliers to the GSM industry are associate members of the GSM Association.

UMTS Forum

The UMTS Forum recognises the importance of all players - including new entrants - in the mobile value chain. As well as offering guidance to governmental and financial communities it also provides marketing input to technical standardisation bodies and advises on spectrum requirements both for the present and future 3G systems. The UMTS Forum serves the interests of all its members through educational and promotional activities in its role as the voice of the 3G mobile market.

Federal Communications Commission (FCC)

The Federal Communications Commission (FCC) is an independent United States government agency, directly responsible to Congress. The FCC was established by the Communications Act of 1934 and is charged with regulating interstate and international communications by radio, television, wire, satellite and cable.

The CDMA Development Group (CDG)

The CDMA Development Group (CDG), founded in December 1993, is an international consortium of companies who have joined together to lead the adoption and evolution of CDMA wireless systems around the world.

The CDG is comprised of the world's leading CDMA service providers and manufacturers. By working together, the members will help ensure interoperability among systems, while expediting the availability of CDMA technology to consumers.

3rd Generation Partnership Project (3GPP)

The 3rd Generation Partnership Project (3GPP) is a collaboration agreement that was established in December 1998. The collaboration agreement brings together a number of telecommunications standards bodies which are known as "Organizational Partners". The current Organizational Partners are ARIB, CCSA, ETSI, T1, TTA, and TTC.

The original scope of 3GPP was to produce globally applicable Technical Specifications and Technical Reports for a 3rd Generation Mobile System based on evolved GSM core networks and the radio access technologies that they support (i.e., Universal Terrestrial Radio Access (UTRA) both Frequency Division Duplex (FDD) and Time Division Duplex (TDD) modes). The scope was subsequently amended to include the maintenance and

development of the Global System for Mobile communication (GSM) Technical Specifications and Technical Reports including evolved radio access technologies (e.g. General Packet Radio Service (GPRS) and Enhanced Data rates for GSM Evolution (EDGE)).

Third Generation Partnership Project 2 (3GPP2)

Third Generation Partnership Project 2 (3GPP2) is a collaborative third generation (3G) telecommunications specifications-setting project, comprising North American and Asian interests developing global specifications for ANSI/TIA/EIA-41 Cellular Radiotelecommunication Intersystem Operations network evolution to 3G and global specifications for the radio transmission technologies (RTTs) supported by ANSI/TIA/EIA-41.

3GPP2 was born out of the International Telecommunication Union's (ITU) International Mobile Telecommunications "IMT-2000" initiative, covering high speed, broadband, and Internet Protocol (IP)-based mobile systems featuring network-to-network interconnection, feature/service transparency, global roaming and seamless services independent of location.

The European Telecommunications Standards Institute (ETSI)

ETSI (the European Telecommunications Standards Institute) is a not for profit organization whose mission is to produce the telecommunications standards that will be used for decades to come throughout Europe and beyond.

ETSI unites 699 members from 55 countries inside and outside Europe, and represents administrations, network operators, manufacturers, service providers, research bodies and users. The Institute's work program is determined by its members, who are also responsible for approving its deliverables.

Wireless World Research Forum (WWRF)

The objective of the new forum is to formulate visions on strategic future research directions in the wireless field, among industry and academia, and to generate, identify, and promote research areas and technical trends for mobile and wireless system technologies. It is intended to constructively contribute to the work done within the UMTS Forum, ETSI,

3GPP, IETF, ITU, and other relevant bodies regarding commercial and standardization issues derived from the research work.

China Wireless Telecommunication Standard group (CWTS)

China Wireless Telecommunication Standard group (CWTS) is a non-profit making organization, which has the responsibility to define, produce and maintain Chinese wireless telecommunication standards in China.

CWTS is established under the Chinese Standardization Law, with the approval of Ministry of Information Industry (MII) of China, CWTS is set up with the purpose of promoting and accelerating wireless telecommunication standardization process in China. Its objective is to meet the requirement for rapid development of wireless industry in China.

Association of Radio Industries and Businesses (ARIB)

The Association of Radio Industries and Businesses (ARIB) was chartered by the Minister of Posts and Tele-communications as a public service corporation on May 15, 1995. Its activities include those previously performed by the Research and Development Center for Radio Systems (RCR) and Broadcasting Technology Association (BTA).

ARIB was established in response to several trends such as the growing internationalization of telecommunications, the convergence of telecommunications and broadcasting, and the need for promotion of radio-related industries. ARIB's goal is to advance rapidly the use of radio technology for the benefit of society.

(ITU)

The ITU, headquartered in Geneva, Switzerland is an international organization within the United Nations System where governments and the private sector coordinate global telecom networks and services. It was first established in 1865, by the 20 founding members as the International Telegraph Union (ITU). By time it adapted to the changing technology and business requirements and it became International Telecommunication Union.

USTA

USTA is the premier trade association representing service providers and suppliers for the telecom industry. USTA's 1,200 member companies offer a wide range of services, including local exchange, long distance, wireless, Internet and cable television service. As the voice of the converged telecommunications industry in Washington, USTA advocates for the industry's critical issues before Congress, regulators, the courts, the White House and the media.

TeleManagement Forum

The TeleManagement Forum is an international non-profit organization serving the information services and communications industry. Its mission is to help service providers and network operators automate their business processes in a cost and time effective way. The members of TM Forum include service providers, network operators and suppliers of equipment and software to the information services and communications industry.

APPENDIX: IV GLOSSARY

2.5G: Second-generation enhanced. Name given to enhanced 2G networks, for example GPRS and cdmaOne.

2G: Second-generation mobile network orservice. Generic name for second generation networks, for example GSM.

3G: Third-generation mobile network or service. Generic name for third-generation networks or services under the IMT-2000 banner, for example W-CDMA.

3GPP: Third Generation Partnership Project. A cooperation between regional standards bodies to ensure global interworking for 3G systems.

Access charge: Amount paid per minute, charged by network operators for the use of their network by other network operators.

ACD (Automated Call Distribution): A specialized phone system that handles many incoming calls. ACD is used for a variety of order taking functions, such as call to help desks or dispatching of service technicians. It is designed to distribute a large volume of incoming calls uniformly to a number of operators or agents, e.g., for airline reservations.

Air time: The minutes of calls a subscriber makes from a mobile phone. Also referred to as talk time.

AMPS: Advanced Mobile Phone System. An analogue cellular telephone service standard utilizing the 800 to 900 MHz band (and recently also the 1’800-2'000 MHz band).

Analogue: Transmission of voice and images using electrical signals. Analogue mobile cellular systems include AMPS, NMT and TACS.

Analytical CRM: Focused on capturing and evaluating data, flowing from the interaction channels, front office and back office operations in order to make comprehensive analysis. It enables functions such as: Customer profiling, Campaign management, Customer management, Customer loyalty, sales data analysis, customer focused performance indicator tracking.

Application Integration Partners: The companies that provide the following services: Design and implementation of new facilities/systems, upgrade of existing facilities/systems, consolidation of facilities, networking of disparately located

facilities/systems, design and implementation of computer telephony middleware solutions, installation of and training on front-office software applications, design and implementation of online customer care functionality and systems, development of warehousing/data mining systems, networking and connectivity with ERP systems, and others.

