EVALUATION AND IMPROVEMENT OF PROACTIVE CUSTOMER NOTIFICATION IN E-COMMERCE ENVIRONMENT
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Submitted to Sloan School of Management and the Department of Mechanical
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and
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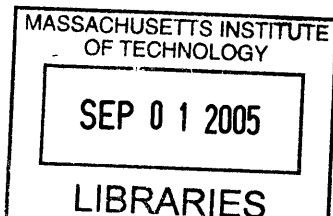   Department of Mechanical Engineering
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ABSTRACT

The Internet, and thus e-commerce, both Business to Consumer (B2C) and Business to Business (B2B), has changed the way companies do business with each other and communicate with their customers. Because of the speed of the Internet, information transfer both among companies and between a company and its customers has become faster, albeit technologically more complex, in the e-commerce era. It has been a challenge for e-companies to develop creative, satisfying ways of communicating with their customers. After all, the Internet is approximately a decade old, and there has not been enough accumulation of knowledge about customer behavior.

Unlike in conventional shopping where the customer takes the product with him/her or makes specific delivery arrangements in a specific geographical zone, in e-commerce the customer picks a specific delivery method from literally anywhere in the world at any time. This, of course, brings many logistical challenges for a successful delivery. Dell Computer Corporation, famous for its build-to-order and direct model, is one of the biggest e-commerce companies in the world and, thus, faces the challenges that any e-commerce company must confront, such as communicating with customers efficiently in a timely manner. Therefore, such logistical challenges that the e-commerce era has brought are not unique to Dell. One such challenge is effective communication with the customer after a shipment is just processed. This thesis focuses on finding best-of-breed technologies and applications in the proactive customer notification field through benchmarking. This thesis also offers a tool to evaluate various technology providers and to make decisions based on the analysis.

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ACKNOWLEDGMENTS

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1. INTRODUCTION AND BACKGROUND

The content presented in this thesis is a result of a six-and-a-half month, on-site internship in the Outbound Logistics Department at Dell in Austin, Texas, and various off-site interactions afterwards. This internship is a part of partnership between Dell and the Leaders for Manufacturing program at the Massachusetts Institute of Technology.

1.1 Thesis Overview

The object of this internship was to identify challenges faced by Dell resulting from inefficient and insufficient communications with customers at the end of the supply chain. A business case was then developed to explore the tangible benefits of addressing these issues. The next step was to identify the best-of-breed proactive notification technology providers and proactive notification processes practiced by different companies.

First, an introduction of the project and a brief history of Dell will be given in this thesis. This will be followed by an explanation and history of proactive notification and its users. Next the benchmarking methodology employed in this research will be explained in greater detail, followed by implementation process steps and the challenges that may arise during the implementation process. Finally, a set of recommendations for the successful implementation of proactive notification technology will be supplied.

1.2 Project Description

Outbound logistics—the transfer of information and physical material between a company and its final customers—has a significant impact on the customer relationship regardless of the company's industry. This fact is more critical in very fast moving and changing industries such as the consumer electronics industry. As the number-one personal computer (PC) manufacturer in the world, Dell has taken necessary actions to improve its outbound logistics operations and, thus, customer relations by several different projects, such as making customer experience (CE) one of its four main strategic initiatives. The Outbound Logistics Department started a project called "Customer Delivery Notification" or "CDN" to enhance the customer experience by overcoming inefficiencies in the outbound supply chain resulting from inefficient communications with the customer.

The CDN project consisted of two different parts: one being strategic and the other operational in nature. This thesis will examine the strategic aspect of CDN, which was the main focus of the internship. The strategic part required a benchmarking study on customer notification systems used across various industries and an analysis of system providers. For this reason, various technology providers and users were contacted and engaged throughout the internship. The interactions between the company and customers when notified of an event and how they are allowed to interact as a result was a key focus area in this stage.

1.2.1 Project Goals

The CDN project was motivated by three main drivers:

1. To decrease the number of calls coming into customer care since approximately 45% of these calls care are Where Is My Order (WISMOs) and return related calls (Figure 1). These are low value-added calls that negatively impact the customer care call center's capacity.

2. To increase the First Time Delivery (FTD) percentage since a low FTD percentage accrues some cost to Dell.

3. To decrease the hard refusal rate. The majority of hard refusals come from customers who are unsatisfied because of ambiguous communication they experienced during the ordering and subsequent processes.

Calls to Customer Care
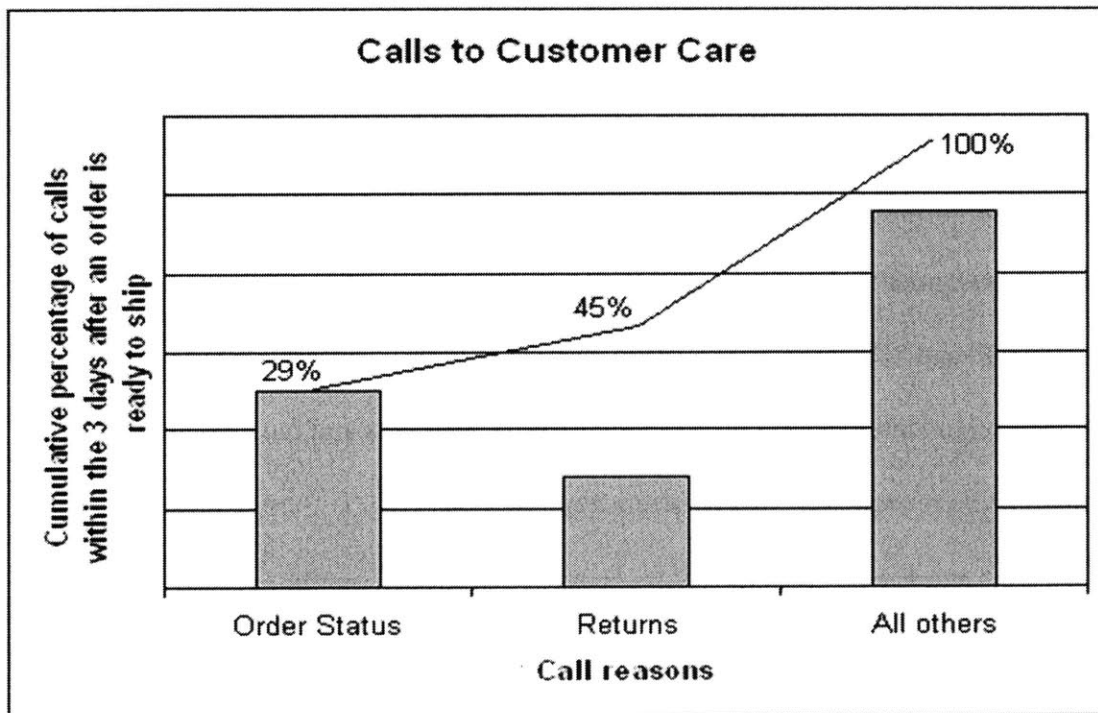
Figure 1: A Pareto analysis of reasons for calls to customer care within three days after an order is ready to ship

1.2.2 Project Scope and Limitations

During the internship, Dell's outbound supply chain was evaluated, though project scope was limited to all Dell mainstream orders and Software and Peripheral (S&P) orders shipped in three to five business-day delivery-network where most of communication inefficiencies occur. The scope excluded international and specialized Value Added Logistical Services (VALS), warranty parts, non-automated shipments, and Servership shipments. Due to the significant logistical challenges that the aggregation of an order with multiple items brings, the project focused on sending proactive notifications for orders with one item or for multiple-items orders with the same delivery date. In cases of an order with multiple items and various delivery dates, each item is treated as a single order with corresponding notifications sent accordingly. Another challenge was to determine which customer segment to notify since Dell has a number of different customer segments including "Consumers", "Small and Medium Businesses", "Educational Institutions, and the "Government". Since the CDN project could not cover all customer segments, the scope was limited to communication with two segments: "Consumers" and "Dell America's Small Business Units". There is a strong need to resolve communication issues with these customer segments and most value-added benefits can be recognized in these segments.

1.3 Company Background

Headquartered in Round Rock, Texas, Dell is a premier provider of products and services used to build information technology and Internet infrastructures. Dell's climb to market

leadership is the resulted from a relentless focus on delivering the best possible customer experience by directly selling standards-based computing products and services.

In 1984 Michael Dell, the computer industry's longest-tenured Chief Executive Officer, founded Dell Inc. on a simple concept: by selling computer systems directly to the consumer, Dell could best understand their needs and provide the most effective computing solutions to meet those needs. This direct business model eliminates the middleman, which adds unnecessary time and cost to the customer. Dell builds every system to order and offers its customers powerful, richly-configured systems at competitive prices. The direct model results in a 98.31 inventory turnover ratio based on the latest data available unlike slow-moving competitors, such as Hewlett-Packard (HP) and International Business Machines (IBM) with indirect distribution channels resulting a 9.25 and 18.62 inventory turnover ratio, respectively.

Dell's regional headquarters are located in Austin for the Unites States, Canada, South America and Latin America; in Bracknell, England, for Europe, the Middle East and Africa (EMEA); and in Singapore for the Pacific Rim, including Japan, India, China, Australia, and New Zealand. The company has six manufacturing locations: Austin, Texas; Nashville, Tennessee; Eldorado do Sul, Brazil; Limerick, Ireland; Penang, Malaysia; and lastly, Xiamen, China.

1.3.1 E-Commerce and Dell

E-Commerce began roughly a decade ago when consumers started buying low-price, less risky products, such as books, online, then eventually progressed to higher cost products like PCs. Now, in the United States (US) and most developed countries, consumers have been shopping online for several years, and they trust e-commerce sites to buy almost anything.

The application layer of Dell's direct model is its Web site, dell.com, launched in 1994. This Web site was the first e-commerce site to record a million dollars in online sales. In the last quarter of 2002, dell.com logged a billion page visits, company's first.

Many other companies have imitated Dell's strategy of selling over the Internet directly to the customers with no middleman. The number of choices and control offered to customers are important reasons for dell.com's success. Within minutes a customer can configure a computer system piece-by-piece, choosing components like hard drive size and processor speed based on budget and need. This direct contact with consumers gives Dell a competitive advantage since it has no need for distributors and sellers unlike HP and IBM that do not manage their own sales channels.

Dell's core focus is its direct e-commerce model; it uses its Web site not only for B2C but also for B2B transactions. When decision makers have consistently good experiences through dell.com, the B2B sales channel is enhanced. The B2B sales channel is enhanced by consistently good experiences business decision makers have as consumers through dell.com.

The efficient front end, however, is not the only reason for Dell's success. Even with the best e-commerce experience, if the supply chain can not meet the promises made by the sales force, there is no way to be successful.

Dell's outbound supply chain is calibrated to respond closely to orders from the front end. Inventory is kept in the factory for two hours or less. Dell has no central warehouse facility and ships to customers directly from its manufacturing plants. Based on customer location, a shipment may originate from a Dell plant in Ireland, China, Brazil, Malaysia, Texas, or Tennessee.

1.3.2 Outbound Logistics Department

Outbound Logistics Department handles the end of the customer relationship lifecycle for finished goods and S & Ps shown in Figure 2. In a typical year fifty five million boxes are delivered by the Outbound Logistics Department using around twenty five thousand dedicated trucks.

