# The Dell Operating Model
by
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Submitted to the Sloan School of Management and the Department of Civil and Environmental
Engineering in Partial Fulfillment of the Requirements for the Degrees of

Masters of Business Administration
and
Masters of Science in Civil and Environmental Engineering

In conjunction with the Leaders for Manufacturing Program at the
Massachusetts Institute of Technology, June 2004

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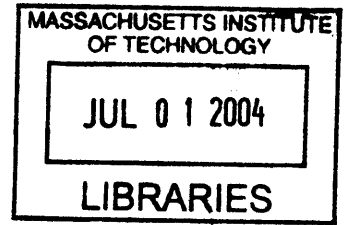
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ABSTRACT

Dell, Inc. is well known for its dramatic and continually improving operational performance in terms of unit cost, inventory level, production capacity, and labor efficiency. However, in late 2002, several members of Dell's Americas operations group realized that they did not fully understand what was driving this operational excellence. Therefore, they decided to sponsor an MIT Leaders for Manufacturing internship project to find out.

The goal of this project was to "identify and document the essential beliefs, principles, and practices that have contributed to the operations success at Dell". The result of this endeavor is a model which describes four beliefs that are widely shared between members of Dell's operations organizations. These four beliefs (or cultural elements) are, in turn, supported by a set of specific management practices and programs.

This model was developed using qualitative organizational research methods including conducting semi-structured interviews, holding focus groups, and gathering individual feedback on a draft version of the model for final validation.

In this thesis, the "Dell Operating Model" is described, and each element of the model is shown to support Dell's critical business objectives. The model is then examined through the lenses of three organizational frameworks, and the limitations of these alternate frameworks are discussed. Finally, the applicability of the model to other companies is discussed, and new projects are proposed that will build on this research.

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Foreword

**"It is interesting to observe that the best compliment that can be made
to an American firm is that it resembles a Japanese company."**

- Arnoldo Hax

These words were written in 1984. Although this statement is less true today for companies as a whole, it is still the dominant feeling in the world of manufacturing. In 2004, American manufacturing organizations still measure their worth by comparing themselves to Toyota.

Until this thesis project, Dell was no exception. Dell's operations groups had struggled for several years trying to figure out how to apply the principles of the Toyota Production System (TPS) and Lean Manufacturing to its production operations. But despite several years of experimentation with these frameworks, they captured the attention of very few employees.

Dell's Operations was struggling with TPS, because it had its own, unarticulated operating model. Because of this embedded philosophy, the TPS and Lean frameworks were viewed with a mixture of curiosity and ambivalence. Dell employees knew TPS and Lean might have some advantages, but the organization's implicit knowledge created resistance to adopting one of these frameworks, especially given the company's successful history of improving productivity and reducing cost.

This thesis project articulates the culture of Dell's operations and identifies the management practices that support that culture. This "Operating Model" is, therefore, quite different from Toyota's model, which is centered around specific tools and production practices. Dell's model paints a picture of how an organization should think and act; whereas Toyota's paints a picture of how a production plant should be run. Dell's model is about the people, and Toyota's model is about process.

Dell's operating model consists of four assumptions about how people should work:

- Being obsessed with producing results,
- Being flexible in the way work is done,
- Leveraging the value of personal relationships, and
- Encouraging leadership at all levels in the organization.

These four principles can be thought of as expressions of American values. As the reader learns more about the model, s/he will hear the chords of leadership, entrepreneurship, hard work, personal accountability, financial discipline, and a reliance on a support structure of friends and co-workers.

Despite their differences, Dell's model is not contradictory to Toyota's. Instead it is another lens through which we may be able to learn some lessons about what makes some production organizations great. It is in this spirit, that the author hopes this thesis is received.

The Dell Operating Model

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1. Introduction

A. Company Overview

Introduction

On February 13, 2004, Dell reported fourth-quarter income of $749 million (a 24% annual increase), on revenue of $11.5 billion. This represents an average 10-year growth rate of revenues and earnings of 28% and 33%, respectively.

This success is not just due to top line growth, but also to dramatic improvements in the efficiency of Dell's operations. Dell generates over $1,000,000 in revenue per employee. It operates on only 4 days worth of inventory. And it has an incredible cash conversion cycle of negative 37 days.

This level of operational performance has attracted the attention of many business people and academics who have sought to understand the "secret sauce" of Dell's operations. As Lawton and Michaels have said, "Companies from around the world have been flocking to Austin, Texas to understand the Dell Production Model, much as firms had flocked to Tokyo [to visit Toyota] and River Rouge [to visit Ford] earlier in the century."[1]

Operations Overview

Dell assembles desktop computers, laptop computers, servers, enterprise storage devices, and workstations. All of these products are assembled to custom specifications after orders have been placed; therefore, Dell holds essentially no finished goods inventory. All of the components that go into these products are purchased from other companies. Even the Dell-labeled chasses, keyboards, and mice are manufactured by other companies on contract. Therefore, Dell is quite different from traditional manufacturers in that it does not own or operate any injection molders, pick-and-place circuit board assemblers, or sheet metal stamping machines.

In addition to its computing products, Dell sells branded computer peripherals and consumer electronics such as monitors, printers, PDAs, MP3 players, and LCD televisions, all of which are made by contract manufacturers.

Dell has three geographic business units-- the "Americas"; Europe-Middle East-Africa (EMEA), and Asia Pacific-Japan (APJ). Each of these business units has its own operations division. The operations group in the Americas is Dell Americas Operations (DAO). The EMEA operations division is the European Manufacturing Facility (EMF). And the APJ region's is the Asia Pacific Customer Center and the China Customer Center (APCC/CCC). As can be seen from these names, Dell's operations organizations are often synonymous with the name of its associated manufacturing facilities. Figure 1 shows the three geographic business regions and Dell's six manufacturing sites.
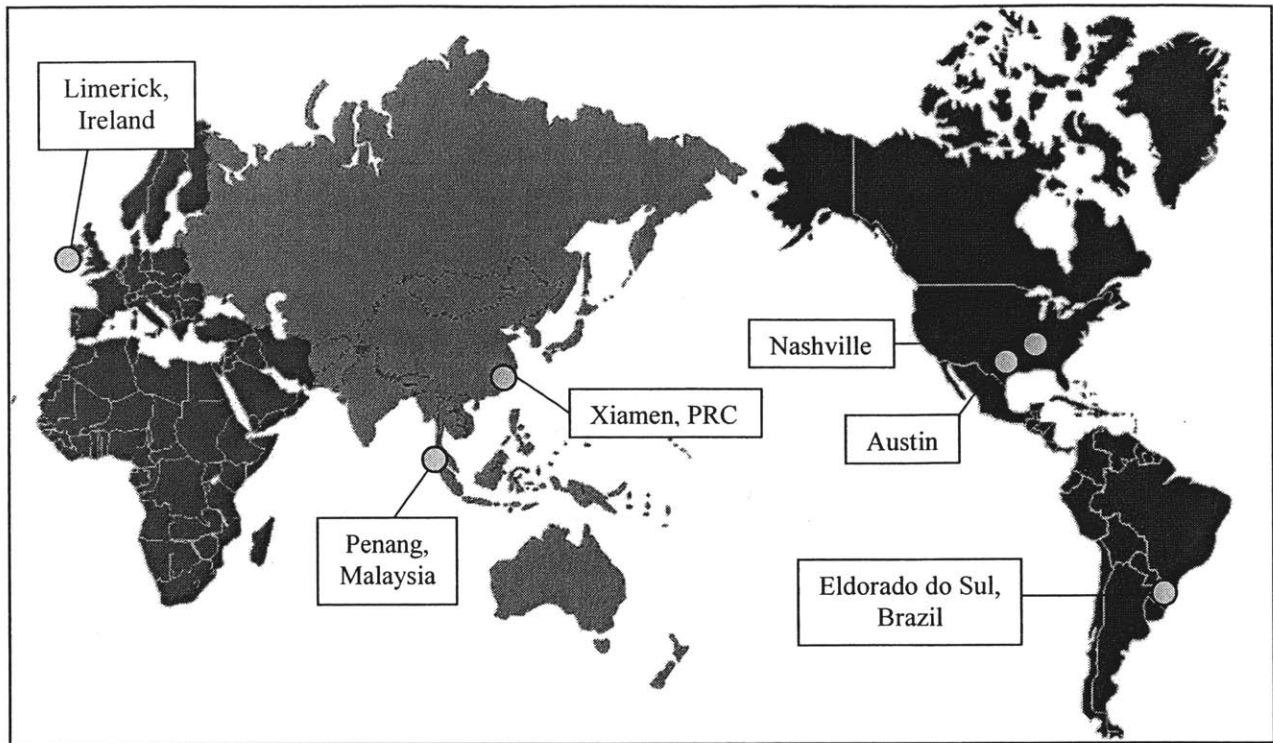
Figure 1. Dell's Six Manufacturing Sites in its Three Geographic Business Units

In fiscal year 2004, Dell reported that 69% of its revenue came from the Americas, 21% from EMEA, and 10% from APJ.