ARPU: Average Revenue Per User. Usually expressed per month but also per year.

ASP (Application Service Provider): The ASP companies invest for all the software and hardware technology. Their clients pay them monthly to use their systems via remote access. The clients' benefit is that they do not need to invest and ASP company uses scale economy in this business model.

ATM: Asynchronous Transfer Mode. A transmission mode in which the information is organized into cells; it is asynchronous in the sense that the recurrence of cells from an individual user is not necessarly periodic.

B2B: Business to Business. Term used to identify a business-to-business transaction.

B2C: Business to Consumer. Term used to identify a business-to-consumer transaction.

Back-office: All of the applications used during the Order-to-Cash and Purchase-to-Pay process. The logistic and financial dimension of orders got through back-office systems.

Bandwidth: The range of frequencies available to be occupied by signals. In analogue systems it is measured in terms of Hertz (Hz) and in digital systems in bit/s per second (bit/s). The higher the bandwidth, the greater the amount of information that can be transmitted in a given time. High bandwidth channels are referred to as broadband which typically means 1.5/2.0 Mbit/s or higher.

Base station: A radio transmitter/receiver and antenna used in the mobile cellular network. It maintains communications with cellular telephones within a given cell and transfers mobile traffic to other base stations and the fixed telephone network.

Best-of-breed CRM Applications: Best-of-breed applications are characterized by niche players specialized in selling, marketing, or servicing or totally different such as collaborative CRM.

Bit (binary digit): A bit is the primary unit of electronic, digital data. Written in base-2, binary language as a "1" or a "0".

Bit/s: Bits per second. Measurement of the transmission speed of units of data (bits) over a network.

Bluetooth TM: Short-range radio link standard. Uses unlicensed spectrum @ 2.45 GHz to provide 1 Mbit/s.

Bluetooth: A radio technology that makes possible transmitting signals over short distances between mobile phones, computers and other devices.

BOT: Build-operate-transfer. See BTO.

Broadband: Although there exist various definitions of broadband that have assigned a minimum data rate to the term, it may be defined as transmission capacity with sufficient bandwidth to permit combined provision of voice, data and video, typically at speeds over 2 Mbit/s.

BTO: Build-transfer-operate. An agreement whereby a client awards a contract for the development of a particular network but, instead of paying for it outright, allows the contractor to operate the network and collect revenues from it after transferring ownership. There are many variations on this, depending on when the transfer of ownership takes place, such as build-operate transfer (BOT).

Byte: (1) A set of bits that represent a single character. A byte is composed of 8 bits. (2) A bit string that is operated upon as a unit and the size of which is independent of redundancy or framing techniques.

Byte: (1) A set of bits that represent a single character. A byte is composed of 8 bits. (2) A bit string that is operated upon as a unit and the size of which is independent of redundancy or framing techniques.

C450: Nordic-1

Cable modem: A technology that allows high speed interactive services, including Internet, to be delivered over a cable TV network.

CAGR: Compound Annual Growth Rate. See technical notes.

Call Center: The part of an organization that handles inbound/outbound communications with customers.

Campaign Management: Campaign management enables an organization to generate campaigns based on customer data and list management tools.

Category Management: Processes, services and applications used to allow electronic catalog creation and updating in an e-commerce environment.

CDMA: Code Division Multiple Access. A technology for digital transmission of radio signals based on spread spectrum techniques where each voice or data call uses the whole radio band and is assigned a unique code.

CDMA2000: A third-generation digital cellular standard based on Qualcomm technology. Includes CDMA2000 1x. One of the IMT-2000 "family" of standards.

cdmaOne: 2.5G mobile cellular standard (IS-95B) based on CDMA and backed by Qualcomm. The evolution continues with the 3G standard, CDMA2000. The 2G standard is known as IS-95A.

Cell: The geographic area covered by a single base station in a cellular mobile network.

Cellular: A mobile telephone service provided by a network of base stations, each of which covers one geographic cell within the total cellular system service area.

Channel: One of a number of discrete frequency ranges utilized by a base station to transmit and receive information from cellular terminals (such as mobile handsets).

Churn Rate: A term that describes customer attrition, or customer defection. A high churn rate implies high customer disloyalty. This term is highly used in telecommunications industry.

Churn: Term used to describe the turnover in the number of subscribers to a network, typically measured monthly. There are several different ways of measuring churn (for instance, based on the subscriber base at the start or the end of the month) which means that comparisons between companies or between countries are not always meaningful.

Circuit transfer mode: A transfer mode in which transmission and switching functions are achieved by permanent or quasi-permanent allocation of channels, bandwidth or codes between identified points of a connection. See also Packet transfer mode.

Circuit-switched connection: A temporary connection that is established on request between two or more stations in order to allow the exclusive use of that connection until it is released.

Claims Management: In some industries all the service requests and claims should be entered, stored and handled periodically. Customers are treated based on their claims history.

Collaborative CRM: Focused on management of all interaction channels including optimization, real time synchronization and arrangement of them according to the customer preferences. Collaborative CRM includes the following functions: Collaborative Content Management, One step buy side & sell side integration, Integration into Marketplace.

Connectivity: The capability to provide, to end users, connections to the Internet or other communication networks.

Contact Center: Any technology tool for supporting customers to reach the company via any channel, such as call center, e-mail center, web site, wap center

Coverage: Refers to the range of a mobile cellular network, measured in terms of geographic coverage (the percentage of the territorial area covered by mobile cellular) or population coverage (the percentage of the population within range of a mobile cellular network).

CPP: Calling party pays. Billing option typically used in mobile networks whereby the person making the call is charged for its full cost, in contrast to billing also the recipient of the call (see RPP).

CRM Strategy Implementation – Process Design & Re-engineering: Defining the design of new process and the redesign of existing ones according to the pre-defined CRM strategy needs.

CRM Strategy Implementation – Solution Environment Implementation: Using a total enabler-set of services composed of consulting, systems integration, outsourcing and training in order to design, build and operate CRM strategy established on CRM solution environments.

CRM Strategy Implementation – Solution Environment: Defining the solution environment that best meets the requirements identified in the Process Design & Re-engineering

CRM Strategy: Defining how to initiate customer focused reorganization/ operations and how a client will relate to its customers in the future with regard to competition in sales, marketing and service across various access channels.

CRM Suite: CRM full product suites are commonly referred to as "front office" solutions. The "front office" concept roughly maps to what the Gartner Group refers to as the Technology-Enabled Relationship Management (TERM) market, defined by Gartner as "the worldwide market for providing IT as an enabler in all types of selling, marketing, and servicing." Similarly, front office suites are comprised of three basic categories of functionality: sales, service, and marketing.

Cross Sell: Selling related goods and services to a consumer. This process is only one way to increase your share of Customer.

CTI (Computer Telephony Integration): Enabling computers to know about and control telephony functions such as making and receiving voice, fax, and data calls, telephone directory services, and caller identification. The integration of telephone and computer systems and is a major development in the evolution of the automated office.

Customer Acquisition: The concept of getting new customers and make them part of the company's business.

Customer Activity Data Mart: Customer activity datamarts store data about customer including what, when, where to buy.