The department's mission is to have a clear visibility of the shipped items, a crisp delivery to the customer and a reduction of returns to zero. Working with logistical service providers like United Postal Services (UPS) and Eagle, Dell provides the customer with many delivery options: next-day business delivery, second business-day delivery, third business-day delivery and three to five business-day delivery. The department has around twenty five employees and the director of the department reports to the vice president of logistics. The department is divided into two sub-groups: customer delivery services, where the internship was completed, and outbound logistics

operations. These two groups have a flat organizational structure, which empowers the employees. This type of structure positions the employees as individual contributors and helps them to be more efficient in cross-functional teams. Since the CDN project required sharing information throughout Dell, especially during the business-case development stage, this organizational design helped the project maintain alignment with the department's strategy.
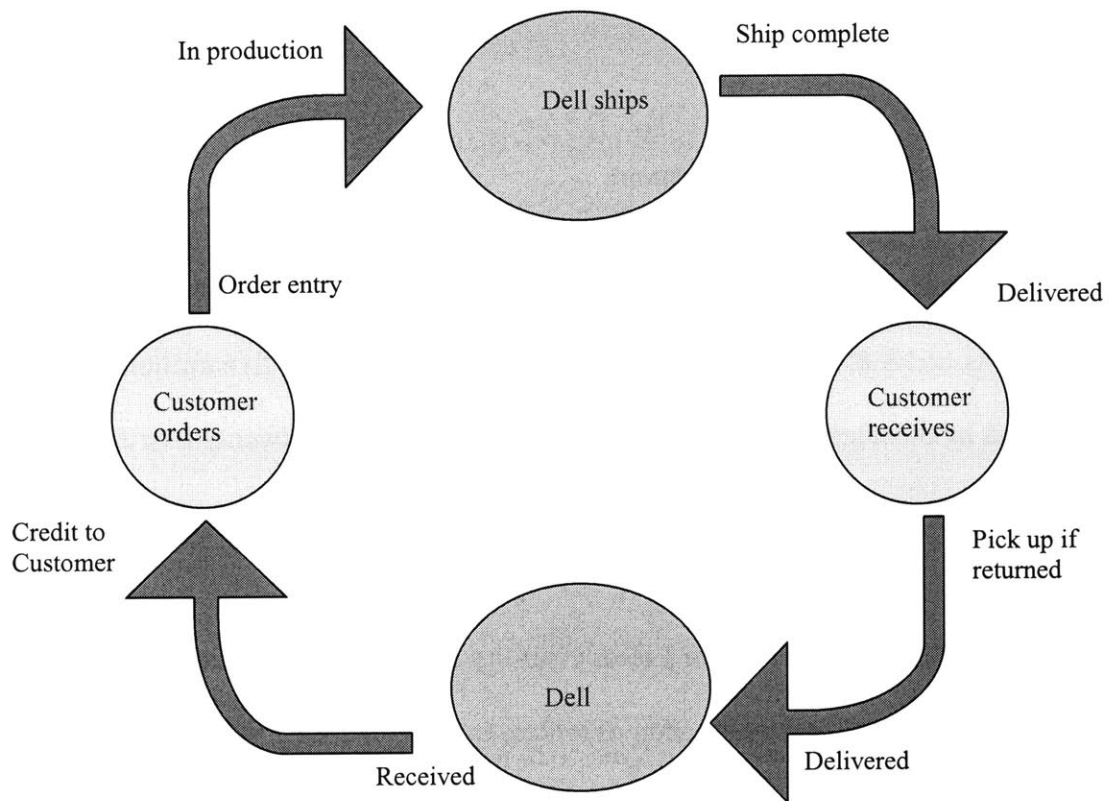
Figure 2: Customer relationship lifecycle

1.3.3 Culture at Dell

A cultural analysis of a company examines the symbols, values, and traditions in the organization, and it analyzes how these items impact the organization. As in many other

companies, Dell's culture not only affects how projects are selected but also how project work is executed. Based on Klein's framework of analyzing a company's culture, Dell's culture can be summarized as follows:

- **Technocratic—Data is the driver approach:** People throughout the company, including in Outbound Logistics Department, consistently look and dig for the best data and analyze it using various decision-making tools.

- **Lateral structure for relationships—Dell has a family atmosphere:** People are willing to talk and help each other with different projects. However, willingness to talk to other parties is less evident when there are similar projects running in different departments. This is due to Dell's incentive system: each department is valued at the end of the year based on how much money it has saved via cost-cutting.

- **Merit based support—Show me what you can do approach:** One needs to prove his/her credibility before anybody starts to listen. Even proving oneself in something different than typical tasks helps to build credibility.

Dell places a strong emphasis on culture, and many employees value the company's culture as one of their favorite things about working at the firm. It is not a coincidence that "Winning Culture" is one of Dell's main strategic initiatives. Another aspect of Dell culture is the entrepreneurial style, driven mostly by the style of the company's founder, Michael Dell. All these cultural factors help facilitate the cross-departmental coordination and smooth and efficient information flow, unless there is a conflict of interest in

concurrent parallel projects. It should also be noted that, although people throughout Outbound Logistics, and Dell in general, share many common values, cultural differences do exist among the groups. Another characteristic of Dell's culture worth mentioning is its preference for IT applications as stand-alone spot solutions rather than overall IT solutions.

1.3.4 Projects and Teams at Dell

There are various Business Process Improvement (BPI) projects all over Dell. The teams formed to work on these initiatives are usually cross-functional; members are selected from various work groups, and each member does some individual work and then discusses these during meetings. Although this cross-functionality causes physical separation of team members, teams meet on a timely basis depending on the situation of the project to talk over various issues and update the other team members on the progress since the last meeting.

As mentioned above, while a project team is formed by various departments the department that was the project originator owns the project. The project originator leads the project and gets inputs from all other departments involved in the project. The Outbound Logistics Department originated the CDN project and, hence, was its lead, but all groups involved agreed to share costs and gains. The CDN project team was composed of people from Dell Home Sales (DHS) and America's Business Units (ABU) and the Outbound Logistics Department. Being physically separated and having to report

to their specific vice presidents, these three departments' roles as key stakeholders slightly slowed the project's pace.

An IT steering committee determines which projects are implemented at the Logistics department. This committee weighs the tangible benefits by examining the business case for the project's cost-benefit analysis of the project and whether it aligns with the current IT structure. Although sub-group leaders have the power to sell projects and make minor budgeting decisions for their group, big decisions have to go through the vice president of logistics and the IT steering committee. In addition to having decision-making power, the vice president of logistics, gains authority from being well-liked and being seen throughout the department as a very smart person. Vice president of logistics shares his authority by considering other points of view and logical arguments aimed at improving the department's metrics. The amount of power held by other people in the department depends largely on their ability to communicate with the steering committee, especially on heavily IT-involved projects. The concentration of power in IT hands means that IT is very important to Dell, which aligns very well with Dell's overall values: IT is king and, it is the reason why Dell has achieved its current status. IT helped Dell to optimize its supply chain and be successful.

2. PROACTIVE NOTIFICATION

2.1 Chapter Overview

This chapter provides a history of proactive notification followed by an overview of technology providers and characteristics of proactive notification technology users.

2.2 Proactive Notification History

Just as there have been various ages throughout human history, have there been various economics ages since people started to sell and buy things. First, there was an old economy age, then the industrial age followed by the computer and information ages. The next in this sequence, which clearly places the consumer in control, is the customer age. In this new age, conventional metrics such as Profit and Loss (P&L), Return on Assets (ROA) and Return on Investment (ROI) will be replaced customer loyalty and customer long-term value. In this new age, customers demand that a business be easy to work with and ready to combine easy communication with easy transaction processing. A key success to these requirements is proactive communication. Most of the interaction between companies and their customers are inbound and, therefore, reactive since the customer starts the communication. The resulting high volume of incoming calls increases the cost of call centers and customer frustration. These problems can be preempted by proactive notification.

Proactive notification is defined as the communication initiated by a service provider or manufacturer before a customer calls the company regarding any business he/she may have with the company. Proactive notifications first started with telemarketing, to inform

customers about new products and promotions, collection agencies to shorten the credit recovery process since as debt ages the probability of recovery decreases. However, competition to increase customer base and to maintain a high customer retention rate coupled with advancements in information technology resulted in proactive communication technology's increased use in other business areas, such as the airline industry and financial institutions.

"For companies in any industry, a good proactive, outbound customer communications program can be a tremendous competitive advantage", stated the Chief Executive Officer (CEO) of one of the notification technology providers studied during the technology provider selection process. This quote enforces the idea that in today's environment companies that deal with large volumes should look for innovative ways to automate their interactions with their customers since a company's profitability depends on good business relationships with its customers. Good relationships with customers depend on how the customers value the company, which in turn depends on two things: the quality and the speed of their interactions with the company—a phenomenon that Dell calls the customer experience (CE). These two criteria force companies to explore innovative ways their communications can be more effective throughout the customer relationship lifecycle.

2.3 Technology Providers and Their Users

As mentioned in Section 2.1, proactive notification was first used only by large outbound-communication-focused industries, such as telemarketing and collection

agencies. However, in today's environment where there are an increasing number of competitive alternatives for their products, companies are competing for other's customers, and, thus, it is more important than ever to build a deeper customer relationship. Since recruiting new customers is so much costlier than retaining them, proactive contact with customers and relationship-building throughout the relationship lifecycle are now business necessities. Some marketing research showed that it cost six times more to sell something to a prospective customer than to sell the same thing to an existing customer. Therefore, it is more important than ever to stay in contact with—and provide more value to—customers by implementing proactive notification solutions. The key to success is talking to customers in a timely and efficient manner; if it is not handled properly, customer experience can have a negative effect on the company-customer relationship.

Today proactive-notification technologies are commonly used in various industries, such as by banking and financial institutions, collection agencies, retailers, newspaper companies, airlines, healthcare, and telecom companies. In the airline industry, proactive notification is used to inform customers about future flights, rebooking, itinerary changes, etc. It is also used to send a message to a passenger's colleagues, spouse, and friends so that they may know when to meet the passenger at the airport. In banking, proactive notification is used to pass critical account information to customers in circumstances such as when a payment is due, a balance falls below zero, and so on. In healthcare, proactive notification is used mainly as an appointment reminder.

Ten different companies were examined during the search for available proactive-notification technology providers. The list was cut down to a three for more in-depth interviews and analysis. Below is some information about these companies. Because information provided by these companies will be used later in this thesis, for confidentiality reasons companies' names are withheld.

Company one (C1) was established to address the complex challenges faced by large corporations when communicating important information to their customers. C1's pioneering vision—which remains at the heart of who they are and what they do today—is to provide an automated communications platform that companies could leverage to proactively interact with customers over any channel, including voice, e-mail, wireless text, facsimile and instant messaging. This platform was designed to help companies easily work with existing Customer Relationship Management (CRM) systems that manage event data, sophisticated business rules and user subscriptions, all while tying seamlessly communications back to the call center where appropriate. C1 has been providing notification solutions to Fortune 1000 clients in numerous industries since 1999.

Company two (C2) provides enterprise notification solutions that are designed to help organizations streamline interactive voice and text communications with customers. Organizations utilize C2's automated notification and message delivery solutions to drive proactive customer care efforts, streamline supply chains, and facilitate business continuity initiatives. C2 facilitates personalized, fully interactive voice and text

broadcasts to landline phones, faxes, e-mail, pagers, Small Message Services (SMS) and Wireless Application Protocols (WAP), phones, Personal Digital Assistants (PDA), BlackBerrys and other wireless devices. C2 has developed a high-volume, high-availability communications platform that is scalable, reliable, and secure. C2's key customers and partners include various companies across different industries.

Company three (C3) has the vision that the future of CRM lies in proactive, personalized customer communications. C3's enterprise solutions help businesses actively engage customers in a one-to-one relationship. C3 has a proven track record of successfully providing proactive notification services to large customers with a scope and complexity similar to those of Dell. C3's vast majority of customers are Fortune 1000 companies.

These companies are all recent start-ups, privately held, and supported by venture capital companies. The technologies provided by these companies are very similar in terms of functionality, architecture, and tools, as will be discussed later in this thesis.

2.4 Chapter Summary

Proactive notification is a recently discovered tool that enables various companies across many industries to stay in touch with their customers. Due to its popularity, there have been a lot of recent start-ups trying to tap into this market to serve big corporations. While most of the technologies offered by various providers are similar to each other, a company should pay the utmost care to which one of these start-ups it employs given the fact that the selected platform will help manage the customer relationship, which is the

most important criteria for success in today's business environment. Because it indirectly involves entrusting the customer relationship to a supplier, this decision is much more important than selecting a component supplier with low cost and good quality.

3. ANALYSIS AND BENCHMARKING STUDY

3.1 Chapter Overview

This chapter will discuss the analysis of the current notification system, why this project was initiated, detailed benchmarking steps done during the internship, and elaborate on how the proactive-technology provider evaluation was done.

3.2 Analysis

Dell, as the number one PC manufacturer in the World, strives for better results through various Business Process Improvement (BPI) projects. For one of these BPIs, Dell wanted to evaluate the benefit of increasing the first-time delivery percentage by contacting its customers to confirm the expected delivery date of their products. Dell started a pilot program, and, based on the results of which, the company developed a business case to determine the tangible benefits of implementing proactive notification technology.