B. What is behind Dell's Operations Success? – A Literature Review

Many articles have been written about the possible reasons behind Dell's operations success. These articles are briefly summarized here. At the end of this thesis, an analysis is presented that shows that some of these perspectives are particularly congruent with the model developed in this thesis.

Background – What Dell Operations Says Makes it Successful

As a backdrop to the survey of the existing literature, it is important to understand what Dell, itself, says is important about its operations. This starts with the business model, which has five main tenets:[2]

- Selling through the "Most Efficient Path to the Customer" (i.e. Selling Directly)

- "Single Point of Accountability" (i.e. Customers should be able to get solutions quickly.)

- "Build-to-Order" Production

- Being the "Low-Cost Leader" in the industry

- Use of "Standards-based Technology"

Within Dell's operations, there is no one coherent message about what makes it successful. Different managers have different slide decks for presentations to external stakeholders, which contain some of the following themes:

- The cost advantages of using a build-to-order production model,

- The efficiency of the "supply chain" including close collaboration with its suppliers,

- The ability to reduce inventory faster than competitors,

- Staying focused on the simple goals of "cost, quality, and delivery", and

- Achieving cost savings through Dell's Business Process Improvement (BPI) program.

Public Literature Review

Many authors have tried to paint a richer picture of what makes Dell's operations tick. Some of these articles focus just on operations and some of them focus on operations and the company, in general, at the same time. Articles were selected for this review if they claimed to explain, in whole or in part, Dell's operations success. The diversity of opinions represented in these articles demonstrates the need for a more holistic view of Dell's operations practices.

Lawton and Michaels[1] contrast companies that pursue vertical integration (owning and operating multiple steps in the value chain) to those that pursue "virtual integration" (owning one step, but coordinating the actions of many steps). They claim that as a company moves from vertical to virtual, traditional organizational structures need to be revised. They note the historical trend away from Henry Ford's completely vertically integrated firm to Toyota's physically close network of suppliers to the modern supply chains where there is "a growing physical separation of activities." Lawton and Michaels go on to describe the relationship between Dell and its suppliers as a "uniquely configured network of alliances and partnerships". Therefore, they argue that Dell has perfected the art of strategic outsourcing, and that this is "the essence of Dell's success."

Jacobs[3] claims that the operations "secret sauce" is "a single minded dedication to supply chain excellence, which means working relationships with its suppliers and vendors that border on the incestuous." He provides a brief but accurate snapshot of some of Dell's supply chain management practices, emphasizing many of the IT software modules that support Dell's day-to-day procurement, logistics, and manufacturing operations.

Curry and Kenney[4] group computer manufacturers by their production/distribution models, and they examine the different specific practices each group uses to deal with the rapidly declining prices of components and finished products. They conclude that "Dell's system [build-to-order production] poses a stunning challenge to the PC industry", because it completely eliminates the problem of eroding component value.

Park and Burrows[5] examine some general management practices at Dell. Specifically, they identify the following five practices as important.

- Expecting a high level of personal accountability

- Minimizing celebration / maintaining sense of urgency

- Management teamwork, especially "two-in-the-box" management

- Tightly managing the balance of revenue and growth

- Being able to kill losing projects quickly

Although the Park and Burrows article is about Dell as a whole, it does highlight some success stories in operations. Additionally, this article came out when the author was working at Dell, and it was generally considered accurate by the operations employees involved in this project.

Eisenhardt and Brown[6] present a compelling idea called "time pacing", which they define as "creating new products or services, launching new businesses, or entering new markets according to the calendar". They claim that time pacing "can counteract the natural tendency for managers to wait too long, move too slowly, and lose momentum." They mention how Dell has coined the term "Dell-ocity" to describe the fast-paced nature of many of its processes. As will be seen later in this thesis, the Eisenhardt and Brown message resonates with the Dell Operating Model when they say that time pacing "creates a relentless sense of urgency around meeting deadlines" while at the same time creating predictability by giving "people a sense of control in otherwise chaotic markets".

The Human Resource Management International Digest published a couple of short articles on the flexibility of Dell's HR practices and culture.[7,8] The first article presents a quick glimpse into the cultural selection criteria for hiring and promoting employees. This article reports that HR seeks managers who can change roles, who thrive in flat organizations, and who understand the Dell philosophy of growing and splitting business units quickly. This article also reports that recruiters often work in regular functional roles during the non-peak periods of the recruiting cycle. The second article presents a short description of the philosophy underlying training programs at Dell. This journal reports that Dell tries to allow learning to occur in the most flexible way possible through the use of web-based content, individually developed training plans, and short-term relationships with training providers.

Clarifying Dell's Relationships with its Suppliers

The author feels compelled to digress momentarily in order to clarify a common misconception about Dell's relationships with its suppliers. Jacobs, Lawton and Michaels, and other authors make a few correct observations about Dell's interactions with it suppliers, but they draw some wrong conclusions. Their correct observations are:

- Dell and its suppliers do share much real-time information,
- Dell and its suppliers are closely linked in other ways, such as close working relationships between individuals to ensure continuity of supply,
- Dell purchases most of its materials from a small number of suppliers.[3] And those suppliers have remained somewhat consistent over the years.

However, this does not mean that Dell "partners" with any company or has commitments beyond its current supply contracts. (Exceptions to this rule are Dell's tacit relationships with Intel and Microsoft.) In fact, Dell awards most supply contracts on the basis of price,

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quality, and ability to ensure a continuity of supply. The fact that Dell has had stable supplier relationships for years is a testament to the aggressiveness of its main suppliers, not long-term commitments between the companies.

This distinction is important because many people think Dell and Toyota's supplier relationships are similar in nature. The reality is, however, that Toyota's integrated products require supplier relationships that share the risks and rewards of new development efforts. However, Dell's modular product architecture means that it can treat its suppliers somewhat interchangeably as well.

C. What are Operating Models?

Operating Models Overview

The concept of an "operating model" or "operating system" is still emerging and being refined. In fact, there are only a few articles that discuss operating models, even though they are starting to become a common framework at many manufacturing companies. Flinchbaugh and Patterson[9] define operating systems as frameworks that describe how companies operate and improve their processes. They say that an operating system should include the following four elements:

- Principles (alignment in thinking to build culture)
- Systems (vital work processes, the way work gets done)
- Tools (to generate new approaches)
- Evaluation (understanding where you are and where you are going)

Vasilash[10] describes operating systems in the automotive industry. He calls operating systems a methodical, codified approach to "getting things done."

The author's own view of operating models is closely in line with Flinchbaugh's; however, it also includes models that are more culture-centric. This author thinks of operating systems as anything that is a "concise articulation of what makes a company unique and successful." Therefore, this author sees cultural models such as Hewlett-Packard's "The HP Way" or Disney's "Dare, Believe, Dream, Do" program as operating systems along with more technical and specific models such as the Toyota Production System.

Although Toyota's and HP's "models" may seem– on the face– to be different, they actually serve the same purposes. First, they align internal employees (create a common language and belief system) which makes doing day-to-day work easier. Second, these "models" are useful for communicating to external stakeholders the reasons for the organizations' success. This external communication helps polish the brand image, because an organization that seems more aware of the reasons for its success should be perceived as being better able to manage for success in the future.

What is the Toyota Production System?