Customer Database: Databases, which stores information and history about customers.

Customer Lifecycle: Engagement: Phase consisting of various marketing activities aiming to attract customers in order to make them a part of the business.

Customer Lifecycle: Fulfillment: Phase concerned with the back office operations and supply chain management. It starts after the receipt of the order and contains all logistic and financial processes.

Customer Lifecycle: Service: Phase concerned with the after sales service to customers. It aims bringing together sales and support that includes all processes of customer service.

Customer Lifecycle: Transaction: Phase beginning after the customer attention is attracted and the sales process has begun. It consists of the processes that involve customer interaction with the company

Customer Lifetime Value: Lifetime Value (LTV); the net present value of the future profit stream from a customer. Actual value over Strategic Value could be thought of as Share of Customer.

Customer Self Service: In some industries it is not critical to have the after sales service at field. Customers may want to reach a center to search for a solution of their problems. The tools for that self-searching for claims are called customer self service.

Customer Win-Back: If customers have bought at least once from a company and they stopped because of any reason, the company's objective might be customer win back.

D-AMPS: See TDMA.

Data Warehousing: These databases combine data from other system databases to allow query by sophisticated analysis tools. Datawarehouses usually involve enterprise data and hold extremely large amounts of data.

DCS-1800: GSM networks using the 1'800 Mhz frequency.

DECT: Digital Enhanced Cordless Telecommunications. A standard for cordless telephony originally established by ETSI (see below).

Digital: Representation of voice or other information using digits 0 and 1. The digits are transmitted as a series of pulses. Digital networks allow for higher capacity, greater functionality and improved quality. Examples of digital cellular networks include GSM, CDMA, and TDMA.

Domain Name System (DNS): Databases located throughout the Internet that contain Internet naming information, including tables that cross reference domain names with their underlying IP numbers.

Domain Name: The registered name of an individual or organization eligible to use the Internet. Domain names have at least two parts and each part is separated by a dot. The

name to the left of the dot is unique for each top-level domain name, which is the name that appears to the right of the dot.

DSL: Digital subscriber line. See also xDSL.

Dual-mode (also tri-mode or multi-mode): Handsets that can work with more than one different standard and/or at more than one frequency.

E-Commerce: E-commerce deals with using the Internet, digital communications and IT applications to enable the buying or selling process. Some experts define e-commerce as all steps that occur in any business cycle; others as consumer and business purchases over the Internet. Yet another definition includes IT-support transactions, such as the sale of computer code by programmers that occur online.

e-commerce: Electronic commerce. Term used to describe transactions that take place on-line where the buyer and seller are remote from each other.

EDGE: Enhanced Data rates for GSM Evolution. An intermediate technology, still under development, that brings second-generation GSM closer to third-generation capacity for handling data speeds up to 384 kbit/s.

E-Mail Management: Applications to manage the e-mail traffic between customers and the enterprise. The emails are sorted based on their values and template answers are sent with help of this tool.

E-mail: Electronic mail. The exchange of electronic messages between geographically dispersed locations.

End to End Process Flow: Includes all sub-processes and activities, and the sequence required to accomplish the goals of the process. An end to end process has a beginning and an end with specific result expectations.

End User: An end user is in the domain of the customer, who is interested in using communications and data services, e.g., Telecom, Internet/Intranet, Mobile/Wireless, etc.

End-user: The individual or organization that originates or is the final recipient of information carried via the Internet (i.e. the consumer).

Enhanced Message Service (EMS): EMS is a text service allowing mobile users to send and receive short text messages from other mobile and PC users. Compared to SMS, EMS

includes additional features such the transmission of simple melodies, graphics, sounds, animations and modified text as an integrated message.

ENUM: Standard adopted by Internet Engineering Task Force (IETF), which uses the domain name system (DNS) to map telephone numbers to Web addresses or uniform resource locators (URL). The long-term goal of the ENUM standard is to provide a single number to replace the multiple numbers and addresses for users' fixed lines, mobile lines, and e-mail addresses.

ERP Extensions: ERP vendors are also building their own CRM solutions. With automatic ties to the back office, ERP vendors are winning business in their customer bases.

Exchange: See Switch.

Extranet: An extranet is an intranet that is partially accessible to authorized outsiders, through the use of passwords.

FDD: Frequency Division Duplex. One technique used for wireless communications where the up link and down link are at different frequencies.

FDMA: Frequency Division Multiple Access. A cellular technology that has been used in the firstgeneration analogue systems (i.e., NMT, AMPS, and TACS).

FFSK: Fast Frequency Shift Key Modulation

Field Service: A term that describes the service given to the customer on their side. Such as fixing dishwasher or washing machine at customer's home.

Fixed line: A physical line connecting the subscriber to the telephone exchange. Typically, fixed-line network is used to refer to the PSTN (see below) to distinguish it from mobile networks.

Frequency: The rate at which an electrical current alternates, usually measured in Hertz (see Hz). It is also used to refer to a location on the radio frequency spectrum, such as 800, 900 or 1'800 Mhz.

Front-office: All of the applications used from lead generation to after sales service, in other words the company's representatives use front office applications when they treat customers face-to-face.

FSK: Frequency Shift Key

Gateway: Any mechanism for providing access to another network.

Gbit/s: Gigabit per second. See also bit/s.

GDP: Gross domestic product. The market value of all final goods and services produced within a nation in a given time period.

GMPCS: Global Mobile Personal Communications by Satellite. A new generation of non-geostationary satellite systems that is intended to provide global communications overage to small handheld devices.

GNP: Gross national product. The market value f all final goods and services produced in a nation's economy, including goods and services produced abroad.

GPRS: General Packet Radio Service. A 2.5G mobile standard typically adopted by GSM operators as a migration step towards 3G (W-CDMA). Based on packet-switched technology enabling high-speed data transmission (approx. 115 kbit/s).

GPS (global positioning system): Refers to a "constellation" of 24 "Navstar" satellites launched initially by the United States Department of Defense, that orbit the Earth and make it possible for people with ground receivers to pinpoint their geographic location. The location accuracy ranges from 10 to 100 metres for most equipment. A European system, Galileo, is also under development.

GSM: Global System for Mobile communications. European-developed digital mobile cellular standard. The most widespread 2G digital mobile cellular standard, available in over 170 countries worldwide. For more information see the GSM Association website at: http://www.gsmworld.com/index.html.

GSMK: Gaussian Minimum Shift Key Modulation

Hand-off: A central concept of cellular technology, enabling mobility for subscribers. It is a process by which the Mobile Telephone Switching Office passes a mobile phone conversation from one radio frequency in one cell to another radio frequency in another as a subscriber crosses the boundary of a cell.

HiperLAN: High-Performance Radio Local Area Network. An ETSI standard that operates at up to 54 Mbit/s in the 5 GHz RF band.

HiperLAN2: High Performance Radio LAN Type 2. Wireless LAN (specified by ETSI/BRAN) in the 5 GHz IMS Band with a bandwidth up to 50 Mbit/s. HiperLAN2 is compatible with 3G WLAN systems for sending and receiving data, images, and voice communications.