3.2.1 Current Notification Approach

In its order-fulfillment process, Dell sends three e-mail messages to customers: first an order-acknowledgement e-mail, then a confirmation e-mail, and later, a shipment-notification e-mail as shown in Figure 3. The current customer communication process, shown in Figure 4, consists of one-way communication that is ineffective in today's customer-centric economy.
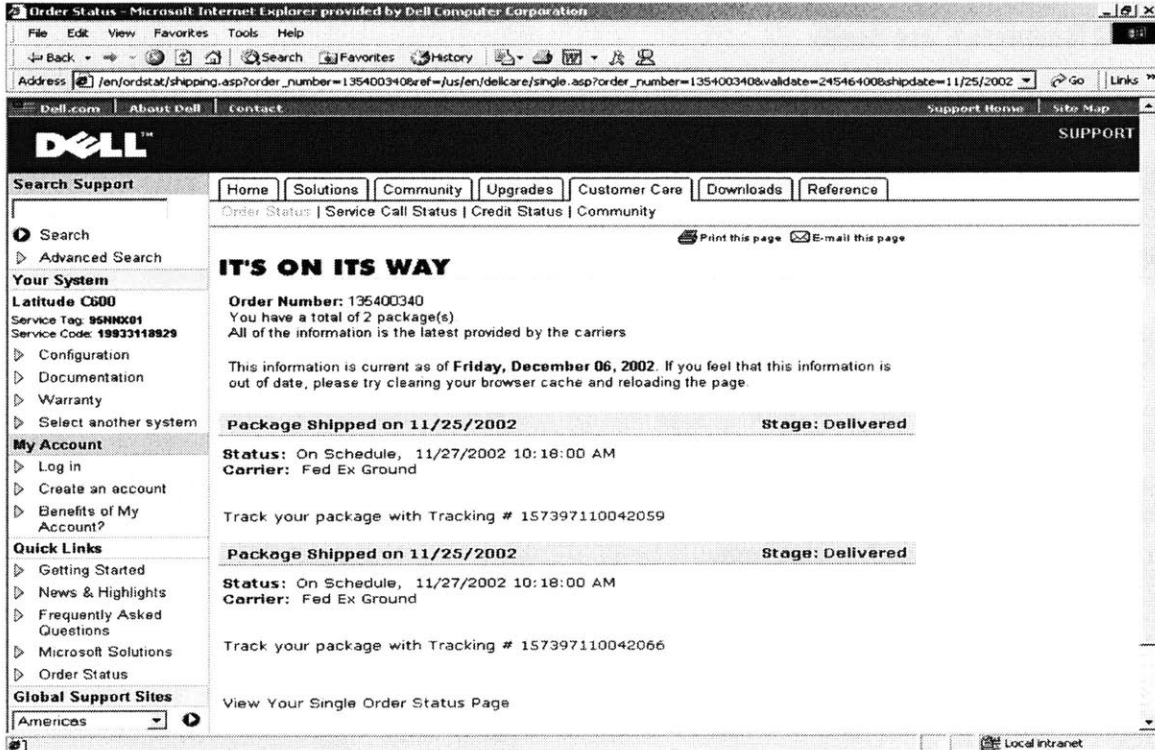
Figure 3: A sample snapshot of shipment-notification e-mail sent to customers

DS: Distress shipment
LDR: Logistic data repository
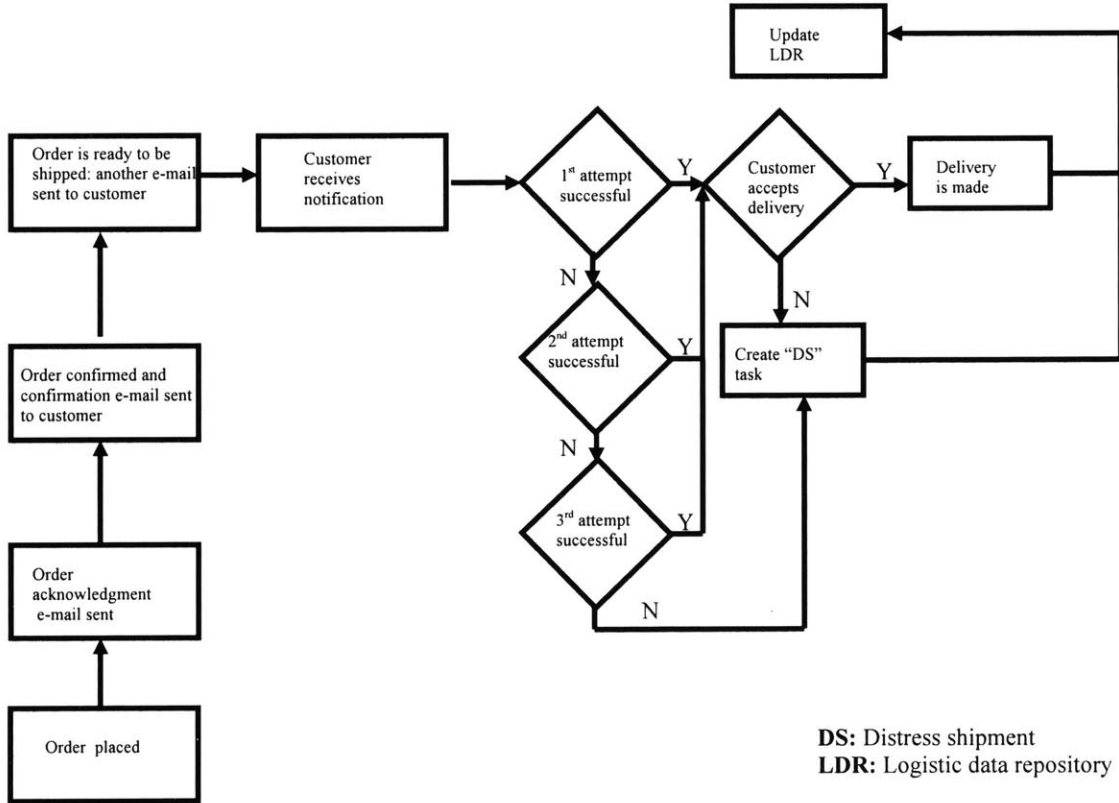
Figure 4: Current process map of customer notification

3.2.2 Business Case Study

Like any other company, Dell's internal regulation requires that a business case be developed before a BPI initiative can be implemented. Thus, as previously stated, a business case that considered the improvements demonstrated in the pilot program was formed to analyze the return on investment achieved by implementing a proactive-notification technology platform. However, it was understood that in addition to the tangible monetary savings, there would also be intangible benefits accompanying the implementation of such a platform.

3.2.2.1 Tangible Gains

Three main items were analyzed with respect to tangible gains. First, the gain from increasing the first-time delivery percentage was calculated. In order to increase the first-time delivery percentage, Dell had to work with one of its main carriers and negotiate a gain-sharing contract. The negotiations took several months to establish the metrics to be used and to finalize the gain-sharing structure. Increasing the first-time delivery percentage eliminates cost in the supplier's network. It also increases customer satisfaction since customers receive their product on the first delivery attempt.

Second, the reduction of incoming call volume to the customer care center was quantified. It is widely know that the cost of an incoming call is much higher compared to the cost of an automated outbound call since the former includes a huge amount of labor cost compared to capital investment required for the latter. This cost discrepancy is

one of the main reasons why companies with large merchandise volumes want to implement a proactive outbound-notification technology.

The last item to be analyzed was the reduction of hard refusals by the customer. Although this piece was not an intuitive result of a proactive notification solution, the data from the pilot showed that there was a significant reduction in returns during the pilot period compared to what it was in the same geographical area before the pilot.

3.2.2.2 Intangible Gains

Quantifying the intangible benefits of implementing a proactive notification-technology platform was the most difficult part of the project. In order to easily understand the benefits, a system dynamics casual-loop diagram, as shown in Figure 5, was developed. This model includes two intangible benefits loops (word of mouth and customer retention) and three tangible benefit loops (gain sharing with carriers, talking more to customers and returns). It should be noted that all five loops are reinforcing loops that increase customer satisfaction and, hence, increase the sales and profit of the company.
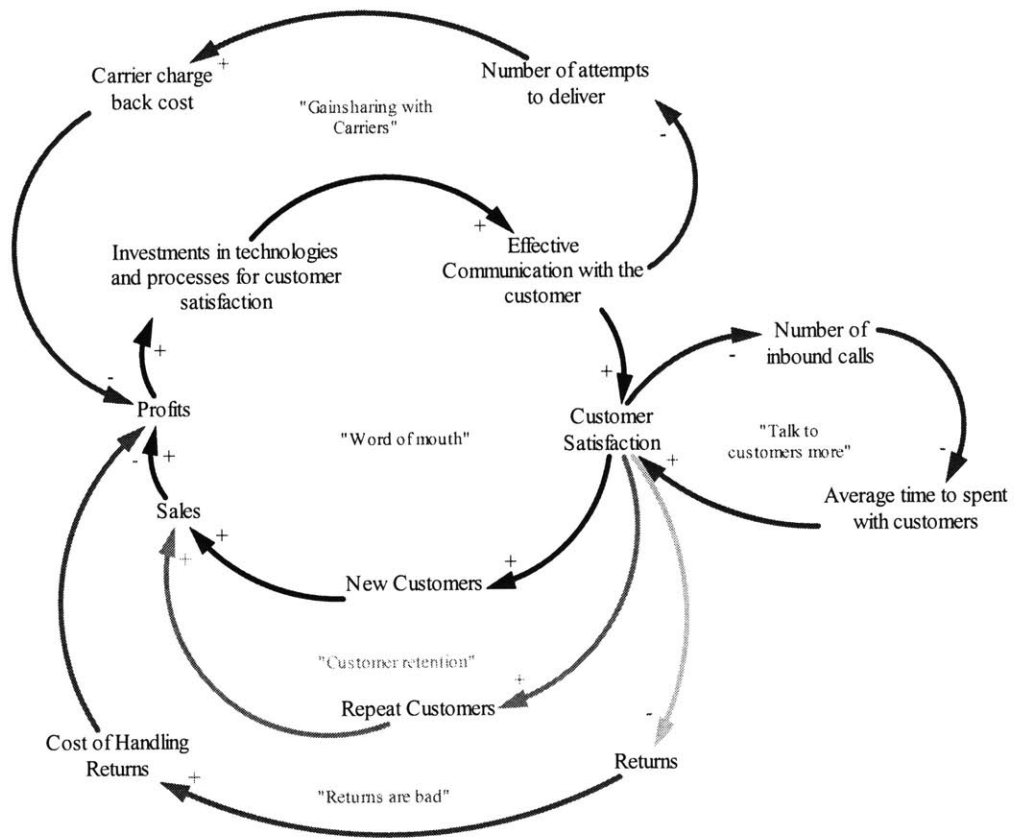
Figure 5: A casual loop diagram of the tangible and intangible benefits of implementing a proactive notification technology platform

3.3 Benchmarking Methodology

Dell has its own process for sending outgoing benchmarking requests and accepting incoming benchmarking requests from other companies. During the internship benchmarking process, steps were followed to an outgoing request. It was discovered that Dell needs to work with other companies to learn more about proactive-notification technologies and their usage. Steps of the benchmarking study will be explained in the following sections.

3.3.1 Benchmarking Definition

The American Productivity and Quality Center (APQC) defines benchmarking as a useful business practice that basically means learning through comparing in a structured way that can cut through and across cultural, industry, size, and functional boundaries to identify usable high-performing practices. There are two main types of benchmarking:

1- Performance/competitive benchmarking: comparing the performance levels of organizations for a specific process. This information can then be used to identify opportunities for improvement and/or setting performance targets.

2- Process benchmarking: organizations search for and study other organizations that are high performers in particular areas of interest. Process benchmarking involves the whole process of identifying, capturing, analyzing, and implementing best practices.

3.3.2 Approach

Process benchmarking was performed during the internship project. However, first, best-of-breed notification technologies and their providers were identified, and, then, their customers-notification processes were analyzed—reverse benchmarking in some sense. During this process, APQC's four-step approach was used. In the following sections, each of these steps and the work done for the project are explained.

3.3.2.1 Planning

Extensive research was performed to identify types of notification technologies, how they are used, and who are the providers and users of these technologies. Ten companies were

identified, and after an initial review based on things like business cases, white papers, and company brochures, the number of companies was cut down to three. These three companies were contacted for further study.

3.3.2.2 Data Collection

In his book *Benchmarking: The Search Industry Best Practices that Lead to superior performance*, Robert Camp shows that there are six different ways to collect data, as shown in Figure 6. From bottom to top, each of these methods requires more preparation and creates more excitement than the one below. However, Camp emphasizes that researchers should be cautious that while teams may be enthusiastic about site visits to other companies, eighty percent of benchmarking studies do not need a site visit to be successful or to discover new ideas for performance improvement.

Site visits

Personal contacts

Database searches/secondary searches

Public domain information

Internal information and expertise

Basic scanning of possible organizations

High

Low

Performance   **Excitement**

Figure 6: Different means of data collection during benchmarking

Because of Camp's comment and resource availability site visits were kept to a minimum.