Every student of operations has learned about the Toyota Production System. It has been the subject of numerous academic articles, and it has been touted in the public press as the reason why Toyota has been so successful. The two main interpretations of the Toyota Production System are the "traditional" interpretation and the "DNA" interpretation.

The traditional TPS was first developed and articulated by Taichi Ohno[11] and then later refined and distilled into a graphic and set of ideas called the "House of Toyota". In this graphic, there is a base or foundation of Standardized Work with two pillars representing the principles of just-in-time production (JIT) and Jidoka (error-proofing). These pillars support a roof of "highest quality, lowest cost, and shortest lead time". Figure 2 shows one version of the House of Toyota.
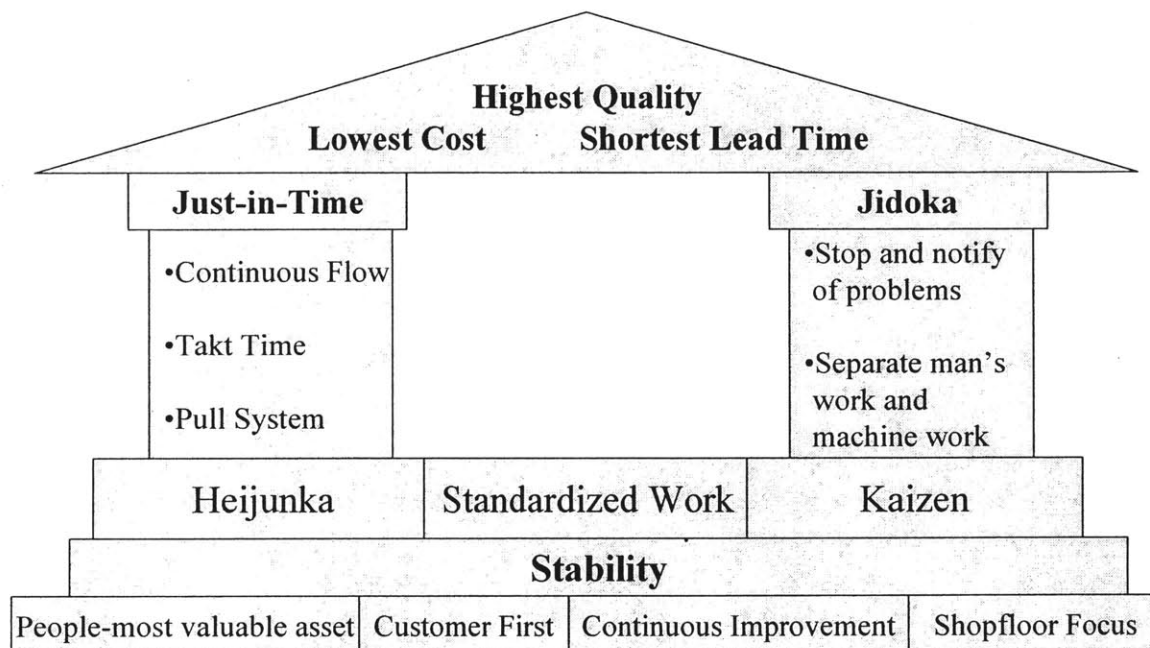
Figure 2. The "House of Toyota" Graphic

The "DNA" version was first articulated in a Harvard Business Review article by Steven Spear and Kent Bowen.[12] This interpretation was born from a two-year ethnographic study of how employees at Toyota actually work. The authors articulate four rules that implicitly guide the work of Toyota employees:

1. All work shall be highly specified as to content, sequence, timing, and outcome.

2. Every customer-supplier connection must be direct, and there must be an unambiguous yes-or-no way to send requests and receive responses.

3. The pathway for every product and service must be simple and direct.

4. Any improvement must be made in accordance with the Scientific Method, under the guidance of a teacher, at the lowest possible level in the organization.

The DNA version of TPS is gaining adherents rapidly, both inside and outside of Toyota. Upper managers in Toyota have great respect for Spear and Bowen, and they often use the phrase "the DNA of Toyota" when they refer to how Toyota works.[13]

D. History of Operating Models at Dell

Overview of Operating Models at Dell

For many years, Dell's operations groups have sought to create a model that would concisely articulate the reasons for Dell's operations success. Of course, this organizational need was not expressed in the same way by all people. Some senior managers stated that there was a need for a model in order to communicate consistently with external stakeholders. Some other Dell employees (mostly those with manufacturing backgrounds) were enamored with the Toyota Production System or Lean Manufacturing and sought to create something similar for Dell.

However, this author discovered that most employees in Dell's operations were not completely comfortable with adopting a version of Lean or TPS as Dell's "model" of what makes it successful. First, they felt that Toyota and Dell were very different companies in terms of the nature of products (modular versus integrated), the relationships with suppliers, and the life cycle of the products and processes. In addition, many people in Dell had a gut-level feeling that Dell worked very differently from other companies. Former senior managers and executives from Motorola, Ford, IBM, Silicon Graphics, and other companies said that they had never experienced a working environment that was as fast-paced and "driven" as their life was at Dell. When these people read the Toyota Production System—with all of its specific rules and practices and methodologies—they said, "This doesn't sound like us."

In order to better frame this project, it is necessary to have a richer understanding of the history of operating models at Dell. There are three distinct efforts that have occurred in this area. The first is Dell America's Operations' (DAO) consideration of the Toyota Production System. The second is the European Manufacturing Facility's (EMF) consideration of Lean Manufacturing. And the third is the ideas promoted by Dell's worldwide operations group, which existed in the late 1990s and early 2000s.

History of the Toyota Production System in Dell Americas Operations[14]

For at least 5 years, DAO has been struggling with the question of how it might adopt the tools, concepts, and beliefs that make up the Toyota Production System. In 1998, the VP of operations realized he needed to bring in some expertise in Lean/TPS principles. It was in that year that he hired three managers, in part, because of their expertise or training in this area. (One of these managers eventually became the director of Dell's Six Sigma program.) In 1998 and 1999 there was a lot of informal discussion about TPS and Lean principles, but these discussions died down after a major reorganization in 2000.

In 2001, an informal team of five managers coalesced and they started educating the leaders of DAO about TPS principles. This group brought in HBS Professor Kent Bowen and the TPS

sensei Hajime Ohba to speak to the VP of operations and his staff. Then in December of 2001, a group of executives from DAO went on a "field trip" to Toyota's Georgetown, Kentucky plant.

All of this interest in TPS culminated in the decision to design and install two TPS-inspired server lines at the Austin manufacturing campus. During the excitement of the construction of these production lines, some employees suggested that DAO should start training its people in the principles of TPS. This idea met resistance, however, by some who thought that it would be risky for DAO to adopt a different "operating philosophy" when Dell's operations were already very successful. Furthermore, there was speculation that Dell might already have its own operating philosophy, even if that philosophy had not been clearly articulated. At an off-site meeting on this subject in November of 2002, a Dell director coined the term "Dell Fast, Flexible Fulfillment" ("DF-cubed") as a possible name for the Dell Operating Model.[15]

History of Lean in the European Manufacturing Facility[16]

Lean started at EMF when a new Vice President of Operations came on board in 1999. The VP asked his direct reports to participate in a Monday morning reading group, where the book *Lean Thinking*[17] was discussed. EMF managers also hired Dan Jones, one of the authors of *Lean Thinking*, as a consultant. Later, in May 2001 a group of six employees was selected to attend Lean courses at the University of Cardiff. This was followed up with a five day course delivered by the University of Cardiff, which was conducted in EMF in July 2001.

EMF leaders also decided to benchmark other companies that practiced Lean Manufacturing, so in 2001, five EMF senior managers visited Unipart, Kodak, and Nokia to learn more about Lean practices at these companies. In early 2002 EMF engaged the consulting arm of Unipart to help it further improve its Kaizen process and its Lean training, in general. In August and September, 2002 two EMF employees participated in Kaizen training and a Kaizen event at Kodak, which was led by Shingijutsu, a leading Japanese-based lean consultant. By 2003, EMF had heard about the success that DAO had with Yomo Consulting, so it also engaged this company to help it advance to the "next level".