Host: Any computer that can function as the beginning and end point of data transfers. Each Internet host has a unique Internet address (IP address) associated with a domain name.

HSCSD: High Speed Circuit Switched Data. An intermediary upgrade technology for GSM based on circuit-switched technology and enabling data service speed of 57 kbit/s.

HTML: Hypertext Markup Language. A Hypertext document format used on the World Wide Web. Mark-up languages for translating Web content onto mobile phones include cHTML, WML and xHTML.

HTTP: Hypertext Transfer Protocol. Hypertext is any text that cross-references other textual information with hyperlinks.

Hz: Hertz. The frequency measurement unit equal to one cycle per second.

IDIC Rule: The four-step methodology for implementing one-to-one relations with customers. IDIC stands for - identify customers, differentiate them, interact with them and customize.

IMEI: International Mobile Equipment Identity. Unique serial number used on mobile phones, typically those connected to the GSM network.

IMT-2000: International Mobile Telecommunications. Third-generation (3G) "family" of mobile cellular standards approved by ITU. For more information see the website at: http://www.itu.int/imt.

Incumbent: The (former) monopoly service and network provider in a particular country.

Instant messaging (IM): Refers to programs such as AOL Instant Messenger and ICQ that allow users to exchange messages with other users over the Internet with a maximum delay of one or two seconds at peak times. Mobile versions of IM have also been launched in 2002.

Interconnection: The physical connection of telecommunication networks owned by two different operators. Network operators typically charge a per minute fee for use of their network by other operators (referred to as an "interconnection charge", "access charge" or "network usage charge").

Internet backbone: The high-speed, high capacity lines or series of connections that form a major pathway and carry aggregated traffic within the Internet.

Internet Content Provider: A person or organization , that provides information via the Internet either with a price or free of charge.

Internet Service Provider (ISP): ISPs provide end-users, and other ISPs, access to the Internet. ISPs may also offer their own proprietary content and access to online services such as e-mail.

Internet: The collection of interconnected networks that use the Internet protocols (IP).

IP telephony: Internet Protocol Telephony. IP telephony is used as a generic term for the conveyance of voice, fax and related services, partially or wholly over packet-switched IP-based networks. In this report, IP telephony is used interchangeably with Voice over Internet Protocol (see VoIP). A third term, Internet telephony, is used when referring to IP Telephony conveyed partially or wholly over the Internet.

IP: Internet Protocol. The dominant network layer protocol used with the TCP/IP protocol suite.

IPO: Initial public offering. The first sale of publicly tradable stock shares in a company.

IPSec: Internet Protocol Security. A technology for encrypting IP packets. An additional feature for IPv4 but a standard feature of IPv6.

IPv4: Internet Protocol version 4. The version of IP in common use

IPv6: Internet Protocol version 6. The emerging standard, which aims to rectify some of the problems seen with IPv4, in particular the shortage of address space.

IS-136: EIA/TIA – A Standard (1994)

IS-54: EIA/TIA /IS-54 – A Standard (March 1991)

ISDN: Integrated Services Digital Network. A digital switched network, supporting transmission of voice, data and images over conventional telephone lines.

ISP: Internet Service Provider. ISPs provide endusers, and other ISPs, access to the Internet. ISPs may also offer their own proprietary content and access to online services such as e-mail.

ITU: International Telecommunication Union. The United Nations specialized agency for telecommunications. See http://www.itu.int/.

IVR (Interactive Voice Response): A telecommunications system, prevelant with PBX and voice mail systems, that uses a prerecorded database of voice messages to present options to a user, typically over telephone lines. User input is retrieved via DTMF tone key presses. When used in conjunction with voice mail, for example, these systems typically allow users to store, retrieve, and route messages, as well as interact with an underlying database server which may allow for automated transactions and data processing.

Local Area Network (LAN): A computer network that spans a relatively small area. Most LANs are confined to a single building or group of buildings. However, one LAN can be connected to other LANs over any distance via telephone lines and radio waves. A system of LANs connected in this way is called a wide-area network (WAN).

Local loop: The system used to connect the subscriber to the nearest switch. It generally consists of a pair of copper wires, but may also employ fibre-optic or wireless technologies.

Location-based services (LBS): LBS make use of information on the location of a mobile device and user, and can exploit a number of technologies for the geographic location of a user. Some of these technologies are embedded in the networks and others in the handsets themselves. Location capability is already available to some level of accuracy (approx. 150 m) for most users of cellular networks. Increased accuracy can become available through location technologies such as GPS (Global Positioning System—see above). Commercial applications include the possibility for targeted advertising depending on the geographic region of a particular user.

Loyalty: The degree to which customers are influenced to stay with your company and resist competitive offers. Strong loyal customers adopt also themselves into the advocate role for the company.

Main telephone line: Telephone line connecting a subscriber to the telephone exchange equipment. This term is synonymous with the term ‘fixed line’ used in this report.

Marketing Automation: Bringing technology to the marketing process such as database marketing. Marketing automation is the essential link between the front and back offices and sharing customer information at the enterprise level

MASP (mobile application service provider): MASPs provide the same service to mobile clients as regular application service providers provide to fixed-line clients, that is to say Web-based access to applications and services that would otherwise be stored locally.

Mb: Mega bit.

Mbit/s: Megabit per second. See also bit/s.

m-commerce: Mobile Commerce. Similar to ecommerce but the term is usually applied to the emerging transaction activity in mobile networks.

MCS: Mobile Communication System

MDG: Millennium Development Goals. The 8 MDGs are global targets that 191 nations adopted at the UN Millennium Summit (September 2000). They include specific goals for human development and poverty eradication to bemet by 2015.

M-mail: Mobile-mail. An application that allows a mobile phone user to send a mail to an Internet e-mail user.

Mobile Sales: Laptops, Palm Devices are basic technology enablers for sales representatives. All the applications and tools used on these devices for sales automations are called mobile sales .

Mobile Virtual Network Operator (MVNO): An MVNO can be defined as a mobile service provider that offers mobile services but does not own its own radio frequency. Typically, MVNOs lease capacity from operators, e.g. licensed 2G and 3G operators.

Mobile: As used in this report, the term refers to mobile cellular systems.

Most Growable Customers: Those customers for whom the Strategic Value, that is the potential value of the customer, most exceeds the customer's current Actual Value. These are the customers who have the most growth potential -- growth that can be realized through cross selling; through keeping the customer for a longer period; or perhaps by changing a customer's behavior and getting them to operate in a way that costs the

enterprise less money. Most Growable Customers are also known as second-tier customers (STCs).

Most Valuable Customers: Those customers with the highest actual value to the enterprise -- the ones who do the most business, yield the highest margins, are most willing to collaborate, and tend to be the most loyal. MVCs are those with whom the company probably has the greatest Share of Customer. The objective of an enterprise with respect to its MVCs is retention.

MP3: MPEG-1 Audio Layer-3 (MPEG stands for Moving Pictures Experts Group). A standard technology and format for compression of a sound sequence into a very small file (about one-twelfth the size of the original file) while preserving the original level of sound quality when it is played.

m-tailing: Mobile tailing. Expression used in the billing and charging environment for mobile retailing.