Data was collected in three different stages, as shown in Figure 7.

Stage I   **Stage II**   **Stage III**

Stage I: Preliminary screening

Stage II: Request for Information (RFI), questionnaire development

Stage III: Demonstrations, RFI responses, conference calls, site visits

Figure 7: Different stages of data collection

Stage I: Preliminary technology provider screening was done as quickly as possible to determine a list of providers. This list was then cut down to five companies based on four different key criteria:

1- Current technology

2- Integrated solutions

3- Financial and management stability

4- Variety of customers from various industries

Stage II: In this step, data-collection tools, such as RFI and a questionnaire, were developed to gather data from these five providers about their technologies and about their clients' business practices. A sample questionnaire and RFI are shown in Appendix A. While the RFI is a standard, questionnaires were customized based on nature of the business being studied.

When used effectively, an RFI can help organizations acquire the best value for products or services. When creating the RFI, some reasonable mandatory or primary requirements were identified in order to encourage response rate. There was concern that otherwise nobody would reply to the RFI because cost might be too high. Also during RFI creation, a pro forma selection list was put together based both on previous work at Dell in the same arena and on searches done at various channels. The aim of the RFI was to identify companies that meet all mandatory requirements and provide the best value, while not necessarily being the lowest cost supplier.

In more detail, the RFI's purpose was to capture:

- Functionality of the technology

- Architecture and tools supporting the technology

- Financial viability of the company

- Total cost of ownership

- Implementation approach

On the other hand, the questionnaire's purpose was to capture the following information from the users during the site visits and conference calls during site visits and conference calls:

- Company's background and operations

- Architecture and technology

- Evaluation of their partnership with the technology provider

- Implementation challenges

- ROI on their notification technology

Stage III: In this stage, companies were asked to supply more information about their technologies by giving demonstrations.

3.3.2.3 Data Analysis and Reporting

RFI responses, together with data gathered from questionnaires and demonstrations, were used to evaluate these technology providers. The evaluation process was done using an evaluation spreadsheet, as shown in Appendices B through D. The goal of the spreadsheet was to analyze who would be the best notification technology provider. For this reason, it evaluated the possible providers in different respects, taking demonstrations, site visits, conference calls, other communications, and RFI responses into consideration. However, it should be noted that the spreadsheet gave only an overview of these companies, a more detailed analysis was needed especially in the areas of functionality, architecture and tools, requiring greater involvement from Dell's IT department.

The parameters driving the selection process included three main categories, as shown in Figure 8: functionality, financial viability, and architecture and tools. The first one was selected because Dell seeks a solution that is responsive, focused, and resilient. Financial viability is important because, like any other company, Dell wants to build a relationship with a company that has excellent prospects for the future. As far as the last criteria goes,

Dell prefers to work with companies using architecture and tools similar to what Dell currently uses.
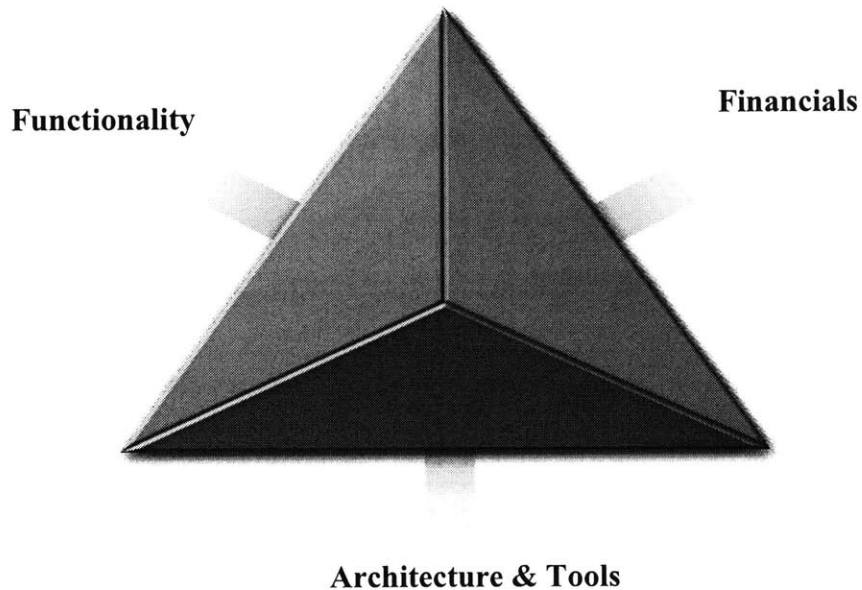
Figure 8: Main criteria in selecting a technology provider

A comparative scoring approach was used in the company evaluation. Each valid response from a provider was evaluated against the responses from the other two companies, rather than compared against commonly accepted rules/requirements as in consensus scoring approach. A one to five scale, with three being the medium grade, one being the lowest, and five being the highest, was used for scoring. For cases where the company did not comply at all with requirement, zero was given for that criterion. It is also worth mentioning that, although utmost attention was given, scoring of the qualitative components in the evaluation was somewhat more subjective than the scoring of the quantitative components.

The following scoring scenarios were used:

- Each response is very different from the others: best gets five, worst gets one and mediocre gets three.

- Two of the responses are close to each other and they are much better than the other response: the two get five , the other gets one

- Two of the responses are close to each other and they are not much better than the other response: the two get five , the other gets three

- One of the answers is not much better than the other two and these two are close to each other: the better one gets five and the other two get three.

- One of the answers is much better than the other two and these two are very close to each other: the better one gets five and the other two get one.

- All three are very close to each other: all get five

Note that a score of five does not affect the final result in a weighted evaluation system. It only changes the overall weighted average score of the companies, not their ranking. For example giving a score of five to all three companies in this type of scenario results with scores such as three, three and a half and four for each company. Had the companies been given one or three rather than five, their final weighted scores would have been lower than three, three and a half and four, but the order would have been the same.

In this scoring methodology, some facts, such as having a factor of ten between the availability numbers of 99% and 99.9%, were also carefully taken into consideration.

The evaluation spreadsheet includes the following sheets:

Summary sheet (Appendix B): As its name implies, this sheet summarizes the contents of the other sheets. The percentages, weighting factor of each criterion, shown in cells can be changed depending on how the seven different criteria are valued. The raw scores given for each criterion represent the total score gained by using the one-three-five scale. Weighted scores correspond to the overall weighted scores based on sub-criteria percentages shown on the Scorecard sheet.

Scorecard sheet (Appendix C): This sheet examines in greater detail each main item listed on the summary sheet. The goal of this sheet is to calculate the overall weighted average of each company for each criterion; these numbers are shown at the bottom of each criterion. Weighted scores are calculated by multiplying the percentage of each sub-criterion with the raw score. For example, if all providers answer the question whether they have e-mail notification available on their platform, they all get a raw score of five.. Their weighted score of 0.294 is calculated by multiplying the sub-criterion's percentage, 5.88%, with the raw score of five. To calculate each sub-criterion percentage the following methodology was used: First, under each main criterion, sub-criteria are marked as a primary, secondary or tertiary factor in evaluating the main criterion. These are shown as "(1)", "(2)", or "(3)" next to the sub-criteria definitions. Then, based on the number of primary, secondary and tertiary factors, a whole 100% is divided between sub-criteria by assuming that a secondary sub-criterion carries half as much weight as a primary and that a tertiary sub-criterion carries one third as much weight as a primary. For example, for "Total Cost of Ownership" (TCO) there is one primary, one secondary and one tertiary sub-criterion. It should be mentioned that there are reasons why each sub-criterion is rated primary, secondary or tertiary. Therefore, if a primary factor has six

points, then a secondary factor has three points and a tertiary factor has two points. The overall points for the TCO criteria Is six plus three plus two, which is equal to eleven.

Thus, primary factor, (1), has a percentage weight of 6/11= 54.55% on TCO calculation.

Secondary factor, (2), has a percentage weight of 3/11= 27.27% on TCO calculation.

Tertiary factor, (3), has a percentage weight of 2/11= 18.18% on TCO calculation.

TCO_C1, TCO_C2 and TCO_C3 Sheets (Appendix D): These spreadsheets show the total cost of ownership for each of the vendors. In these sheets, a pricing model was created based on the information given by each vendor. For a fair comparison of total cost, a monthly volume of 1.5 million notifications with the following distribution was assumed: 70% Voice, 20% e-mail, 10% SMS and no Fax or Instant Message (IM).

While the parameters used in this spreadsheet were chosen to reflect a scenario close to Dell's current situation, they can be modified according to the assumptions and notes shown on the spreadsheet if different notification-methodology scenarios need to be used.

3.3.2.4 Findings

In order to find the best vendor, not only did the technical features of the different platforms need to be evaluated but also vendors' agility in their project management, their flexibility in offering a seamless approach in design and integration, their overall professionalism, and their financial viability. All of this was captures in seven criteria: functionality (25%), architecture and tools (25%), references (5%), total cost of

ownership (10%), financial viability (25%), RFI responses and demonstrations (5%) and implementation (5%).

Part I: Functionality

In this part, the functionality of the solutions proposed by vendors were evaluated. The functionality sub-criteria are clearly defined, as can be seen in the scorecard spreadsheet, and responses are scored according to the above-mentioned scoring system. As in many IT projects, functionality is one of the main criteria for automated proactive notification technology, and, thus it is given a 25% weight in overall scoring.

Finding: The evaluation of the responses determined that there are few differences in between the vendors. C1 tied with C2 in this criterion.

Part II: Architecture and Tools

Hardware, software, and information transportation security comprise features pertaining to architecture and tools, analyzed in this part of the research. Similar to functionality , architecture and tools are another main criteria for this project, as in many other IT project, and thus also given a 25% weight in overall scoring.

Finding: Solely based on this criterion, C3 seems to be the best provider, followed by C1 and then C2. It was also noticed that there is a recognizable gap among the weighted scores, i.e. scores are far apart from each other unlike in the functionality criterion.

Part III: References

All other criteria aside, a vendor is most likely to be a good partner in the future if it has been a good partner in the past. Reputation is formed by how a vendor's past and current customers perceive it. The perception is usually shaped by objective and subjective assessments of the vendor's real attributes. Also, it must be noted that perception can not be quantified, and it can be strongly affected by proactive efforts made by a vendor, such as through marketing and advertising.

A good test of a company's willingness and effectiveness to provide a good service is to look at its current customers. Hence, the companies were asked to give references. In essence, this process can be seen as "word of mouth" working backwards. Providers of automated-notification technologies have difficulty differentiating themselves from their competition, and, thus, references must play a role in the evaluation process. Reference criterion constitutes 5% of the overall scoring. The key point here, however, is to recognize that references may have been "hand-picked" and may not have been objective. Therefore, judgments in this criterion were made more carefully. The following items were considered for each vendor under the reference criterion:

- Ratio of succeeded attempts to overall attempts made to reach its references
- Strength based on its customers' feedback
- Weaknesses based on its customers' feedback

Finding: There do not seem to be a lot of differentiators between the vendors with respect to the last two criteria shown above. The only difference was seen in the success rate in

reaching C3's references, for which C3 worked hard. In this criterion, C3 is followed by C2 and then by C1.

Part IV: Total Cost of Ownership

In this part, the total cost of ownership of the technologies was analyzed. Except for C2, the providers offered two options for the ownership of their products, hosting and in-house. Since the first-year cost includes some implementation expenses that can vary from company to company the second-year cost was also examined The average of both year' costs was taken and used in pricing models. In these models, if everything else stays the same, the cost should be the same after the first year, and an average over a longer period could have been taken. However, this is not a realistic assumption because possible changes in the cost structure would result in changes in the number of notifications in the division of media methods. In this criterion, the cost of a pilot program was also taken into consideration even though it is not a major factor in the final selection process.

Finding: C2 seems to offer the best pricing for the hosting model, whereas C1 seems to offer the best for the in-house model. While C3 does well in many other criteria, they do not perform well in this criterion. They are roughly twice as costly as the others for the hosting model though this issue can be raised in future communications with them.

Part V: Financial Viability

As can be seen in the scorecard sheet of the vendor evaluation spreadsheet, there are various sub-criteria, such as years of experience in the business, revenue growth, and sales per employee, that are considered in assessing financial viability. All these sub-criteria are used to get an approximate idea about the financial viability of the companies. For example, while a certain period of experience in a business is not a perfect indicator of a company's financial viability, it is a useful data point that tells something about the company's legitimacy. It is an indicator of customer loyalty, which is not gained easily. Unlike with some "old-economy" businesses, temporal experience for innovative-technology and software companies is even more highly valued by companies seeking the formen's services. After all, a company's survival depends on its vendors being around in the future to provide support and service.