From all of these experiences, EMF decided that it would use Kaizen events as the way to implement Lean training and practice. These Kaizen events were done within the framework of Dell's Business Process Improvement (BPI) program, so these two programs became closely linked.

EMF did its first Kaizen in March of 2001, and since then there have been several more Kaizen events to reduce cycle time variance, reduce inventory in the staging area, increase staffing flexibility in the kitting of notebooks and desktops, standardize work in the build process, and relieve bottlenecks in the backend of the desktop line, among others.

Other "Operating Models" at Dell

Lean and TPS are the most important operating models that Dell has experimented with. However, there are two more frameworks that are worth mentioning. In the late 1990's, Dell had a central manufacturing organization located in Austin called World-wide Operations. During

this period, Dell started borrowing and promoting Intel's famous concept of "Copy Exact". The implication of this phrase was that it would take away independence and autonomy from the different geographic operations groups, and for this reason, the idea was not well received. As an operations director in EMF put it, "The whole idea of 'Copy Exact' did not sit well... it just seemed to be all going against the grain."

"Continuous Flow Manufacturing" (CFM) is the other framework used by World-wide Operations that is worth mentioning. CFM is an amalgamation of Lean, Six Sigma, the Theory of Constraints, and other process improvement tools and philosophies.[18] CFM was instrumental during the design of Austin's newest manufacturing sites, and the production lines there are still referred to as "CFM lines". Apart from the production lines, however, few employees talk about the CFM framework anymore.

E. Summary

Many people, both internal and external to Dell, have tried to explain what has made Dell's Operations successful. Internally, Dell's operations personnel have tried to fit their reality to the paradigms of Lean, TPS, "Copy Exactly", and other process improvement frameworks, all with limited success. Dell has used parts of all of these frameworks, but unlike many other organizations, it has never incorporated them as part of its common language or made them part of its organizational identity.

Externally, academics and journalists have also struggled to explain the reasons for Dell's operations success. These writers remind this author of the story of the blind men and the elephant.[19] (One man feels the tail, and says, "It's like a rope." Another man feels the leg, and says, "It's like a tree." The third man feels the trunk and says, "It's like a snake.") Each of the authors is partly correct, but their individual perspectives have offered little meaning to outsiders wishing to learn more about how Dell's operations really works. Therefore, the aim of this thesis project is to describe the elephant as a whole, in a way that all those who have touched the pieces would agree is accurate.

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2. The Research Methodology

A. Brief Overview of the Project Methodology

The stated goal of the project was to *"identify and document the essential beliefs, principles, and practices that have contributed to the operations success at Dell"*.[20] To achieve this goal, information was gathered through a series of semi-structured interviews, and then several "ideas" were generated from the interview data. These ideas were then critiqued and refined in focus groups. And finally, a model was created and sent to about 40 operations employees for a final round of feedback. A graphical representation of this project methodology is shown in Figure 3. This graphic shows the five main project phases as segments in the center arrow. Smaller, u-shaped arrows coming off the center arrow represent when and how the author pulled information from both MIT and Dell.
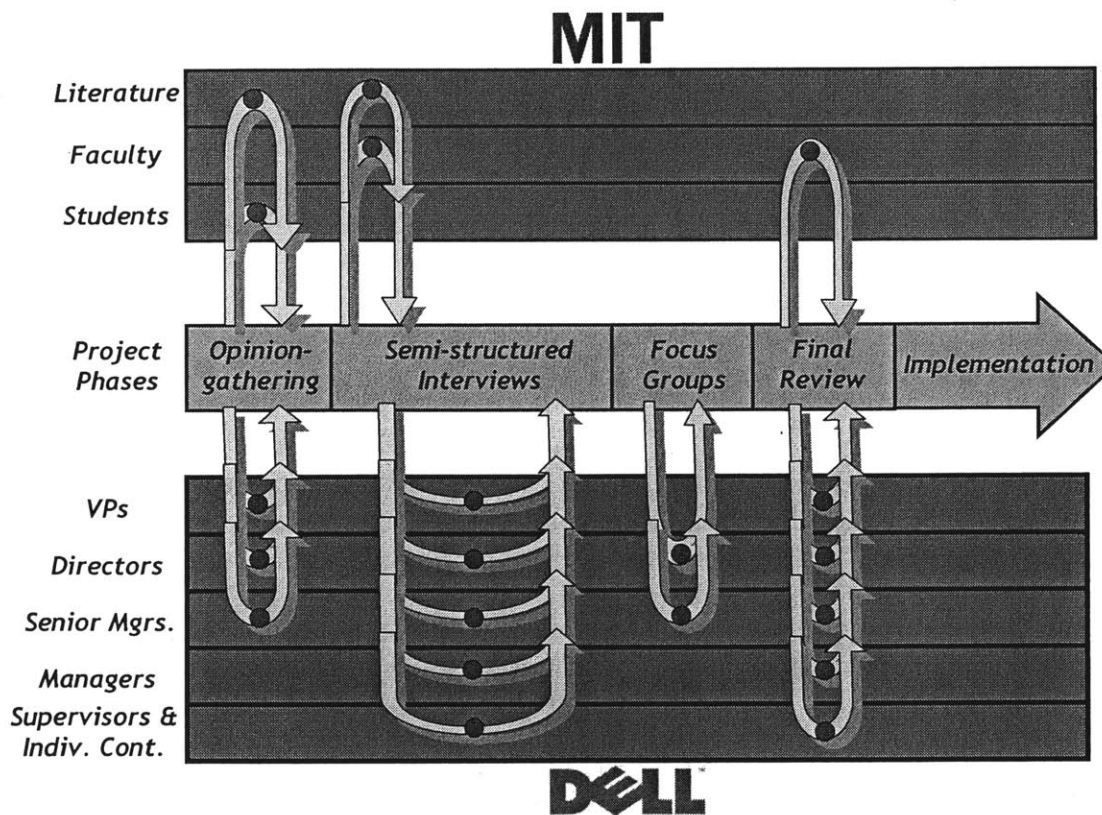
Figure 3. Graphical Representation of Project Methodology

Author's Note: It is important for the reader to understand that this project was performed <u>for</u> Dell, and the author worked in a role much like that of a hired contractor. The desired product was a model that Dell could use for internal training, communication, and motivational purposes; therefore, this project was designed to identify the positive aspects of Dell's operations. Within this context, however, the author always sought to portray reality at Dell accurately, he was given broad latitude in the project methodology, and the company never restricted access to any information that the author sought or attempted to "filter" the results of the project in any way.

B. Opinion Gathering

All research projects begin with a period of uncertainty, where the investigator tries to make sense of the situation he or she is facing. This period of "sensemaking" is rarely discussed, even though it has a huge impact on the chosen research methodology. This is especially true of projects, like this one, which are not hypothesis driven. Therefore, this section explains how the project methodology was chosen.

This project started with an ambitious goal, but no firm methodology. As John Van Maanen states, "Qualitative research [of organizations] is most often designed as it is being done" which allows for "highly contextualized individual judgements".[21] This study was no exception to that generalization. The methodology was developed in response to theoretical as well as practical concerns, and much of the methodology emerged as the project progressed.

The first few weeks of the project were spent collecting opinions from many of the project stakeholders within Dell's operations. During these meetings, these employees were informally asked what they believed to be some of the fundamental reasons for Dell's operations success. In total, about a dozen stakeholders were asked this question. The responses, in most cases, varied widely, with some managers believing that specific practices and functions (like Supply Chain Management) were most important and others stating that management practices (like focusing on metrics) were most important. Still others provided answers like "having the best people" or that the organization was great at "dealing with ambiguity". This wide variation in views led to the conclusion that a large number of people would need to be contacted in order to detect the general patterns in the way people thought and acted at Dell.

Another important, practical consideration was that some people in the organization felt that the effort was a waste of time and/or that it was "directionless". (The project had been going on for some time before the author arrived.) Therefore, the author decided that the research process should become more visible and understandable to members of the organization.