Multimedia Message Service (MMS): MMS will provide more sophisticated mobile messaging than SMS or EMS. A global standard for messaging, MMS will enable users to send and receive messages with formatted text, graphics, audio and video clips. Unlike SMS and most EMS, it will not be limited to 160-characters per message.

Network Operator: An organization that operates a communications network, network or data services capability, acting basically as a wholesaler. A network operator is a service provider. A service provider may provide the network operator role or may subcontract this role.

NMT: Nordic Mobile Telephone system. An analogue mobile cellular system developed in the Nordic countries.

NO: Network operator. The organization responsible for the operation of the infrastructure that forms a wireless network, who could also be a service provider.

Number portability: The ability of a customer to transfer an account from one service provider to another without requiring a change in number.

One to One Marketing (1:1 Marketing): Focused on the individual customer, one-to-one marketing is based on the idea of an enterprise knowing its customer. Through interactions with that customer the enterprise can learn how he or she wants to be treated. The

enterprise is then able to treat this customer differently than other customers. However, one-to-one marketing does not mean that every single customer needs to be treated uniquely; rather, it means that each customer has a direct input into the way the enterprise behaves with respect to him or her.

Operational CRM: Focused on the operations that support Marketing, Sales and Service processes where the customer interaction is provided through channels such as; web, e-mail, call center.

Order Management: Storing and tracking the orders and providing the system until the cash process of each orders.

Order Promising: Logistic part of order management including supply management for product delivery.

Outsourcing Partners: CRM outsourcing partners typically involve either the complete or partial transfer of contact center/customer interaction center/ application hosting via remote access activities to a specialized service provider.

Packet: An information block identified by a label at layer 3 of the OSI reference model. (Source: CCITT Blue Book Volume 1 Fascicle1.3 Terms and Definitions).

Packet-switching: The function of handling, routing, supervising and controlling user packet data, as required, by an exchange. (Source: CCITT Blue Book Volume 1 Fascicle1.3 Terms and Definitions).

Pareto Principle: Named after Vilfredo Pareto, the 19th-Century economist and sociologist, the Pareto Principle is also known as "the 80:20 rule." It says that 80 percent of an enterprise's revenue comes from 20 percent of its customers. In practical terms, though, it might be 90 percent of the revenue coming from 5 percent of the customers, or 60 percent coming from 30 percent of customers, depending on the firm's Valuation Skew of its customer base.

PCS: Personal Communication Services. In the United States, refers to digital mobile networks using the 1’900 Mhz frequency. In other countries, refers to digital mobile networks using the 1’800 Mhz frequency (See DCS-1800). The term Personal Communications Network (PCN) is also used.

PDA: Personal Digital Assistant. A generic term for handheld devices that combine computing and communication functions.

Peak rate: Term used for calls made during the busy part of the working day, at full tariff. Offpeak refers to calls made at other times, with discounted tariffs.

Penetration: A measurement of access to telecommunications, normally calculated by dividing the number of subscribers to a particular service by the population and multiplying by 100. Also referred to as teledensity (for fixed-line networks) or mobile density (for cellular ones).

Personal Area Network (PAN): For the purposes of this report, a PAN is referred to as the interconnection of information technology devices within the range of an individual person, typically within a range of 10 meters. For example, a person travelling with a laptop, a personal digital assistant (PDA), and a portable printer could interconnect these devices through a wireless connection, without the need for physical wiring. Conceptually, the difference between a PAN and a wireless LAN is that the former tends to be centered around one person while the latter is a local area network (LAN) with a greater range of wireless connectivity, typically serving multiple users.

PKI (public key infrastructure): PKI (public key infrastructure) enables users of unsecure public networks such as the Internet to securely and privately exchange data and/or funds. This is done using public key cryptography, i.e. through the use of a public and a private cryptographic key pair that is obtained and shared through a trusted authority (e.g. certification authority). PKI provides a digital certificate that can identify an individual or an organization and directory services that can store and, when necessary, revoke the certificates.

POPs: The population within a mobile operator's licensed area. Confusingly, in the Internet world, the same abbreviation is used to describe Points of Presence.

Portal: Although an evolving concept, the term portal commonly refers to the starting point, or a gateway through which users navigate the World Wide Web, gaining access to a wide range of resources and services, such as e-mail, forums, search engines, and shopping malls. A mobile portal implies a starting point which is accessible from a mobile phone.

PPP: Purchasing power parity. An exchange rate that reflects how many goods and services can be purchased within a country taking into account different price levels and cost of living across countries.

Process: A systematic, sequenced set of functional activities that deliver a specified result.

Product Data Mart: Data marts are smaller versions of datawarehouses and usually store a smaller set of data and more departmental in scope. Product data marts store product data.

Proportionate subscribers: The number of subscribers of a mobile cellular operator based on ownership. Calculated by multiplying the mobile cellular operator's share of ownership (equity) in a particular subsidiary by the total number of subscribers.

Protocol: A set of formal rules and specifications describing how to transmit data, especially across a network.

PSTN: Public Switched Telephone Network. The public telephone network that delivers fixed telephone service.

PTO: Public telecommunication operator. A provider of telecommunication infrastructure and services to the general public. The term public relates to the customer rather than the ownership of the PTO.

Public payphone: Typically supplied and operated by the incumbent carrier, public payphones have been a traditional method of encouraging widespread access to telecommunication facilities.

QCELP: Qualcomm Code Excited Linear Predictive Coding

Quality of Service (QoS): Quality of Service is the measure of service quality defined for a service and provided to a customer. Quality of Service is the definition of the performance parameters used to assess service quality. The parameters are usually associated with a specific service or service type.

Release 2000: Release from 3GPP. Term applied to the group of specifications due to be released in early 2001 which will concentrate on the core network. Also known as Version 5.

Release 4: Standards Release from 3GPP. Term applied to the group of standards released by 3GPP in March 2001 that concentrate on the core network. Previously known as Release 00.

Release 5: Standards Release from 3GPP. The release that will introduce the IP multimedia subsystem into the network.

Release 99: Standards Release from 3GPP. Term applied to the group of standards forming the first phase of standards released by 3GPP in December 1999 mainly concentrating on the radio access network.

RELP: Residual Excited Linear Predictive Coding

Retention Rate: Another term that describes customer loyalty. A low retention rate describes high customer disloyalty. It means the rate of customers among all who have bought at least two times.

Roaming: A service allowing cellular subscribers to use their handsets on networks of other operators or in other countries.

RPP: Receiving party pays. Billing option whereby the person receiving a call is charged in addition to the person initiating the call (as opposed to only the caller paying, see CPP).

Sales Automation: The sales representatives need the sales automation technology regardless where they interact the customer during entering the necessary data for the system, reading the product catalogs, making sales forecasts, doing pipeline management and tracking opportunities.

Sales Force Automation: Using technology to automate the sales process. Some technologies that can be used for sales automation are: Laptop computers, Personal digital assistants, Contact databases ,Interactive selling systems

Secure Sockets Layer (SSL): SSL (Secure Sockets Layer) is a programme layer created by Netscape for managing the security of message transmissions in a network. SSL uses a publicand- private key encryption system, which also includes the use of a digital certificate.