It is a fact of life that small companies go out of business more often than larger ones, and younger companies go out of business more often than older ones. In the proactive-notification technology industry, the providers are both small and new companies, and this increases the probability that these companies may go bankrupt easily. Therefore, a vendor's financial viability is a very important criteria, which is why it is given a 25% weight in overall scoring. Unfortunately, determining the financial stability of a company is not an easy task, and only an approximate idea was developed.

Findings: C1 seems to be the most financially stable company. C1 is followed by C2 and then C3.

Part VI: RFI Responses and Demonstrations

In this part, overall response quality, the companies' professionalism, their effectiveness in demonstrations and their responsiveness and eagerness were captured. Only 5% weight is given to this criterion.

Finding: C3 seemed to excel in this respect, followed by C2 and then C1.

Part VII: Implementation

The companies' effectiveness in implementing the desired technology was captured under this section by examining their roll-out strategy, timeline, and their training and knowledge-transfer approaches. Only 5% weight is given to this criterion.

Finding: There was no great differentiator between C2 and C3 in this regard, and both performed better than C1.

All these findings are summarized on in a spider network shown in Figure 9.
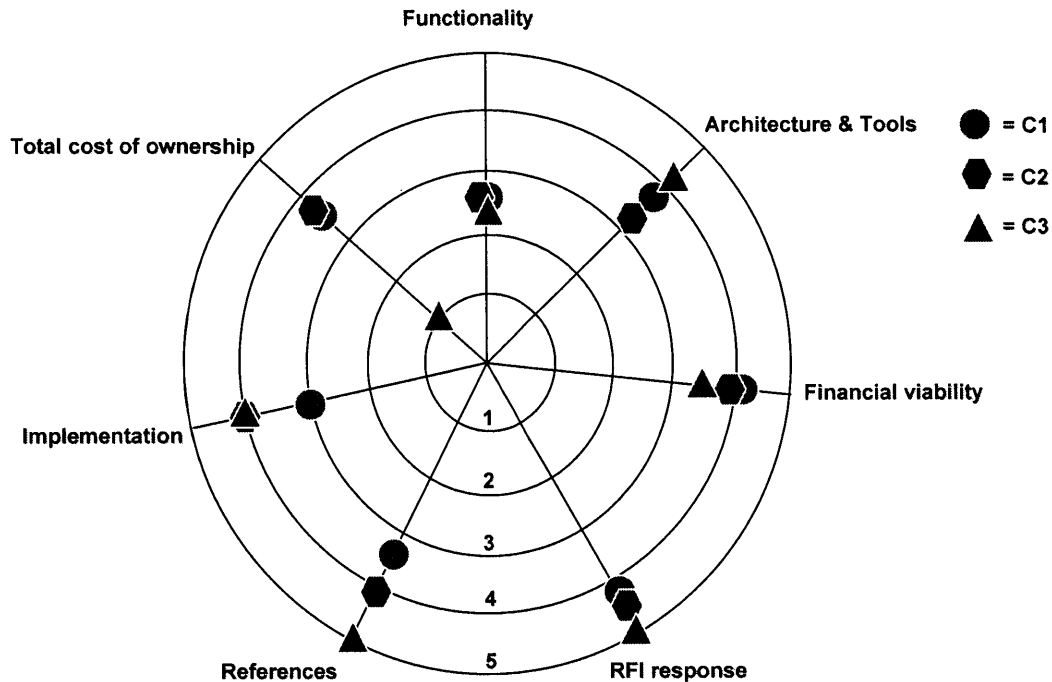
Figure 9: Company evaluation findings on a spider network

3.4 Chapter Summary

Based on seven criteria, Company One (C1) was the best vendor. While C3 was ranked

first in four different criteria, these were not highly-weighted criteria and thus did not

greatly augment C3's ranking. This shows that, based on the priorities that a company

sets for its vendor selection, the overall ranking can easily change. Thus a careful analysis

of the weighting factors for different criteria needs to be done.

4. IMPLEMENTATION

4.1 Chapter overview

In this chapter, first, the proactive notification implementation strategy and, then, the challenges that were faced will be discussed.

4.2 Implementation Process

The implementation of an automated proactive-notification solution was divided into three phases, as shown in Figure 10.

Phase I	Phase II	Phase III
Manual Solution	**Semi-Auto Solution**	**Automated Solution**
Manual	*Automated*	*Automated*
➢ Data collection	➢ Data collection	➢ Data collection
➢ Prioritization	➢ Prioritization	➢ Prioritization, if necessary
➢ Notification	*Manual*	➢ Most of the Notifications
	➢ All Notifications	
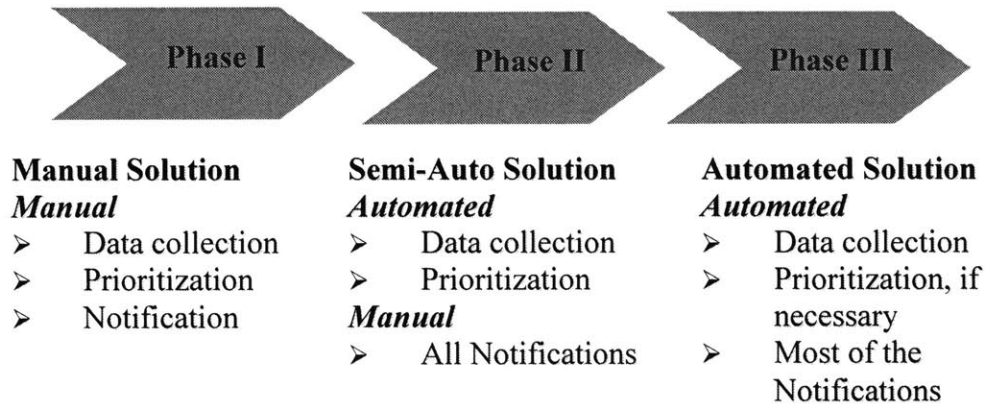
Figure 10: Implementation phases of the proactive-notification technology

Three different steps were performed: data collection, in which information was collected information about the customer, prioritization in first two phases of the implementation process to determine who gets the notification and when, and lastly, sending the notifications. For a smooth transition to the fully-automated solution in phase three, both a completely manual solution and a semi-automated solution were run in order to better understand the logistics behind each process.

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When a fully-automated solution is implemented successfully, the notification process

looks like the one shown in Figure 11.
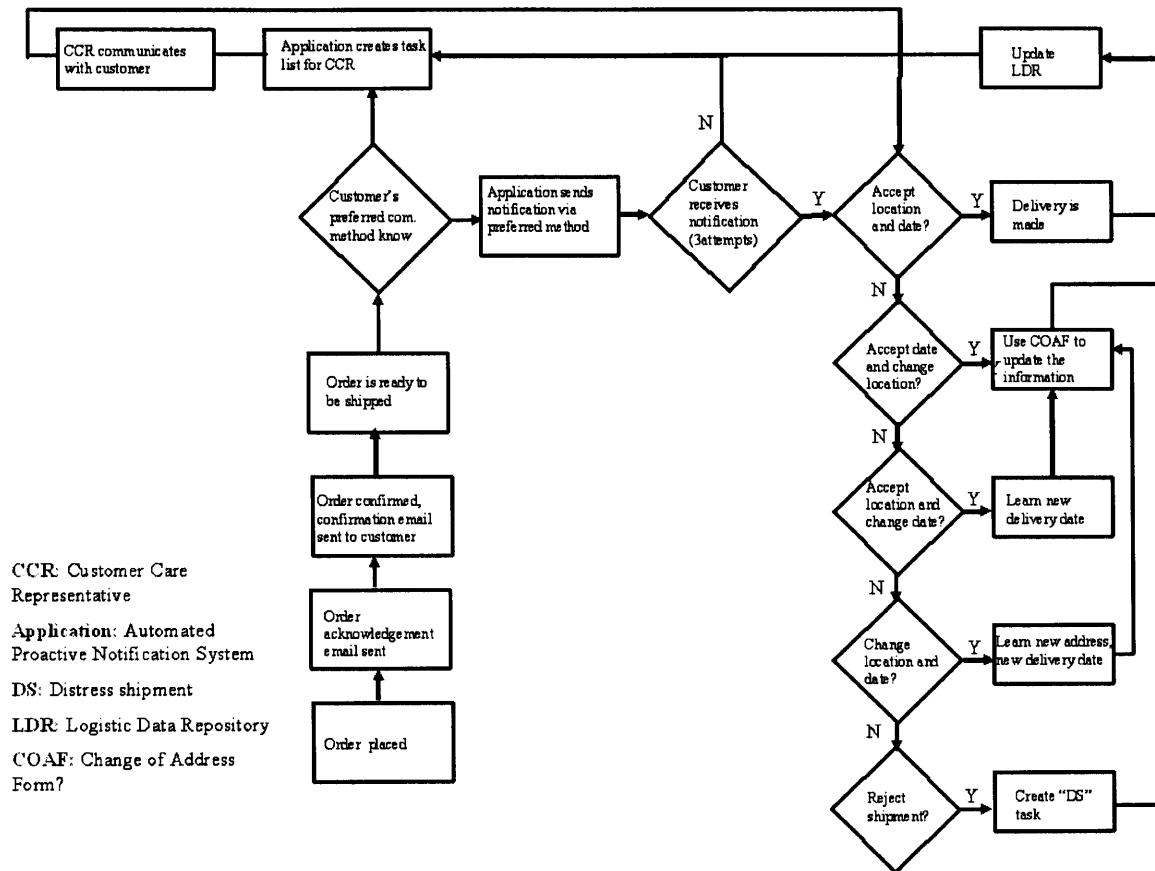
Figure 11: Process map of notifications after an automated solution is implemented

4.3 Challenges:

Phase I was launched after the internship was completed. The work done in preparation

for this phase and the benchmarking study indicated that there would be some challenges

in executing remaining phases. These challenges include:

- There is a time lag between when the physical package is sent and when the

  notification is transmitted: The contact process needs to ensure that

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communications sent promptly upon shipment and that all parties slated to receive an order notification get them in a timely manner.

- The structure and wording of the communications should be organized so that these accommodate various types of orders and customers. This is a challenge because a menu that seems reasonable for one customer may not be so appealing or easy to use for another. Also, the notification wording should accurately and clearly communicate tracking numbers to the customer. Complex orders with multiple packages deserve special attention and may warrant their own process.

- Careful coordination must be arranged with the carrier companies. Dell uses a Change of Address Form (COAF) when a customer makes a change related to the delivery location. This change is communicated to the parcel carriers. However, these companies do not check for exceptions when they receive the package, and, thus, they make the delivery to the end customer regardless of any updated information. Even though this issue was raised during negotiations, it will take time for carriers to adopt their process and fully recognize any changes made to an order when it is in the transportation network.

- Implementing a proactive-notification platform is only a partial IT solution rather than an integrated IT solution, which may cause problems in the future.

4.4 Chapter Summary

This chapter discussed the implementation strategy and its related problems that were both encountered and anticipated for the future.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Recommendations

Recommendations resulting from the internship's study can be categorized into two groups, primary and secondary. The items in the former are vital to a company's successful implementation of a proactive-notification technology platform, whereas items in the latter group deal more with the platform's survivability.

Primary recommendations:

- Give the customer necessary information, such as order number and delivery date, as early as possible. Current proactive-notification technology users observed that not only does communicating late in the relationship life cycle confuse customers but so, too ,does giving the customer too much information, resulting in increased calls to the calls centers

- Capture and confirm during the order entry process the best time and method to communicate with the customer. Some proactive-notification users received complaints from customers that they had been contacted on their cell phones during inappropriate times, such as while traveling and in a different time zone. Had the company already captured the best time periods and methods with which to contact the customers, including some buffer time to account for unforeseen circumstances, such timing mismatches could have been avoided.

- Implement real-time integration rather than the flat file-type approach where data is fed into the proactive-technology platform in some intervals. Although

real-time integration is more complex, it enables smother data transfer between the logistics data repository and the proactive-notification technology platform.

- Keep some agents dedicated to manual solutions. It was found that most of the proactive-notification users did not get rid of their dedicated outbound call agents completely. Becasue there were still customers who wanted to talk to live agents. The reason for this is that if customers because they received a proactive notification, would not prefer to go through a customer care center that handles a lot of other different issues.

- Carefully program the retry logics internally about when to send follow-up notifications. This will reduce the information flow between the company and its proactive- notification technology notification provider. Consider this scenario where the platform does not detect a live response from the customer and leaves a message on the customer's voicemail. The customer then gets the message and calls the company back. The proactive-technology provider is not informed in a timely manner that the customer has been communicated the will receive another notification, possibly creating confusion. Therefore, by establishing the retry logics internally, a company can better control this type of situation.