Based on these two conclusions, an interview-based methodology seemed appropriate. It is worth noting that an implicit assumption was made at this time-- that the organization would know and be able to articulate what was making it successful. The risk with this assumption, of course, is that the organization might identify principles and practices that were dominant characteristics, but that had little relation to (or might even be counter to) the organization's success. However, this assumption was to some degree necessary, because more "objective" research methodologies (such as an ethnographic analysis akin to Spear and Bowen's[12]) would have taken much more time. The countermeasure to the risks inherent in this methodology is that the author and his team of advisors applied their judgment if an identified practice or belief appeared to be contradictory to the company's business objectives or strategy. (Section 4 is where some of the identified practices are critiqued.)

C. Interviews

Defining the Interview Questions

The interview questions were designed to capture any and all information that might be relevant—to "cast a wide net" as they say. The primary guide for developing this part of the study was a book about interviewing by Kvale.[22]

The first step in the project was to define the central questions of the research project. Central research questions can either by scientific hypotheses or open-ended questions. For example, a hypothesis could be "Teachers treat learning disabled students differently than regular students." Whereas, a general question could be, "What are teachers' prevailing attitudes about learning disabled students in their classrooms?" This project was not hypothesis based, so the research questions were of the more general, open-ended type. Specifically, the following two central research questions were defined:

- What have Dell's operations groups been doing that has made them so successful?

- What are employees' aspirations of what Dell operations could be like in the future?

The first question was designed to be as broadly worded as possible, because at the outset of the project, it was not known what dimensions of the organization's practices would be most important. Therefore, the research question was chosen so as to avoid biasing the actual interview questions.

The second question came from a practical requirement of the project. The project sponsor—the Vice President of Dell Americas Operations—required that the model be part descriptive and part proscriptive. In other words, he wanted to not only describe the current reasons for the operations success, but he also wanted to point the organization in the right direction for the future.

The actual interview questions were developed initially by the author, and then refined with the help of two Dell employees who participated in mock interviews before the actual interviews began. The final questions that emerged were grouped into the following four categories—three related to central research question #1 and one related to central research question #2:

Central Question 1: What have Dell's operations groups been doing that have made them so successful?

- Very general and open-ended questions

- Questions about basic management practices (HR policies, use of financial information, decision-making practices, etc.)

- Questions about specific practices related to improvements in the day-to-day operations.

Central Research Question 2: What are employees' aspirations of what Dell operations could be like in the future?

- Questions about the future of the operations.

In total, twenty-two actual research questions were defined and used in this study. These questions are presented in Appendix 1.

Selecting the Interviewees

The interviewees were selected by asking vice presidents and directors to recommend individuals in their organizations that had three qualities:

1. They were opinion leaders among their peers.

2. They were "independent thinkers".

3. They had worked at other companies prior to joining Dell.

These people were then contacted and asked to name other individuals with similar qualities lower in their organizations. This process was repeated until there was a reasonably even distribution of people at different levels in the organization and in different functions. Figure 4 shows the distribution of interviewees along these two dimensions. In this figure, each number represents a potential interviewee, and the number is circled if the interview was completed.
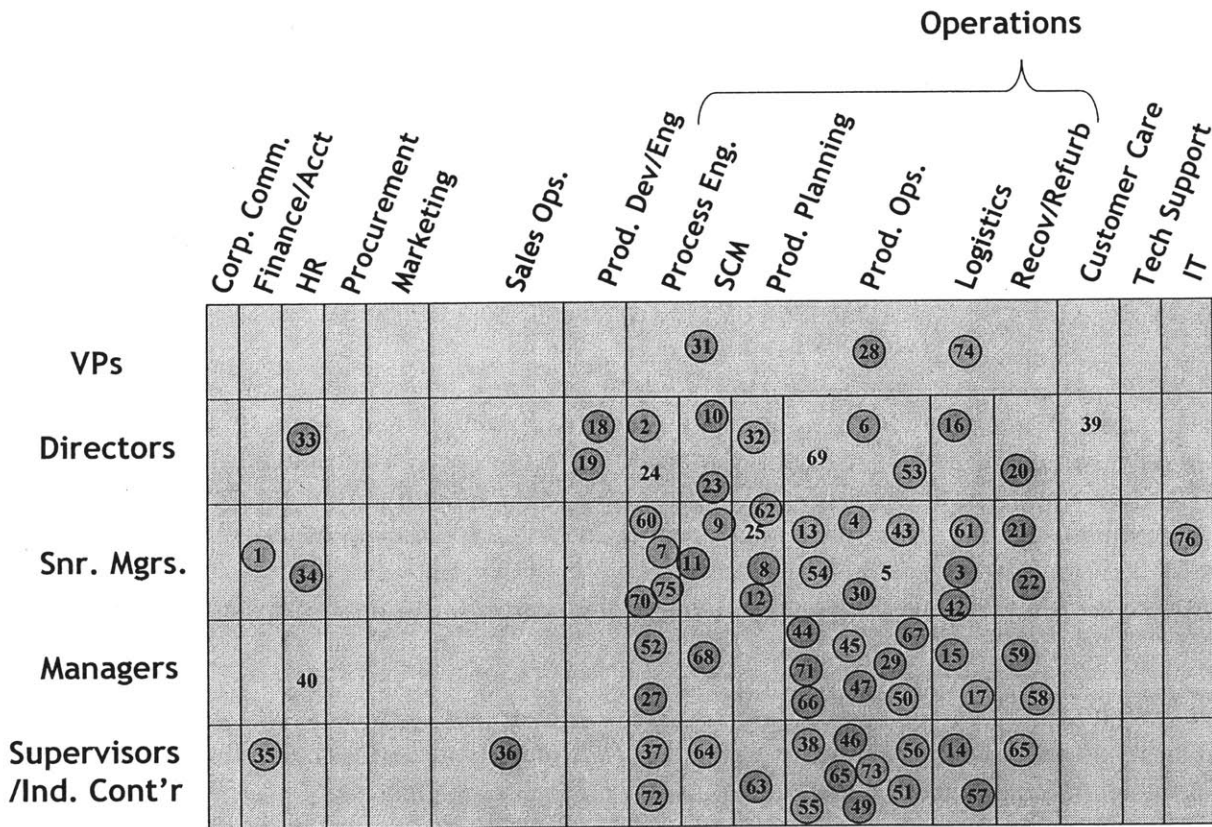

Figure 4. Distribution of Interviewees by Function and Level in the Organization

Interviewee Statistics

Below are some statistics about the characteristics of the interviewees:

Characteristic	Mean	Standard Dev.
Job Level at Dell*	2.4	1.3
Tenure at Dell (years)	4.8	2.0
Work Experience Prior to Dell (years)	11.0	8.5
Number of Companies Worked for Prior to Joining Dell	1.8	0.8
Number of Prior Functions Worked in at Dell	0.8	0.9

* 1= Individual Contributor, 2= Supervisor (1st level Manager), 3= 2nd Level Manager, etc.

Conducting the Interviews

A one-hour meeting was set up with each of the interviewees. The day before the interview, the interviewer stopped by the interviewee's cubicle to introduce himself and give the interviewee a one-page memo that summarized the interview questions. If the interviewee was not at his/her work space, the interviewer left the memo with a brief, handwritten note on it. This practice allowed the interviewee to come to the interview more prepared, and it increased the likelihood that the interviewee would not cancel the meeting or arrive late.

At the beginning of the interview meeting, the interviewer would engage in small talk to start building a level of trust and familiarity with the interviewee. Also, before the interview began, the interviewer obtained the consent of the interviewee to be recorded and informed the interviewee that he/she could stop the interview at any time. (All interviewees consented to being recorded.)

All of the interviews were semi-structured, meaning that the interviewer had the flexibility to:

- Ask follow-up questions to gain a clearer response to an interview question,

- Investigate new, interesting topics that emerged during the course of the interview, and

- Skip some questions if they seemed less relevant or if time ran short.

For this reason, not all of the interviewees were asked all of the questions. Of a total of 66 interviews, 986 total comments were recorded. Therefore, each interviewee was asked approximately 15 of the 22 questions.

Recording the Interview Data

Each of the interview recordings was transcribed into a database. (See Appendix 2 for the structure of the database.) This database structure was defined to allow a user to query the

database to retrieve comments based on interviewee characteristics, such as level in the organization, functional role, tenure, or amount of prior work experience.