Server: (1) A host computer on a network that sends stored information in response to requests or queries. (2) The term server is also used to refer to the software that makes the process of serving information possible.

Service Level Agreements (SLAs): A Service Level Agreement can be considered part of contract with the customer. In many cases, it is part of or an addendum to the contract with the customer. The SLA is a negotiated agreement between a customer and a service provider, defining the service provided and the set of metrics to be used to measure the level of service committed against the level of service provided. Such service levels might include network performance metrics, installation completion on time metrics and intervals for new orders, availability, call pick up times at a work center, maximum periods of outage, average and minimum throughput, etc. The SLA also frequently defines trouble reporting and escalation procedures, reporting requirements and the general responsibilities of both parties.

Service Provider: Service provider refers to companies who provide communications and/or data services as a business. Service providers may operate networks, or they may integrate the services of other providers to deliver a total service to their customers.

Share of customer: In contrast to Market Share, share of customer refers to the percentage of a particular customer's business a firm gets over that customer's lifetime of patronage. The ratio of a customer's Actual Valuation to Strategic Valuation.

SIM: Subscriber identity module (card). A small printed circuit board inserted into a GSM-based mobile phone. It includes subscriber details, security information and a memory for a personal directory of numbers. This information can be retained by subscribers when changing handsets. See also USIM.

SMS: Short Message Service. A service available on digital networks, typically enabling messages with up to 160 characters to be sent or received via the message centre of a network operator to a subscriber’s mobile phone.

SMTP: Simple Mail Transfer Protocol. A protocol designed for the seamless transmission of electronic mail across an Internet using e-mail servers and clients.

Spectrum: The radio frequency spectrum of hertzian waves used as a transmission medium for cellular radio, radiopaging, satellite communication, over-the-air broadcasting and other services.

Sub Process and Activity: Processes consist of a set of activities and/or sub processes that must be executed for the overall process to deliver the desired result. An activity is used to refer to the action required by the specific process and is usually fairly focused. A sub-process is a collection of activities or an interface for a specific set of work activities that are required to accomplish the desired results from the process.

Supply Chain Management: The use of information technology to automate the coordination of activities and the flow of information across the members of the supply chain to increase operational efficiencies and market effectiveness

Switch: Part of a mobile or fixed telephone system that routes telephone calls to their destination.

TACS: Total Access Communications System. An analogue mobile cellular system.

TCP: Transmission Control Protocol. A transport layer protocol that offers connection-oriented, reliable stream services between two hosts. This is the primary transport protocol used by TCP/IP applications.

TDD: Time Division Duplex. One technique used for wireless communication where the up link and down link use the same frequencies.

TDMA IS-136: A digital cellular standard earlier referred to as D-AMPS. For more information see the Universal Wireless Communications Consortium website at: http://www.uwcc.org.

TDMA: Time Division Multiple Access. A digital cellular technology that divides frequency into time slots. It is the prevalent technology of the second-generation digital cellular with three main versions: North American TDMA (IS-136); European TDMA (GSM); and Japanese TDMA (PHS/PDC).

Teledensity: Number of main telephone lines per 100 inhabitants.

Total teledensity: Sum of the number of fixed lines and mobile phone subscribers per 100 inhabitants.

Transmission Control Protocol/Internet Protocol (TCP/IP): The suite of protocols that defines the Internet and enables information to be transmitted from one network to another.

UIM: User Identity Module. See USIM.

UMTS: Universal Mobile Telecommunications System. The European term for third-generation mobile cellular systems or IMT-2000 based on the W-CDMA standard. For more information see the UMTS Forum website at: http://www.umts-forum.org/.

Uniform Resource Locator (URL): The standard way to give the address or domain name of any Internet site that is part of the World Wide Web (WWW). The URL indicates both the application protocol and the Internet address, e.g. http://www.itu.int.

Universal access: Refers to reasonable telecommunication access for all. Includes universal service for those that can afford individual telephone service and widespread provision of public telephones within a reasonable distance of others.

Up Sell: Selling upgrades, add-ons, or enhancements to a particular product or service.

USIM: Universal Subscriber Identity Module (card). A printed circuit board (similar to a SIM) that is inserted into a mobile phone. Adopted by W-CDMA operators for 3G mobile. Capable of storing much more information and has strong security functions compared with SIMs. Also referred to as User Identity Module, or UIM.

UTRA: UMTS Terrestrial Radio Access. The European third-generation mobile standard ETSI has agreed on which draws upon both W-CDMA and TDMA-CDMA proposals.

VoIP: Voice over IP. The generic term used to describe the techniques used to carry voice traffic over IP (see also IP).

VRELP: Vector Sum Excited Linear Predictive Coding

VXML: Voice eXtensible Markup Language. A new standard under development that uses voice to browse the Web.

WAP: Wireless Application Protocol. A license free protocol for wireless communication that enables the creation of mobile telephone services and the reading of Internet pages from a mobile phone, thus being a mobile equivalent of HTTP (Hypertext Transfer Protocol).

W-CDMA: Wideband Code Division Multiple Access. A third-generation mobile standard under the IMT-2000 banner, first deployed in Japan. See also CDMA.

Web-based CRM Applications: The competitive advantages of moving to Web-based technology include "anytime, anyplace" access to account information, an easily portable office, and the ability to arrive at customer meetings with a "virtual sales team" in a laptop, as information on current orders, inventory levels, and even product plans is accessible real-time during the meeting.

Website / Web page: A website (also known as an Internet site) generally refers to the entire collection of HTML files that are accessible through a domain name. Within a website, a webpage refers to a single HTML file, which when viewed by a browser on the World Wide Web could be several screen dimensions long. A "home page" is the webpage located at the root of an organisations URL.

Wireless Fidelity (Wi-Fi): Refers to Wireless Fidelity, the 802.11b specification for Wireless LANs from the Institute of Electrical and Electronics Engineers (IEEE). It is part of a series of wireless specifications which also includes802.11a, and 802.11g.

Wireless LAN (WLAN): A wireless network whereby a user can connect to a local area network (LAN) through a wireless (radio) connection, as an alternative to a wired local area network. The most popular standard for wireless LANs is the IEEE 802.11 series.

Wireless: Generic term for mobile communication services which do not use fixed link networks for direct access to the subscriber.

World Wide Web (WWW): Technically refers to the hypertext servers (HTTP servers) which are the servers that allow text, graphics, and sound files to be mixed together. Loosely refers to all types of resources that can be accessed.

xDSL: While DSL stands for digital subscriber line, xDSL is the general representation for various types of digital subscriber line technology, such as ADSL (asynchronous digital subscriber line), HDSL (high bit-rate digital subscriber line), or VHDSL (very high bit-rate digital subscriber line).

xHTML: extensible Hypertext Markup Language. Defines a single namespace for html: http://www.w3.org/1999/xhtml. Relies on HTML 4.01 for the semantics and data types of elements and attributes. Defines XHML 1.0 DTDs corresponding to HTML4's strict,

transitional and frameset DTDs. Provides guidelines for authoring XHTML documents for delivery to existing Web browsers. Existing HTML can be trivially converted to XHTML using W3C's Open Source HTML Tidy utility.