- Make it easy for customers to communicate back to the company by using a voice recognition system. Proactive communication is much more effective when it is a two-way communication rather than a one-way communication, such as in many marketing-driven calls.

Secondary recommendations:

- Use the same proactive-notification structure, with some modifications, to communicate with both DHS and ABU customers. Some proactive-notification technology users, especially airlines, noticed that despite being in different customer segments, customer behavior is often the same. There is no need to complicate things by structuring different notifications for different customer bases.

- Hire or train internal application-development personnel to better understand and improve the application. If the platform is easily modified, having internal application-development personnel will facilitate adjustments to the technology based on customer need and experience.

- Use the same technology for marketing purposes, such as for time-sensitive discounts and rebates. Each company studied had a different critical reason for implementing a proactive-notification technology, but after a while, they all efficiently adopted the technology for new and different purposes. The implication for Dell is that the shipment-based proactive-notification technology can also be used in conjunction with current marketing tools in today's very demanding business environment.

- Track the success of the notifications and improve any weaknesses. Some of the companies studied did not track the performance of the proactive notification platform and, thus, did not see as big benefits from the technology as other companies that did track platform's performance.

5.2 Summary

During the internship, it was observed that while proactive-notification technologies are frequently used by financial institutions, insurance companies and airlines, these programs are not that commonly used by other industries. However, there is a trend in other industries, such as in retail and technology hardware, to adopt proactive-notification technologies to improve communications with their customers. Even though most of the industries that were studied were not part of the PC industry, their best practices to were both informative and applicable.

In today's consumer-centric economy, building relationships with the customer is vital to a company's success. One tool that can help achieve this is proactive notification technology. Proactive notification offers such benefits as significant cost reduction as a result of staff reduction and more informed, and thus, more satisfied customers. However, possible disadvantages that can accompany implementing an automated solution requiring further study include untimely or incomplete outbound calls, resulting in frustrated customers.

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APPENDIX A

REQUEST FOR INFORMATION (RFI)

SCOPE OF REQUEST:

Dell is pursuing a proactive customer delivery notification solution. In an attempt to identify and gain information on the various products available, we are issuing this request for information from your company. If you are interested in supplying a notification solution to Dell, please respond to this RFI in the specified time frame. Please note that <u>a reply to this request for information does not guarantee business with Dell or guarantee further engagement with Dell.</u> Your response to this RFI will be used to assess your product, to assess the competitive landscape, to help Dell understand what IT resources are required, to determine a feasible implementation timeline.

Please note the following items when you reply:

- Even though we may already have some of the requested information from you, please be as clear and complete as possible since this document will be used to compare the top two or three vendors for future evaluation.

- It is not necessary to respond yes to all yes/no questions in order to be considered further. Your solution can meet only some of the requirements and still be a candidate.

- Assume 1.5 to 2 million notifications per month for cost calculations. Please provide hosting versus non-hosting costs separately when necessary, such as for implementation and maintenance costs.

- Answer some of the questions, such as availability/uptime question, based on historical data you have from similar solutions that you have implemented.

- The response must follow the format outlined below and should be returned no later than 5pm central time, 17 September, 2004.

PART I: GENERAL

A-Please answer the following yes or no:

1-E-mail notification is possible

2-Phone notification is possible

3-SMS notification is possible

4-Messages to PDA and cell phone are possible

5-Messages to fax machines are possible

6-24/7 technical support is available

7-Speech recognition system is available for inbound calls

8-A pilot program can be tested before full implementation

9- Non-hosting is available

10-Turn-key solutions are available

B-Open-ended questions:

1-Please specify the platform's availability or uptime as a percentage

2-If scheduled service-interruptions occur, how long these last?

3-If unscheduled service-interruptions occur, what is your back-up plan? How long does it take to put the back-up plan in place?

4-Specify the platform's error rate, such as calling wrong numbers etc.? (Note that this question is asking about the error caused by the platform, not errors caused by the information supplied by Dell)

5-Explain whether you can provide additional notification capacity and how long it would take to make the necessary changes if extra capacity is needed. Please specify any capacity limitations you have.

6-Specify the current version/release number of your product and when this version was introduced to the market.

7- Are there any earlier versions of this product that are no longer supported? Please be specific about the release date of this product and its life on the market.

8-Approximately how often are major and minor revisions made?

9-Schedule: Please list all major milestones for the notification project design, such as implementation, testing, acceptance. Show the estimated completion time for each activity.

10-Please explain any characteristics of your platform that you think differentiate your product from the others and why this characteristic is important.

PART II: REFERENCES

Please give at least one (two to three preferred) reference for similar work done. If a similar project was not done before please specify as none. <u>DO NOT give a reference that uses another solution that you provided; it HAS to be outbound notification solution that uses different media to communicate</u>. Please include a contact name, phone number, and e-mail address at the reference's location.

PART III: TECHNICAL

A-Please answer the following questions yes or no:

1-Integration with Dell's current e-mail solution system is possible (PeopleSoft)

2-Solution deploys open source code

3-Batch processing of data is available

4-Real-time processing of data is available

5-Blend processing (batch + real time) of data is available

6-Interim bug fixes are available between releases

7-Notifications are managed by users through a graphical user interface

8-Notification prioritization is available

9-Custom reports are available

10-Reports are easily imported to a database or Excel spreadsheet

11-Requires IT resources to implement

12-Phone notification plays different messages based on response

13- No limit on number of system administrators

14- Administrator can delegate the control process to other users

B-Open-ended questions:

1-What method or combination of methods does the product use in establishing security?

   Please be specific.

2-Please specify guaranteed technical-support response times.

3-How much training is required?

4-How many simultaneous users are supported?

5-What are your per-month notification volume capabilities? What is the highest number of notifications you have sent per month so far?

6- Which operating system does the platform use? What type of operating system can it support or is compatible with?

7- For phone notifications approximately how many phone lines are needed?

8-Does this product have any known conflicts or incompatibilities with any software or hardware (including firewall products)? If so, please list them.

9-Identify all operating systems for which the database server components, application server components, non-Web clients, and Web clients are available.

10-Whose hardware do you use for your servers?

11-Identify all Application Program Interfaces (APIs) that you provide with the system to support integration with external systems.

12- Describe the process of installing a new release. Please be specific, such as how long it takes and how the system works during upgrading. Differentiate the process between hosting versus non-hosting solutions if the process is different for both.

13-Specify the development languages used to create the solution.

14-Describe the system's encryption methods and/or its ability to interface with encryption software during communication between client stations, application servers, and database servers.

15-Describe the support services not provided with your solution; be specific.

16-Describe the length of a typical warranty and the extent of coverage.

PART IV: TOTAL COST OF OWNERSHIP

1-Specify approximate one-time costs, such as purchase, installation, documentation, cancellation, or any others you may see fit.

2-Specify any recurring costs such as maintenance, cost of back up, and training (one time or recurring).

3-Explain the cost structure for the platform's extensibility and scalability for extra capacity when needed.

4-Specify the approximate upgrade cost

5-Please specify any additional costs.

6-Please supply a separate estimate for a pilot program.

Response Format: (Maximum 10 pages)

Cover page

- Company name

- Date

- Company address, telephone and fax numbers

- Company representative/contact name

Company background

- Description of company's history, specifically on proactive notification solutions

- How long has your company been providing notification solutions?

- Describe the ownership and strategic partnership of your company

- Briefly describe your primary customer base

- Include company's latest financial info (a copy of 10-Q can be attached as appendix) Include information such as current ratio, gross profit margin, days of cash, debt to asset ratio, working capital, current assets, current liabilities, total assets, retained earnings, Earnings Before Income Taxes (EBIT), number of outstanding shares (if applicable), market price-per-share (if applicable), sales and total debt.

- List all other vendors, if any, that will be involved in providing the solution. Please include the company name, contact info and background, including their financials as described above.

- Please include the breakout of relevant staff who will be working on the project—if awarded—which departments, how many people and specialty employees, etc.

- Summarize in a short paragraph why Dell should consider your company for this project

CONTACT INFO:

Omur Kaya

CDN Project Benchmarking Lead

Tel: (512) 723-xxxx

E-mail: omur_kaya@dell.com

A Sample Questionnaire

COMPANY BACKGROUND AND OPERATION:

- Can you give a brief summary on the company's background?

- What is your order volume? What percentage of your business comes from consumers, small/medium businesses, etc.?

- What percentages of the notifications go thorough e-mail, phone, SMS, etc?

- Who performs what tasks related to the outbound notification at your organization?

- Do you have different notification-process methods in place for different customers, such as loyal customers or small business customers versus one-time shoppers?

- Do you use outbound notifications for marketing campaigns?

- Do you measure customer satisfaction with outbound notifications? If so, how?

- What types and number of people are needed to provide ongoing operational and administrative support of the system?

- What customer needs are supplied in notification messages, i.e. what do they want to know?

- What were your project goals? Did you achieve them? What is the success rate and how do you measure it, i.e. what metrics do you use? If not, what is the problem as you see it?

- What are the contributing factors to your success with outbound notification?

- What is your operating cost per year for C3 Solution, what is your cost per notification (e-mail/phone)?

- What were the amount of time and personnel needed for the project?

- Have you done any benchmarking on outbound notification systems? If so, can you elaborate on what you learned?

- Can you talk about the operational process flow from order entry to shipment notification?

- How does the process work if the customer wants to make changes, for example, in the shipping address?

- Do you use a speech-recognition system or any other method for incoming calls resulting from outbound notifications, or do you direct these inquiries to your customer care?

- How often are the notifications sent out? Is any prioritization done?

- Do you send out notifications in real time or batch format?

- How do you develop business rules, such as creating retry logic?

- How automated is the system and the process? Are any manual process needed?

- How customized are your notifications and what variables, such as name and address, do you use?

- How do you verify the customer's identity if he/she calls back in—order number, credit card number, social security number?

- Explain your process for tracking completed notifications?

- Describe your experience with reporting tools? Are you happy with them?

- How do you handle multiple orders from the same customer? Is any consolidation done? Do you send out one notification or multiple notifications for each order, especially when pieces are not going to be shipped together?

ARCHITECTURE/TECHNOLOGY:

- Do you use hosting offered by C3 or do you have everything in-house?

- Which product/version of C3 are you currently using?

- Have you had any problems with the platform? If so, how often?

- What is C3's back-up reliability?

- What is the contingency/back-up plan when the system is down? C3's and yours?

- What is the success rate of the notifications?

- Which operating system do you use?

- Which database do you use?

- What is C3's solution's overall ability to solve unique client problems within base application (flexibility)?

- Do you use third party integrators at all? If so, who and what product?

- Describe how you have used other technologies, such as Extensible Markup Language (XML), Electronic Data Interchange (EDI), batch data import/export, etc., to support integration with external systems.

- Have you had any interface problems with other applications you have in place?

VENDOR EVALUATION/PARTNERSHIP:

- Were you satisfied with C3's overall performance?

- Would you do business with C3 again?

- Can you name another customer of C3 that uses similar technology?

- Do you know any C3 customer that had a bad experience with this vendor's solution?

- What other vendors did you look into before choosing C3?

- Why did you choose C3? What was C3's differentiating factor?

- Is it easy to get help quickly for application-related problems? What is C3's standard response time?

- What are the strengths and weaknesses of C3's solution?

- Was C3 able to scale up or down to react to changes in project landscape?

- Any communication/support issues between C3 and your company?

- How sufficient is C3 training and documentation?

- How do you rate C3 as a strategic partner?

- How was C3 at meeting commitments?

IMPLEMENTATION:

- When was the implementation started?

- When did you go live?

- Any changes in project scope during the implementation process?

- Was C3 able to meet timing targets during the implementation?

- How did your IT department work with C3 to implement the solution? How was the work divided between your IT department and the C3 team?

- What process seemed to be the biggest constraint during implementation/execution and how did you resolve it?

- Explain the level of support provided by C3 after the implementation?

RESULTS:

- What areas did you target to improve before implementation and what were the results?

- What does your ROI look like?

- Did you see any reduction in incoming calls? Reduction in returns?

- Did you incur any costs for customizations?

- What was your FTD percentage before implementing the proactive notification and what is it now?

- What is the customer feedback?