During the transcription process, the transcriber sought to condense the interviewees' responses without losing the essential meaning contained in the response. The following guiding principles were used in this process:

- Each response, no matter how long, was usually distilled into one to five sentences.
- Every effort was made to preserve the original language of the interviewee.
- If an interviewee misunderstood or did not answer the question, the transcriber could either ignore the question or place the response in the database as if it were a response to a different, more appropriate question.

D. Idea Generation

From the interview data, several different "ideas" were generated. These ideas were concise articulations of principles, practices, or beliefs that might be reasons for the operations success. These ideas were generated by two means, a formal idea-generation process and a "serendipitous" process. Although the formal process was intended to be the main source of ideas, most of the good ideas actually came from the serendipitous process. Therefore both the formal and informal processes deserve explanation.

The "serendipitous" process happened while transcribing the interviews. Often during the course of the transcription, an idea would occur to the author based on the interview he was listening to. In order not to lose the idea, the author started keeping a separate Word document containing these ideas. Sometimes these ideas would come verbatim from the interviews, but more often the idea was an articulation of an emerging pattern the author detected in the responses.

The formal idea-generation process was done by the author and his supervisor in two sessions. Before the sessions started, the responses to different questions were placed into different natural categories. From this data, the following techniques were used to generate ideas:

- **Articulation of common responses** – The responses to some of the more general and open-ended questions were closely analyzed, and the team sought to concisely articulate some of the most popular responses in unique or compelling ways. Therefore, these articulations were usually closely tied to a specific question.

- **Inductive reasoning** – The team looked for relationships between the most popular categories across different questions. In this practice, typical brainstorming techniques were used to maximize the quantity and creativity of possible ideas.

- **Identifying "gems"** – Sometimes and interviewee would state something that intuitively "sounded right", taking into account the other interview responses. Therefore, sometimes these "gems" would become a major part of an idea.

These two processes produced many different ideas, and the eight ideas that were considered "best" were chosen for the first focus group. These "best" ideas were those that seemed to the

author and his supervisor to be accurate (i.e. supported by interview data) and compelling (i.e. they had the potential to be shaped into positive, compelling messages for the organization).

E. Focus Groups

Three, six-person focus groups were held to critique the ideas. In each session, seven or eight ideas were reviewed, and each idea was discussed for between 5 and 10 minutes. All of the focus groups were recorded on a digital voice recorder, and members of the group gave their consent to be recorded before the session started.

Before the review process, the group was told that they could evaluate the ideas on any basis, but that they might want to keep in mind three particular evaluative criteria. These evaluative criteria were written on a large sheet of paper that was taped to a wall in the front of the room. (An image of this sheet of paper from one of the working sessions is shown in Appendix 4.) These three evaluative criteria were:

- **Is it accurate?** (Does the idea describe reality?)

- **Is it compelling/aspirational?** (i.e. Does the idea "grab you" and make you feel good about what Dell is doing in its operations?)

- **Is it useful?** (i.e. Do you think the idea will guide the right actions or help people make the right decisions in the future?)"[23]

At the end of each session, all of the ideas were taped to the wall, and a multi-vote technique was used to rank the ideas. Each participant was given a number of colored stickers equal to the number of total ideas reviewed in that session. They were told that they could put any number of stickers on any idea, but that they had to use all of their stickers.

After each session, the ideas that scored no or very few points were tossed out, and new ideas were substituted in the next session. These new ideas were either ones that had been generated previously or they were new ones that were generated based on feedback from the previous session. Table 1 shows a summary of the ideas, and how many points each of them scored in the three sessions. The highlighted ideas are ones which had the highest average percentage of votes. Images of each of these ideas from each focus group are presented in Appendix 4.

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Idea #	Idea Title	Meeting #1		Meeting #2		Meeting #3		Mean Percentage
		# of Votes	% of Votes	# of Votes	% of Votes	# of Votes	% of Votes	
1	Dell's Operations Improve Rapidly Because of Closed-loop Feedback	0	0%					0%
2	Dell's Operations Managers "Dive into the Details"	0	0%					0%
3	Management by "Goals from Above" and "Support from Below"	1	2%					2%
4	Dell's Operations Groups Succeed Because They Are an "Elite Winning Team"	4	8%	3	6%			7%
5	Simple Metrics Support Flexibility	9	17%	11	23%	5	14%	18%
6	Dell's Production Lines are Kept Running Because They Have a "Web of Support"	12	23%	4	8%	4	11%	14%
7	Dell Improves Because Employees are "Constructively Dissatisfied"	13	25%	3	6%			15%
8	Dell's Processes and Systems Work Because of a Balanced Approach...	14	26%	9	19%	0	0%	15%
9	Only Time for the Exceptions			0	0%			0%
10	Points of Stability Enable Flexibility			7	15%	7	20%	17%
11	The Pulse of Dell's Operations			11	23%	6	17%	20%
12	Nature of Leadership					6	17%	17%
13	Changing the Nature of Change					7	20%	20%
Total		53		48		35		

Table 1. Summary of Voting Results from the Three Focus Groups

F. Refining the Model

The interview data and focus group feedback was used to construct a draft model. This draft model was written up in a Word document, along with a power-point graphic, and it was sent out to forty people involved in the project. (Thirty-two of these were interviewees.) Twenty-two of the forty people responded with comments. Each of these comments was given a description of Positive, Negative, or Neutral. Of these comments, fifteen were positive, five were neutral, one was negative, and one was unclassifiable. (Note: Comments were rated neutral if they either (1) give a balance of positive and negative comments or (2) if they offered mild suggestions for improvement, without indicating how they felt about the document overall.)

Appendix 5 contains a sample of the comments from the people who reviewed the model. Based on these comments, a few changes were made to the model, which are not detailed here.

3. Results

A. Overview of Results

The author went into the project thinking that a likely outcome would be a "technical" model—in other words, an articulation of specific practices and tools related to the day-to-day operations, somewhat like the Toyota Production System. (As most readers of this thesis know, the Toyota Production System emphasizes the use of specific tools and principles, such as the use of Kanban cards, level loading a plant, error-proofing techniques, and 5S.) Instead, Dell's operations employees said that the most important determinants of success were certain management practices and widely-shared, "cultural" assumptions about how employees should act. As one senior manager responded when the author asked him a question about specific practices related to increasing productivity, "We look for step changes in productivity instead of incremental growth. This is about culture, not specific practices." Many other interviewees made similar statements, either explicitly or implicitly.

The model consists of four "shared beliefs" that exist in Dell's operations, and several specific practices that are aligned with these beliefs. Figure 5 shows a Power-point graphic that was used to communicate these four cultural elements.
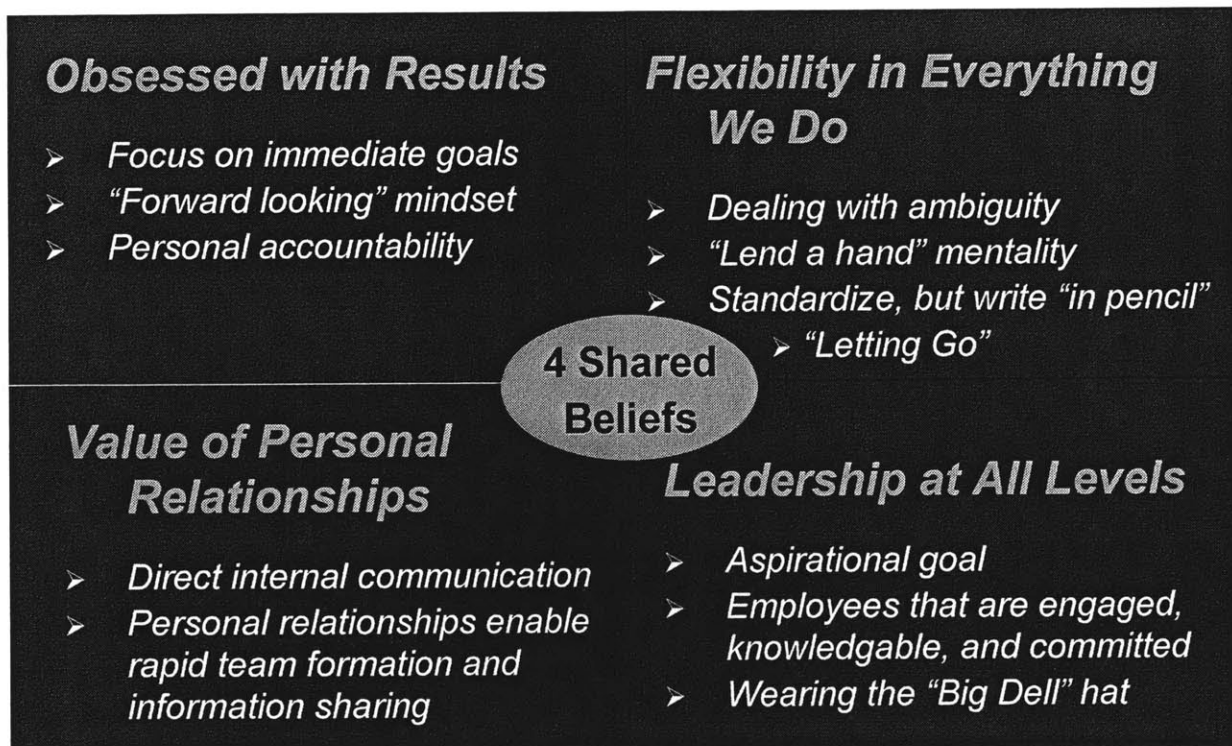