XML: eXtensible Mark-up Language. An open standard for describing data from the W3C. It is used for defining data elements on a web page and business-to-business documents. By providing a common method for identifying data, XML supports business-to-business transactions is expected to become the dominant format for electronic data interchange.

APPENDIX: V SAMPLE OF THE QUESTIONNAIRE

Master Thesis Research Questionnaire

Effect of 3G Technologies on CRM in Telecom Industry

Submitted to: Yrd. Doç. Dr. Atilla ÖNER, Yeditepe University, Istanbul, Turkey

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Introduction

Dear Sir or Madam,

This questionnaire is prepared to research impact of 3rd Generation Wireless Services on CRM business functions. The research results will be used in my MBA thesis which will be submitted to Yeditepe University, Social Sciences Graduate Studies, Istanbul, Turkey on January 2004. Your name, surname, email, title, phone number and company information will be kept confidential and will not be reported in the research results. Your personal information, if you submit, will only be used to send you the summary of research results. The results will not be classified on company basis in order not to violate confidentiality.

The questionnaire consists of 4 parts which are contact information, market expectations, service portfolio expectations and customer care processes impact. This questionnaire is planned to send to telecom technology vendors, telecom and CRM business consultants, telecom employees, marketing employees and industry experts.

Although we wish all participants to answer all questions, participants do not need to answer all of the questions and can submit answers partially.

Thanks again for your consideration, time and kind support.

Sincerely

Arda Karacelebi

Quick Reminder

2G Services: Second generation wireless communication services. These services use digital radio channels. Current GSM, CDMA and TDMA operators (majority of the wireless carriers) support these services.

2.5G Services: 2.5th generation wireless communication services. The packaged data transmission is supported. These services have higher data transfer capability then 2G networks. GPRS and EDGE services can be considered in that category.

3G Services: 3rd generation wireless services (UMTS services) which provide higher packaged data transformation capabilities then 2G and 2.5G services.

Glossary: http://www.umts-forum.org/glossary.asp

Contact information of the participants

Your name, surname, email, title, phone number and company information will be kept confidential and will not be reported in the research results. Your personal information, if you submit, will only be used to send you the summary of research results. The results will not be classified on company basis.

Question	Available Answers
Name:	(Free Text Area)
Surname:	(Free Text Area)
Title:	(Free Text Area)
eMail:	(Free Text Area)
Company:	(Free Text Area)
Business Function:	No answer, Strategic Planning, Marketing, Sales, Customer Care, Field Service, Financial, Project Management and Consulting, Information Systems, Network Planning and Operations, Product Development, Supply Chain, Content Management, Manufacturing
Industry:	No answer, Financial, Wireless Telecom Operator, Wireline

	Operator, Telecom Vendor, Consulting, Information Systems, Retail, Distribution, Transportation, Pharmaceuticals, Education, Health Care, Manufacturing, Construction, Travel, Agriculture

Market effect

Question	Available Answers
Do you think that 3G services will create challenging competition? Are 3G implementations required?	No answer, Strongly agree, Agree, Do not know, Disagree, Strongly disagree
When do you expect the new 3G services will implemented widely in the market?	No answer, Do not know, 1 years, 2 years, 3 or 4 years, 5 or more years, Will not implemented
Do you think that 3G will create positive effect on ARPU (Average Revenue Per User)?	No answer, Strongly agree, Agree, Do not know, Disagree, Strongly disagree
Do you expect non voice services revenue will dominate voice-services revenue in next 5 years?	No answer, Strongly agree, Agree, Do not know, Disagree, Strongly disagree
Do you think that more acquisition and merge will be held in the telecommunications industry? And there will be very few telecom groups operating as a network provider?	No answer, Strongly agree, Agree, Do not know, Disagree, Strongly disagree
Do you think that MVNO (Mobile Virtual Network Operator) concept will be more popular after the implementation of 3G?	No answer, Strongly agree, Agree, Do not know, Disagree, Strongly disagree
Do you think that developing marketing and bundle partnerships will be crucial in 3G business models?	No answer, Strongly agree, Agree, Do not know, Disagree, Strongly disagree

Will Telecom operators support new business models on time?	No answer, Strongly agree, Agree, Do not know, Disagree, Strongly disagree
Will Telecom providers' business partners and business customers support new business models on time?	No answer, Strongly agree, Agree, Do not know, Disagree, Strongly disagree
Do you think that outsourcing will be more popular for telecom companies for following business functions after the implementation of 3G? (Available Answers: No answer, Strongly agree, Agree, Do not know, Disagree, Strongly disagree)	
Finance:	
Billing:	
HR:	
Supply Chain:	
Installation & Construction:	
IT:	
Customer Care (without call centers):	
Call/Contact Centers:	
Please rate the market acceptance of the following business models... (Available Answers: No answer, Strongly agree, Agree, Do not know, Disagree, Strongly disagree)	
Portal: Managed gateway to the internet offering advertising and content	
Content/Packager provider: Provides value added information	
Trusted Partner: Provides secure and trusted transactions	
Application Provider: Provides applications such as mobile office, connection to corporate networks	

and back office systems	
Mobile operator: Connection and Session Provider (Traditional wireless provider)	

3G services

Question	Available Answers
Do you think that by the implementation of 3G services, Telcos will start to sell new services which are provided by partner companies?	No answer, Strongly agree, Agree, Do not know, Disagree, Strongly disagree
Do you think 3G services may match the security needs? Video conferencing, location based services, 911 will led families to go on mobile as providing more security capabilities?	No answer, Strongly agree, Agree, Do not know, Disagree, Strongly disagree
What are the killer applications for 3G technology implementations?	(Free Text Area)
Do you think the location based services will threaten privacy?	No answer, Strongly agree, Agree, Do not know, Disagree, Strongly disagree
Do you think legislations such as "privatization act", "spam mailing" and "do not call" lists will become a constraint on business models in the future? Do you expect further legislative constraints?	No answer, Strongly agree, Agree, Do not know, Disagree, Strongly disagree

Considering Maslow's hierarchy of needs pyramid, rate the effect of 2-2.5 G and 3G services on levels of needs? (Available Answers: No answer, Do not know, 1: Do not satisfy, 2, 3, 4, 5, 6, 7, 8, 9, 10: completely satisfy)		
	2 G and 2.5 G	3G
Physiological: basic physical needs (ex: hunger,		

thirst, sex, sleep, vitamins, minerals, temperature, bodily comforts, etc.)		
Safety: security (ex: shelter, protection, insurance, alarm systems, retirement investments, etc.		
Belonging: love, friendship, membership (ex: marriage, children, fraternity, acceptance by others, clothing, grooming products, clubs, drinks, etc.)		
Esteem: to achieve, be competent, gain approval, status and recognition (ex: cars, furniture, credit cards, stores, country clubs, liquors, etc.)		
Self-actualization: self fulfillment (ex: hobbies, travel, education, need for privacy, democratic values, truth, goodness, beauty, unity, wholeness, and transcendence of opposites, aliveness, uniqueness, perfection and necessity, completion, justice and order, simplicity, richness, effortlessness, playfulness, self-sufficiency, meaningfulness, etc.)		