APPENDIX B

VENDOR EVALUATION MATRIX SUMMARY		RAW SCORE			WEIGHTED SCORE		
	Percentage	Company1	Company2	Company3	Company1	Company2	Company3
1- FUNCTIONALITY	25.0%	100	100	96	2.65	2.65	2.41
2-ARCHITECTURE&TOOLS	25.0%	101	92	111	3.88	3.45	4.27
3-REFERENCES	5.0%	9	11	15	3.40	4.20	5.00
4-TOTAL COST OF OWNERSHIP	10.0%	11	10	3	3.55	3.64	1.00
5-FINANCIAL VIABILITY	25.0%	27	29	25	4.09	3.91	3.55
6- RFI RESPONSE & DEMOS	5.0%	26	28	30	4.20	4.60	5.00
7- IMPLEMENTATION	5.0%	9	11	13	3.00	4.80	4.00
Total	100%						
Weighted Based on percentages shown above		60.3	58.8	61.2	3.54	3.50	3.36

BEST CHOICE: Company1

Date: __11/3/2004_____   Prepared By: __Omur S. Kaya_____

Project Name_:CDN_____   Title __MIT-LFM Intern_____

NOTE THAT: 1- BEST CHOICE IS SELECTED BASED ON THE WEIGHTED SCORE
2- YELLOW CELLS ON THIS SHEET CAN BE CHANGED W/O CALCULATION, BUT,
FOR THE YELLOW CELLS IN OTHER SHEETS, PLEASE MAKE THE NECESSARY CHANGES
BASED ON THE METHODOLGY EXPLAINED IN EXECUTIVE SUMMARY.

APPENDIX C

	Percentages	Company1	Company2	Company3	RAW SCORE			WEIGHTED SCORE		
					C1	C2	C3	C1	C2	C3
1- FUNCTIONALITY	25.0%									
E-mail notification is possible (1)	5.88%	y	y	y	5	5	5	0.294	0.294	0.294
Phone notification is possible(1)	5.88%	y	y	y	5	5	5	0.294	0.294	0.294
SMS notification is possible(1)	5.88%	y	y	y	5	5	5	0.294	0.294	0.294
Message to PDA and Cell phone is possible(1)	5.88%	y	y	y	5	5	5	0.294	0.294	0.294
Message to a fax machine is possible(2)	2.94%	y	y	y	5	5	5	0.147	0.147	0.147
Speech recognition system is available(2)	2.94%	y	y	y	5	5	5	0.147	0.147	0.147
Integration with Dell's current e-mail solution system is possible (PeopleSoft)(1)	5.88%	y	y	y	5	5	5	0.059	0.059	0.059
Solution deploys open source code(2)	2.94%	y	y	y	5	5	5	0.029	0.029	0.029
Batch processing of data is available(1)	5.88%	y	y	y	5	5	5	0.059	0.059	0.059
Real time processing of data is available (1)	5.88%	y	y	y	5	5	5	0.059	0.059	0.059
Blend processing (batch + real time) of data is available(1)	5.88%	y	y	y	5	5	5	0.059	0.059	0.059
Notifications managed by users through a GUI(1)	5.88%	y	y	y	5	5	5	0.059	0.059	0.059
Uptime of the platform(1)	5.88%	99.9%	99.9%	99.5%	5	5	3	0.294	0.294	0.176
Platform's error rate(1)	5.88%	0	0	Less than 0.1%	5	5	3	0.294	0.294	0.176
Notification prioritization available(2)	2.94%	y	y	y	5	5	5	0.029	0.029	0.029
Custom reports available(1)	5.88%	y	y	y	5	5	5	0.059	0.059	0.059
Reports are easily imported to a database or Excel spreadsheet(1)	5.88%	y	y	y	5	5	5	0.059	0.059	0.059
Phone notification plays different messages based on response(1)	5.88%	y	y	y	5	5	5	0.059	0.059	0.059
No limit on number of system administrators(2)	2.94%	y	y	y	5	5	5	0.029	0.029	0.029
Administrator can delegate the control process to other users(2)	2.94%	y	y	y	5	5	5	0.029	0.029	0.029
	100.00%				100	100	96	2.647	2.647	2.412

	Percentages	Company1	Company2	Company3	RAW SCORE			WEIGHTED SCORE		
					C1	C2	C3	C1	C2	C3
2-ARCHITECTURE&TOOLS	25.0%									
24/7 technical support is available(1)	4.88%	y	y	y	5	5	5	0.244	0.244	0.244
A pilot is available (2)	2.44%	y	y	y	5	5	5	0.122	0.122	0.122
Non-Hosting is available(1)	4.88%	y	n	y	5	0	5	0.244	0.000	0.244
Turn-key solution is available(1)	4.88%	y	y	y	5	5	5	0.244	0.244	0.244
Interim bug fixes available between releases(1)	4.88%	y	y	y	5	5	5	0.049	0.049	0.049
Scheduled service interruptions (1)	4.88%	5-20 minutes	100 minutes	Less than 15 minutes	5	1	5	0.244	0.059	0.294
Other vendors, if any, that will be involved in providing the solution (2)	2.44%	no	no	no	5	5	5	0.122	0.122	0.122
Unscheduled service interruptions(2)	2.44%	less than an hour	within a few hours	95 minutes	5	1	3	0.122	0.024	0.073
Phone notification capacity(1)	4.88%	27,000 1min calls per hr	127,000 1 min calls per hr	600,000 1 min calls per hr	1	3	5	0.049	0.146	0.244
E-mail notification capacity(1)	4.88%	91,000 email per hour	500,0000 per hr	600,000 per hr	1	5	5	0.049	0.244	0.244
Additional capacity(1)	4.88%	Can triple within 2-3 weeks	increase in 30 days	increase within 4weeks	5	3	3	0.244	0.146	0.146
E-mail size limit (1)	4.88%	SMB limit supports attachments	10kb	suports attachments	5	1	5	0.244	0.049	0.244
Flexibility of capacity usage (1)	4.88%	Not clearly answered, but mentions capacity is not a problem	1m a month commitment--> 100%can be used in a day if it is split between phone and e-mail	10% of monthly capacity can be used in a given day	3	5	5	0.146	0.244	0.244
Last version (2)	2.44%	was released on 7/26/2004.	on October 2004	August 12,2002	5	5	3	0.122	0.122	0.073
Approximately how often major and minor revisions come up?(2)	2.44%	one major and one minor per year.	one major per year, quarterly minor	monthly minor, biannuaul major	1	3	5	0.024	0.073	0.122
Characteristics of your platform you think differentiate your product from the others(1)	4.88%	1-Flexibility in choosing different infrastructures 2-Control: new applications can be developed, if desired 3-Scalability 4-Reliability:capacity allocated to Dell only used by Dell	1-Functionality: full control over delivery options 2-Technology: reliable, secure, scalable self-healing network	1-Easy integration to many legacy systems 2-Good application and reporting layers 3-Strength in voice delivery	5	5	5	0.244	0.244	0.244
Security (1)	4.88%	1-Encrypted transports via HTTPS, secure FTP or VPN 2-Administrative tasks are authenticated via digital certificates or standard challenge/ response techniques	1-Data security: transferred and stored data are encrypted 2-Physical security: 24x7x365 3-Network security: All data centers reside behind the firewall 4-No personal data is ever sold, traded, leased etc.	1-Enterprise level :solution sits behind Dell firewall,encyrpted data sent via SSL,HTTPS or VPN 2- Security: physical, application,network 3-Application administration security 4-Consumer data security 5-Data storage effectiveness	3	5	5	0.146	0.244	0.244

Question	Weight	Vendor 1	Vendor 2	Vendor 3						
Guaranteed technical support response times.(1)	4.88%	Phone: 7am-7pm CT, E-mail: 24x7. Acknowledge of incident within 30 min w/ tacking #. High issues: 2days, Medium: 7 business days, Low: next software release	24x7 phone support. Severity 1:Respond within 30min and reduce the level within 60 min, Severity 2: Respond w/n 60 min of notification during appropriate hours, reduce the severity level within 24 hrs Severity 3&4 : Does not affect the operation seriously	severity 1 & 2: Response within 30-60 minutes, Severity 3: Response within 1-2 hours	3	5	3	0.146	0.244	0.146
highest number of notifications sent per month so far(2)	2.44%	5m notifications	13m multi-model notifications	20m, mostly phone notifications	1	3	5	0.024	0.073	0.122
Which operating system does the platform use? And what type of operating system can it support or compatible with?(2)	2.44%	Windows 2000 Server and Sun Solaris,other unix operating systems supported	Computing platform:Compaq / HP Windows NT and 2000, Database server: Compaq Windows 2000 Advanced Server and SQL 2000 Enterprise Edition	Platform is built with Sun java2 enterprise edition (J2EE)	3	3	5	0.073	0.073	0.122
Any known conflicts or incompatibilities with any software or hardware (including firewall products) (2)	2.44%	no	no	no	5	5	5	0.122	0.122	0.122
Hardware used for your servers(1)	4.88%	Dell servers	Compaq/HP for communication platform and database server	Sun servers for application and database	5	1	1	0.244	0.049	0.049
Identify all application program interfaces (APIs) you provide with the system to support integration with external systems(2)	2.44%	Data can be sent over HTTPS, FTP, SMTP, MQ Series or JMS. Also Web Service and Java API for implementing a message center	Web Services (SOAP) and XML API for integration with external systems	Allows any customer that uses Java programming to establish a connection to Gateway server	5	5	5	0.122	0.122	0.122
Process of installing a new release(1)	4.88%	Minor releases: minimal planning and no down time, Major releases: more planning and minimal down time.	Since it is hosted solution, it is done at C2 on a rolling basis: network is never down. Customers notified 48 hrs in advance	In most cases there is no downtime, Maintenance releases takes less than 15 minutes od scheduled downtime	5	5	5	0.244	0.244	0.244
Support Services not provided with your solution(1)	4.88%	C1 typically provides support for custom code developed for a limited time after implementation, after post-launch support period client typically support the custom components of the solution	Since it is hosted solution ,no additional support services is required. Everything is covered in the agreement	1-Enhancement to the design and or function of the application 2-Design& Implementation of additional applications and custom reports 3-Training beyond the introductory online reports training	5	3	3	0.244	0.146	0.146
	100.00%				101	92	111	3.878	3.449	4.270

			Company1	Company2	Company3	RAW SCORE			WEIGHTED SCORE		
						C1	C2	C3	C1	C2	C3
3-REFERENCES	5.0%										
Ratio of successful contact/attempted contact(2)	20.00%	0.33: Contacted three and was successful w/ only one	0.33: Contacted three and was successful w/ only one	1: Contacted two and was successful on both	1	1	5	0.2	0.2	1
Vendor's Strengths(1)	40.00%	Lean company, reliable,structured and organized,responsive,good at adopting a new solution(flexible), very dynamic business model, technical leadership strong and they share their roadmap, development and support group lined up well, successful in meeting timeline and good support	Very responsive, Good at maintenance, reliable, No technical problems, successful relationship, helpful in solving XML issues,meet the deadlines	Very quick on the fly, good ad scaling up,smooth updates,Very responsive, Good at customization,Cost effective, heavily used by airlines, good partnership relations	5	5	5	2	2	2
Vendor's Weaknesses(1)	40.00%	Resource Constraints, survivability, VPN compatibility problems for a couple of days	It took time to learn UI given by C2	Not very good for creating scripts,small company	3	5	5	1.2	2	2
	100.00%				9	11	15	3.400	4.200	5.000

	Percentages	Company1	Company2	Company3	RAW SCORE			WEIGHTED SCORE		
					C1	C2	C3	C1	C2	C3
4-TOTAL COST OF OWNERSHIP	10.0%									
Average cost per year (based on 2 years), ASP cost (1)	54.55%	$1,359,200	$1,033,800	$2,285,900	3	5	1	1.636	2.7273	0.545
Average cost per year (based on 2 years), Dell hosted cost(2)	27.27%	$1,601,700	Don't have this option	$2,283,500	5	0	1	1.364	0	0.273
Pilot cost (3)	18.18%	$11,221	$0	$20,100	3	5	1	0.545	0.9091	0.182
	100.00%				11	10	3	3.545	3.636	1.000