Obsessed with Results
- Focus on immediate goals
- "Forward looking" mindset
- Personal accountability

Flexibility in Everything We Do
- Dealing with ambiguity
- "Lend a hand" mentality
- Standardize, but write "in pencil"
- "Letting Go"

4 Shared Beliefs

Value of Personal Relationships
- Direct internal communication
- Personal relationships enable rapid team formation and information sharing

Leadership at All Levels
- Aspirational goal
- Employees that are engaged, knowledgable, and committed
- Wearing the "Big Dell" hat

Figure 5. Power-point graphic used to communicate the 4 "shared beliefs" in Dell's Operations

Each of these elements is briefly discussed below.

- **Obsessed with Results** – Dell's operations employees reported that most of their time is spent working on efforts that will produce immediate results. One director accurately

summed it up when he said that about 80% of employees work on a time horizon of 1-2 weeks, and the maximum time horizon for most employees is 12 weeks. (See Appendix 4, Focus Group 3, Idea 12.) Employees also reported that they have a "forward-looking" mindset, meaning that they deal with the reality of the present instead of dwelling on what or who caused problems in the past. Finally, Dell employees reported that a high level of personal accountability is part of what creates a culture that is obsessed with results. One supervisor described being obsessed with results well when he stated that you will not do well in Dell's Operations if you are a "We'll get it next time" type of person.

- **Flexibility in Everything We Do** – Dell's Build-to-Order model requires that people, processes, and systems all be extremely flexible and responsive to changes in the market. Therefore, many aspects of Dell's Operations are always in a state of flux. These include the physical production systems, supporting processes, individuals' job or project assignments, and even the organizational structure.

  This acceptance of working flexibly means that employees do not become too attached to the projects on which they are working or the functional organizations they report up through. Some specific manifestations of working flexibly are:

  - Employees report that Dell's operations can "react" to problems extremely quickly by pulling together teams of the right people.

  - Dell's operations organizational structures change often, without much political fanfare. (For example, DAO's organizational structure in Nashville is reported to have changed seven times in four years.)

  - Many employees have commented on the fact that Dell can kill a losing project very rapidly, which implies that the person(s) driving those projects don't become overly attached to them.

  - One employee summed up the balance between flexibility and process rigor when he said that Dell's operations has standards but that they are "written in pencil", meaning that everyone knows that current standards might change tomorrow.[24]

- **Value of Personal Relationships** – Social networks seem to be the foundation for the speed, flexibility, and responsiveness of Dell's operations. For example, production employees often report that they do not follow proscribed escalation processes, but instead use the more efficient informal networks. As one production supervisor said, "Often, we don't have to call maintenance. ... An associate just knows who to contact."

  These social networks also exist at higher levels in the organization, and they are one of the primary mechanisms for sharing knowledge and forming teams. One engineer in Nashville described the process of team formation, "Every team I have been on is cross functional. Team members are selected through the strong relationships we have with people in other groups, so we talk with people in other groups and ask them who needs to be involved."[25]

This tendency to rely on personal relationships between co-workers is mirrored by how workers' think about customers. One common techniques used by Dell managers to motivate its workers is to encourage them to identify with the customers in a personal way. One production manager told the following story,

> "We had a line that had very poor quality. The way I motivated them to do better was by asking them, 'If you ordered a system, would you want it to come out of this cell? If you buy something that isn't right-- you paid your hard earned dollars, what does that feel like? What are you going to think about that company? You should build every system as if it is going to your house.'"

This author heard at least four or five other similar stories, which sought to "personalize" customers in the minds of employees.

- **Leadership at all Levels** – Dell's Operations is starting to encourage and empower workers to lead efforts, no matter what level they are in the organization. One practical manifestation of this belief is seen in the design of Dell's Six Sigma program (called BPI, or Business Process Improvement). Instead of emphasizing black-belt training of executives and highly-skilled employees-- like GE's version of Six Sigma-- Dell's program puts more emphasis on training and engaging lower level employees. At the time of this thesis, Dell had trained over 10,000 of its 40,000 employees as either yellow belts, green belts, or black belts; and the vast majority of these individuals were yellow and green belts.[26]

Besides specific programs, Dell employees also report that they are given freedom to find solutions to the problems in their areas. In other words, they are given goals, but are not generally told how they must meet them. One production manager articulated this attitude particularly well,

> "I tell every supervisor that their area is their business. I'm going to tell you my expectations and you will report your status. I say, 'There are only two reasons I'm going to get in your business-- if someone else asks me to or you ask me to.' They should know that they control their destiny"

These four shared beliefs were found to be supported by several specific management practices and programs. These practices and programs are part of the way that the culture is promoted and sustained within Dell's operations. Figure 6 shows the specific practices that are related to the cultural elements. These practices are discussed in more detail in Section 4-B.

Author's Note: The words chosen to describe the four shared beliefs needed to balance a few different project requirements. The first requirement was, of course, accuracy. However, other important requirements were that (1) the phrases need to sound positive for communication purposes, and (2) they need to be understandable at all levels in the organization. For the most part, the words chosen fulfilled these requirements rather easily. However, the shared belief, "The Value of Personal Relationships", was a little difficult. This element describes, among other things, rich social networks that exist in Dell's