Please rate the expected popularity of the given communication services after the implementation of 3G services. (Available Answers: No answer, Do not know, 1: will not be popular/used, 2, 3, 4, 5, 6, 7, 8, 9, 10: will be extremely popular)	
Conferencing: Mobile Video (Streaming), Mobile Telephony, Simple Voice, Teen Video Chat (Non Real Time), Video Conferencing, Voice Over IP, Voice Portal, Voice-Activation.	
Messaging: E-mail/ Messaging, E-mail Receipt, E-mail Transfer, Instant Messaging/ Message	

Aggregation, Machine to Machine, Mobile Chat, Mobile Instant Messaging, Mobile Postcard, Multimedia Messaging, Short Message Service, Streaming Video/Audio (Non Real Time), Unified Messaging	
Internet Access/ Networking: Application Synchronization, FTP Transfers, Internet, Intranet, Mobile VPN, Web Browsing	
Location-Based Services: Car Navigation, Localized Info (Current User Location), Localized Info (Future/ Planned Route), Location Sensitive (Billing/ Routing), Location-Based M-Commerce, Navigation/ Location, Telematics, Tracking/ Personal Security, Virtual Mouse/ Directional, Wand	
Entertainment: Downloadable Ring Tones/ Graphics, Entertainment, Internet Games, Mobile Music, Online Dating, Online Gambling	
Financial Services: Financial Services, Financial/ Banking, Mobile Cash, Mobile E-Bill, Mobile E-Salary, Stock Trading	
Information Services: Alerts, Dictionary Research, Directories, Emergency Services (E911), Flight Reservation, Info Services, Instant Weather Forecast, M-information (user statistics), Multimedia (video, audio real time), Personal Information Management (PIM), Restaurant Guide, Yellow Pages, Virtual Home Environment (VHE)	
Mobile Commerce: Advertising, B2B Business	

Data Applications, eWallets & Shopping Enhancements, Just the Ticket, M-Commerce Transactions, ME Commerce, Micro-Payments, Mobile Retailing, Transaction Processing</td>	
What are most important 3 features on a handset to support 3G services for following user groups? (Available Answers: No answer, Do not know, Brand, Latest model, Design and color, Technological capability, Price, Simplicity/usability, Durability, Coverage and connection quality, Battery life, Weight, Personalization, Radio/mp3 player, Video player, Game, Keyboard, Size of screen, Quality of screen)	
a)For Teens:	
b)For Adults:	
c)For Business:	

Customer care

Question	Available Answers
Do you think call center employee profiles will change significantly after the implementation of 3G?	No answer, Strongly agree, Agree, Do not know, Disagree, Strongly disagree
Do you think operational cost of call centers will increase significantly after the implementation of 3G?	No answer, Strongly agree, Agree, Do not know, Disagree, Strongly disagree
Do you expect overseas call center operations will relocated back to the countries which they support for?	No answer, Strongly agree, Agree, Do not know, Disagree, Strongly disagree
Do you think that 3G will lead increase in usage of call centers?	No answer, Strongly agree, Agree, Do not know, Disagree, Strongly disagree
Do you think that 3G will lead increase in usage of web and self service systems?	No answer, Strongly agree, Agree, Do not know, Disagree, Strongly

	disagree
Do you expect to face improved customer satisfaction in call centers after the implementation of 3G services?	No answer, Strongly agree, Agree, Do not know, Disagree, Strongly disagree
Do you think market intelligence will be much more important by the implementation of 3G services?	No answer, Strongly agree, Agree, Do not know, Disagree, Strongly disagree
Do you think that customers will expect higher quality in customer care services after the implementation of 3G services?	No answer, Strongly agree, Agree, Do not know, Disagree, Strongly disagree
Please rate the impact of 3G communication technologies on following customer problem or question classifications. (Available Answers: No answer, 1: No effect, 2, 3, 4, 5, 6, 7, 8, 9, 10: Strong Impact)	
Service Provisioning:	
Service Complaints:	
Billing Inquiries:	
Lost /Stolen Equipment or Fraud Declaration	
Technical Support:	
Service Quality:	
mCommerce Transactions	
Value-Added Services:	
Do you want to add anything?	(Free Text Area)

RESUME

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PROFESSIONAL EXPERIENCE

2004-Present Capgemini Consulting, Senior Information Systems Analyst

- Designed and implemented technological solutions mainly Ariba eprocurement solutions for Goodyear and Cummins for their supply chain processes such as supplier catalog management, analysis, procurement, contract management, category management and sourcing.

2002-Present Lighthouse Consulting, Consultant

- Modeled the churn and customer segmentation models for Sprint Canada, a debit card company (a subsidiary of Bell Canada) and Sygenta
- Supported development of a loyalty management programs for major Canadian Retailers
- Prepared benchmark documentation for call center channels for American Express
- Prepared proposals for major Telecom Vendors
- Supported customer size of wallet, income prediction, segmentation and loyalty management projects for major Canadian corporations such as TD Bank and Dofesco.

2002 Jan/Sep Andersen Business Consulting, Senior Business Consultant

- Reengineered & designed CRM Processes of a major Telco

1998-2002 Ernst & Young Management Consulting, Business Consultant

- Supported CRM, ERP and eBusiness projects and participated in reengineering projects

EDUCATION & CERTIFICATION

2000 Certified Clarify CRM Consultant, Nortel Networks, Istanbul

1991-1998 Bogazici University, BSc. Industrial Engineering

1984-1991 TED Zonguldak College High School

PROFESSIONAL TRAINING

Facilitated Session Management and Leadership, Induction to Consulting, Business Process Modeling, Effective Team Building, Reengineering, Strategic Thinking and Action, Advanced Sales Methodologies, Clarify Certification, Oracle (Portal, Order Entry, Supply Chain, Engineering, WIP, Quality, Cash Management, Fixed Assets, Account Payables, Account Receivables, General Ledger, CRM, Workflow, Purchase to Pay, Order to Cash, Reports, Discoverer, Forms, PL/SQL), Codem Message Broker, BAAN Finance

SKILLS

Computer Languages: Clear Basic, PL/SQL, SAS, AML, AQL, HTML, Pascal (Object Oriented), MS Access

Operating Systems: Unix, Windows 95/98/2000/NT/XP

Enterprise Level Applications: SAS Enterprise Miner, JMP, Clarify CRM, Oracle ERP (Order Management, Manufacturing, CRM, Financials) Oracle Portal, BAAN ERP, Oracle Discoverer (OLAP), Oracle Reports, Ariba (Contracts, Category Procurement, Buyer, Catalog Management) Ariba Analysis (Data Warehouse Software), Calico Marketplace, Message Broker, SPSS, and general knowledge on various CRM and eBusiness solutions
Office Desktop Tools: MS Project, Optima, Visio, Word, Excel, PowerPoint, Lotus Notes

SOCIAL ACTIVITIES

- Project Management Institute, PMO-LIG Volunteer Team, Toronto,'03-Present
- Bogazici University Alumni, Volunteer Team, Canada,'02-Present
- APICS (American Production & Inventory Control Society), Member, '00-'01
- Bogazici University Alumni Association, Executive Board Member, '01-'03
- Bogazici University Sports Committee, Vice President'97, General Secretary'96

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