	Percentages	Company1	Company2	Company3	RAW SCORE			WEIGHTED SCORE		
					C1	C2	C3	C1	C2	C3
5-FINANCIAL VIABILITY	25.0%									
Company's history on Proactive Notification Solutions (2)	9.09%	Established in 1999, 5 years experience	Established in may 1998	Established in 1999, more than 4 years of Notification experience	3	5	3	0.273	0.4545	0.273
Ownership of the company and its structure(2)	9.09%	Owned privately, raised over 30m between 99-03	Owned privately, raised 30m in venture funding	Owned privately,financed by top-tier VCs, total of 32.7m raised	5	5	5	0.455	0.4545	0.455
Customer base(2)	9.09%	13 Fortune 1000 customers	110 customers,82 of them Fortune 1000	70 customers, 52 of them Fortune 1000	1	5	3	0.091	0.4545	0.273
Latest Customer renewal rate(1)	18.18%	100%	99%	97%	5	5	3	0.909	0.9091	0.545
Growth rate(1)	18.18%	100%	75-85%	50%	5	3	1	0.909	0.5455	0.182
Revenue generated per employee per year(1)	18.18%	7-10m sales for 2004, 40 employees--> 0.175-0.25m	~2.8m for the first 2Q, 41 employees--> 0.137m	16m sales expected in 2004, 90 employees--> 0.178m	5	3	5	0.909	0.5455	0.909
Why should Dell consider your company for this project(1)	18.18%	Leader in converged communications	1-Reliability and Security 2-experience 3-Features	Large scale implementation in 2-6 weeks, minimal customer resources, 30% of 20m notifications are delivery status notifications.	3	3	5	0.545	0.5455	0.909
	100.00%				27	29	25	4.091	3.9091	3.545

	Percentages	Company1	Company2	Company3	RAW SCORE			WEIGHTED SCORE		
					C1	C2	C3	C1	C2	C3
6- RFI RESPONSE & DEMOS	**5.0%**									
On time response(1)	20.00%	y	y	y	5	5	5	1	1	1
Response Completeness, further investigation needed? (1)	20.00%	Complete but needed to contact 4 times to clear 17 questions	Complete but needed to contact 3 more times after RFI to clear 18 questions	Complete but needed to contact twice for 12 questions	3	3	5	0.6	0.6	1
Quality and professionalism (1)	20.00%	Pricing model was not clear, Not clearly defined terms, such as Gross Licence fee, Gross software fee. Had to dig these out.	Well organized, detailed RFI	Well organized, professionally prepared, detailed information provided	3	5	5	0.6	1	1
Overall Responsiveness(1)	20.00%	Very good	Very good	Very good	5	5	5	1	1	1
Presentation & Demo effectiveness(2)	10.00%	E-mail and phone msgs shown, they gave online references to look at, good organization of topics	Did not have voice recognition System during the demo, overall effective demo	Had technical problems twice but ended up having the demo in Oregon during a site visit, effective demo	5	5	5	0.5	0.5	0.5
Ability to sufficiently answer questions(2)	10.00%	y	y	y	5	5	5	0.5	0.5	0.5
	100%				26	28	30	4.2	4.6	5

	Percentages	Company1	Company2	Company3	RAW SCORE			WEIGHTED SCORE		
					C1	C2	C3	C1	C2	C3
7- IMPLEMENTATION	**5.0%**									
Roll-out Strategy clearly defined(1)	50.00%	7steps scheduling w/ deliverablesare given	Detailed 4 stages given on RFI, Also a separate sheet for implentation is given	yes, and each weeks detailed plan also shown on RFI	3	5	3	1.5	2.5	1.5
Timeline(2)	25.00%	weeks to 6 months,	26 work days	2-6 weeks	3	3	5	0.75	0.75	1.25
Training(2)	25.00%	If C1 hosted: minimal training, otherwise documentation given and no formal training is done	minimal training since hosted solution	C3 Hosted: No training necessary,DELL hosted: Administrator training course, agent training course	3	3	5	0.75	0.75	1.25
	100.00%				9	11	13	3	4	4

APPENDIX D

TOTAL COST OF OWNERSHIP FOR C1		DELL HOSTED	ASP	
Licensing (One time)		$250,000	$10,000	per month
Installation (One time)		$25,000	-	
Training (One time)		$15,000	$15,000	
Integration (One time)		$100,000	$100,000	
Upgrades		$135,000	-	Notes: upgrades are 30% of gross software cost
Maintenance		$90,000	-	
Gross software cost	$450,000			

Phone Messages	Dial only	Dial+TTS	Dial+TTS+ASR	Notes:
Over 5 million	0.045	0.0525	0.065	1- One phone message is equal to 1 minute call
2m-5m	0.05	0.0575	0.07	2- Size limit for emails is 5mb
1m-2m	0.0575	0.065	0.0775	3- TTS: Text to speech
500,000-1m	0.0675	0.075	0.0875	4- ASR: Automeated speech recognition
0-500,000	0.08	0.0875	0.1	5- Fax cost is per minute usage

E-mail,SMS and IM	Email	SMS	IM	
Over 2m	0.01	0.06	0.015	
1.5 m-2m	0.0115	0.065	0.0175	
1m-1.5m	0.0125	0.07	0.02	
0.5m-1m	0.0145	0.075	0.0225	
0-0.5m	0.017	0.08	0.025	
Fax				
over 1m	0.12			
0.5m-1m	0.13			
0.25m-0.5m	0.14			
0-0.25m	0.15			

	Scenario	Volumes	Voice Choice	
Voice	70%	1050000	3	Enter 1 for dial only; 2 for Dial+TTS;
E-mail	20%	300000		3 for Dial+TTS+ASR
SMS	10%	150000		
Fax	0%	0		
IM	0%	0		Note: Cells in yellow can be modified
Total	100%	1500000		
	Total % is ok			

Notification Cost				
Monthly Volume	1,500,000			
Phone options	60375	68250	81375	

Phone	$81,375	
E-mail	$5,100	
SMS	$12,000	
Fax	$0	
IM	$0	

TOTAL COST PER YEAR	DELL HOSTED	ASP	
			Notes: 1 major upgrade per year is done by C1
Fixed Cost	$390,000	$115,000	
Variable Cost(per year)	$1,406,700	$1,301,700	
1st year cost	$1,796,700	$1,416,700	Note: No volume change from year to year
2nd year cost	$1,406,700	$1,301,700	
AVE. COST over 2years	$1,601,700	$1,359,200	

PILOT

		ASP	
Licensing (One time)		$10,000	per month
Installation (One time)		-	
Training (One time)		$15,000	
Integration (One time)		$100,000	

	Scenario	
Voice	70%	
E-mail	20%	
SMS	10%	
Fax	0%	
IM	0%	
Total	100%	
Monthly Volume	15,000	

Phone	$1,050	Note: 1- These dollar figures are obtained by changing the monthly volume to 20,000
E-mail	$51	in automated calculation above (yellow cells) 2- Dial+TTS+ASR option is used
SMS	$120	
Fax	$0	
IM	$0	
TOTAL	$1,221	
1 month PILOT cost=	$11,221	Note: Training and integration is not included since they will be in the pricing of full implementation

TOTAL COST OF OWNERSHIP FOR C2

	ASP	
Licensing	$25,000	per year
Installation/set up (One time)	$20,000	
Training	-	
Voice recognition :	$30,000	implementation and set up (one time)
Annual licensing fee	$55,000	annual licensing fee
Maintanance	-	
Back up	-	

Vendor2 Annual Volume Discount Fees				
Annual Volume Commitment	Phone-Voice/Fax	E-mail	SMS	Note: 1- Each phone and fax is 30 secs
0	$0.1000	$0.0225	$0.2000	2-A standard e-mail is 10kb
$100,000	$0.0600	$0.0150	$0.0120	
$250,000	$0.0500	$0.0125	$0.1000	
$500,000	$0.0450	$0.0100	$0.0900	
$750,000	$0.0400	$0.0090	$0.0800	
$1,000,000	$0.0375	$0.0080	$0.0750	
$1,250,000	$0.0350	$0.0070	$0.0700	
$1,500,000	$0.0325	$0.0060	$0.0650	
$2,000,000	$0.0300	$0.0050	$0.0600	

Monthly Volume	1,500,000		
	Scenario	# of Notifications	
Voice	70%	1050000	
E-mail	20%	300000	
SMS	10%	150000	
Fax	0%	0	
Total	100%	1500000	
	Total % is ok		

COMMITMENT LEVEL CALCULATIONS

Annual Volume Commitment	Phone-Voice/Fax	E-mail	SMS	TOTAL		
0	$2,520,000	$81,000	$360,000	$2,961,000	n	
$100,000	$1,512,000	$54,000	$21,600	$1,587,600	n	
$250,000	$1,260,000	$45,000	$180,000	$1,485,000	n	
$500,000	$1,134,000	$36,000	$162,000	$1,332,000	n	
$750,000	$1,008,000	$32,400	$144,000	$1,184,400	n	
$1,000,000	$945,000	$28,800	$135,000	$1,108,800	n	COMM. LEVEL
$1,250,000	$882,000	$25,200	$126,000	$1,033,200	y	
$1,500,000	$819,000	$21,600	$117,000	$957,600	y	
$2,000,000	$756,000	$18,000	$108,000	$882,000	y	

Commitment level=	$1,000,000	Enter the number based on COMM LEVEL calculated above
Actual Cost=	$1,108,800	Enter the numbernext to COMM LEVEL on the last column in above table

Note: C2 offers pricing of $1m commitment even if we make
less than $1m commitment for the first 2 years? So,if the commitment level shown above is less than $1m
then use the $1m commitment pricing to find the actual cost. For example, if the notification
volume drops to a million per month then commitment level drops to $750,000 but still $1m pricing can be used for the first 2 years

CREDIT EARNED PER YEAR	ASP	
Difference above $100,000 commitment	$900,000	
Credit=	$180,000	
1ST YEAR COST BEFORE CREDIT	$1,238,800	
1ST YEAR COST AFTER CREDIT	$1,058,800	Note: No volume change from year to year
2ND YEAR COST BEFORE CREDIT	$1,188,800	
2ND YEAR COST AFTER CREDIT	$1,008,800	
AVE. COST OVER 2 YEARS	$1,033,800	

PILOT

	ASP	
Licensing	-	per month
Installation (One time)	$20,000	Will be counted toward actual implementation

Message fees:
50,000 domestic 30 seconds phone/fax notifications, 25,000 10k e-mails,10,000 SMS notifications: NO CHARGE

If higher than above number of notifications --> then charges will be as follows

Message Fees During Pilot		
Phone-Voice/Fax	E-mail	SMS
$0.06	$0.015	$0.12

Note bottomline is that since our pilot volume will fall into mentioned NO CHARGE zone, the pilot will be free of charge

PILOT COST=	$0	Implementation cost will be counted toward the actual roll out cost

TOTAL COST OF OWNERSHIP FOR C3

ACTUAL ROLL OUT

Application development/professional services	$40,000-$150,000
Speech recognition:	$10,000 per year licencing fee and $0.03 per minute usage charge
Dell hosted (Enterprise server hosting fee)	$400 per month
C3 hosted (Enterprise server hosting fee)	$600 per month

COST STRUCTURE

If	400,000 voice	500,000 voice	1,000,000 voice	1,400,000 voice	Notes:
Licensing	0.131	0.136	0.128	0.143	1- Fax cost is per page
Voice	0.045	0.048	0.04	0.045	2- No limit on e-mail size
E-mail, SMS	0.01	0.01	0.01	0.01	*including the attachments*
Fax	0.2	0.2	0.2	0.2	

Monthly notification volume	1,500,000

	Scenario	Volumes	MONTHLY COSTS	
Voice	70%	1050000	$180,600	*Note: 1-Phone cost of $0.1705 is based on a linear*
E-mail	20%	300000	$3,000	*interpolation by using the number in above COST*
SMS	10%	150000	$1,500	*STRUCTURE table. 2- Regardless of the volume e-mail-SMS*
Fax	0%	0	0	*cost is the same 3- Voice cost also assumes that 5% of the*
				customer will call back in
Total	100%	1500000		
	Total % is ok			

	DELL HOSTS	C3 HOSTS	
1ST YEAR COST=	$2,331,000	$2,333,400	*Note:1- No volume change from year to year*
2ND YEAR COST=	$2,236,000	$2,238,400	*2- Installation cost is taken as the average of $40k and $150k*
AVE. COST OVER 2 YEARS	$2,283,500	$2,285,900	

PILOT

Application development/professional services	$10,000-$18,000
Dell hosted (Enterprise server hosting fee)	$400 per month
C3 hosted (Enterprise server hosting fee)	$600 per month

COST STRUCTURE

	20,000 voice	COST	
Licencing	0.2		
Voice	0.07	$5,400	*Note: Cost assumes 20,000 phone,5000 e-mail and*
E-mail, SMS	0.01	$100	*5000 SMS messages*
Fax	0.2		
	TOTAL	$5,500	

PILOT COST=	$20,100

Note: This cost assumes the C3 hosting and also assumes that pilot installation fee is the average of $10k and $18k