Operations. However, phrases similar to "social networks" were not considered to be easily communicable to those at lower levels in the organization. Therefore, the phrase "Personal Relationships" was decided on as a balance between accuracy and communicability.
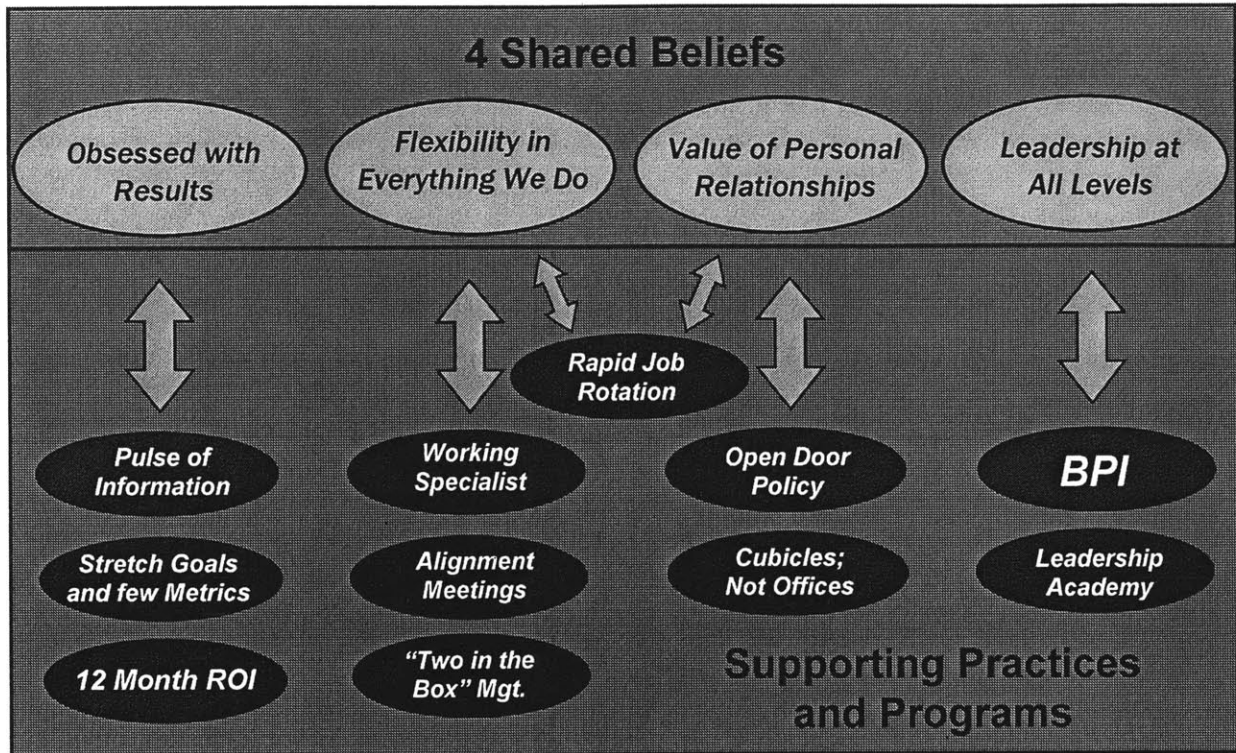
Figure 6. PowerPoint Graphic Showing the Relationship Between the Shared Beliefs and Specific Practices and Programs

B. Creating the Model

The Dell Operating Model consists of four cultural beliefs and several specific practices that are reflections of these cultural beliefs. The core of the model is the four beliefs, so the process of identifying and articulating these is discussed first.

Obsessed with Results

The first organizational belief, "Obsessed with Results" was the easiest to identify. Two of the general questions in the interviews revealed this principle. (Questions 1 and 17) In question 1, two closely related natural categories emerged-- "Results focused" and "Tactical Execution". Thirty percent of the respondents made a comment that fell into one of these two categories. Taken together, this combined category had the most comments of any other one. (See Appendix 3 for a complete description of the comments from Question 1.)

This element of the model also came out clearly in the focus groups, even though no specific ideas were presented that articulated this point. In the third focus group, for example, the group

touched on this idea three or four times throughout the session. For example, one panel member said that the longest "time horizon" for most of Dell's operations employees is 1 year, and that 80% of the average person's time is spent thinking about delivering results in the next 12 weeks. (See Appendix 4, Focus Group 3, Ideas 10 and 12.) This idea was also echoed by a participant in the second focus group, who said, "As long as you hit your metrics, no one is going to ask how you got there... as long as you didn't do anything unethical."

Finally, this concept had already started to be formalized into the language used by operations personnel. One famous quote from a Dell Senior Vice President contains the phrase, "maniacal focus on execution",[27] which was heard often by this author, both inside and outside of the interviews. Another common phrase heard by this author was "drive for results", which expresses a similar idea.

Flexibility in Everything We Do

This organizational belief was also fairly easy to identify. This concept started forming during the second focus group, which was held in Limerick, Ireland. At one point in this session, the author was presenting an idea which sought to identify "sources of stability" in Dell's operations. (Idea #10) Before the author could fully present this idea, one participant interrupted, and started a very energetic exchange of ideas about flexibility. In this conversation, the participants referenced a recent re-organization of the notebook division that was decided in one meeting. This conversation is reprinted below.

> **Participant 1:** "It's not that we are even consciously changing. We are unconsciously changing all of the time. So it's not that we are doing anything by conscious action... We've gone past that. We are at another level where it is all change..."

> **Participant 2:** "Like the reorg for the notebooks. At other companies, this would be a big talking point... and everyone would be talking about it down at the canteen. Here it happens and 'yeah' (shrugs shoulders to indicate it's not a big deal)."

> **Participant 1:** "We need a new definition of change... If you look at other companies the change in organizational structure would only happen every few years or so [as opposed to Dell, where it happens frequently]."

> **Participant 2:** "Nobody here says, 'I am a [intentional pause] this type of job person'. Next week, you will be doing something else. So you are just an employee here, and you could be doing anything when you come in. There is no boundary, 'I am a such and such and I will do this thing, whatever.'"

> **Participant 1:** "We have changed change... we are like water-- that is the analogy... It's like a liquid that allows the network to work, just like the oil in your car."

> **Participant 3:** "I have been to other companies where you all have org charts... It is a useless piece of information [here]... it is going to change... The notebook [re]org is a

classic example. Some guys will have to change lifestyle... working days to working nights. It is a huge change. [At other companies] it would be a big negotiation."

Participant 2: "It wasn't like it was a big sell. It came up as a plan, and everyone said 'yeah, go with that'"

Participant 4: "There was actually no discord at all. Everyone just agreed this is what has to be done."

Participant 3: "Compare that to change in another company, what you would have to go through and the resistance to that."

This conversation led to the development of Idea #13, "Changing the Nature of Change", which was presented to Focus Group #3 and received 20% of the votes in that session.

The idea of flexibility is also prominent in the interview data. One of the top categories of responses to Question 1 is "Personnel or Organizational Flexibility", and the top category of responses to Question 4 is "Flexibility or Adaptability". (See Appendix 3.)

The Value of Personal Relationships

This element of the model is the most interesting, because it did not initially stand out in either the interview data or the focus groups. This idea started to emerge in a focus group, and then it was correlated by some important Dell employee statements made both inside and outside the interview process. This idea was then further developed after consulting with a professor at Sloan.

This idea first surfaced during the second focus group towards the end of the discussion of Idea #10. This idea proposed that certain "sources of stability" existed in the operations organization, and that these "sources of stability" were necessary because of the rapid rate of change in Dell's operations. One participant took exception to one of the proposed "sources of stability" and proposed a new one:

Participant 1: "I wouldn't know if individual accountability would be something that you would call out as a 'point of stability'. I think the support structure is here regardless of what job you are doing."

Facilitator: "What do you mean by 'support structure'?"

Participant 1: "As in the informal org. structure and relationship-building that goes on.... Regardless of what jobs you do now or tomorrow, that's not going to change... even if I move to somewhere else, I will still be in touch with those people. ... That's the thing that allows change to go on without having an impact."

Facilitator: "Does that resonate with other people?"

Participant 5: "If I worked in another area, even if I haven't worked there.... I happen to know that [name of co-worker], he works in IT. He knows someone I worked in servers with, so I'll just go to him and he'll sort it out if I have a problem. It's almost like the canteen thing, right?"

This conversation was the origin of the idea that social networks provided some sort of benefit to Dell's operations groups. Looking back at the interview data provides some corroboration.

One question in the interview (Question #13) was about practices that improve "communication or visibility". Although this question was looking for "best practices or recent improvements" in this area, some of the interviewees decided to simply describe how they communicated with other people. Although the comments on social networks were not the dominant response to this question (See Appendix 3), they were compelling. Some of these comments appear below.

From a Manager: "The best way to find out about things is to be plugged into the informal networks. Overall, we make a B effort to get the information out there [by formal means]."

From a Supervisor: "A lot of the communication between people in different areas is very impromptu. They feel empowered to go find out about problems in other areas that might affect them. That way, many problems are caught early. People are motivated to help each other out because many of them are cross-trained so they know what it is like to work in other areas."

From a Manager: "The most effective groups and the most effective managers are those that have built networks, where communication happens verbally or by email. Like a family, we just know what the other hand is doing. I have made it a point to maintain some key contacts in order to stay in the loop on different projects."

From a Manager: "The modes of communication are by text page or word of mouth, but the word gets out [about new issues or challenges]."

From a Supervisor: "There is good communication between the supervisors, and this is how knowledge (like best practices) is transferred. If there is a problem, we go around and talk to each person individually. The key is personal communication... [The worker thinks], 'My supervisor is taking the time to talk with me, so this must be extremely important.' It is time consuming, but there is no miscommunication."

From a Manager: "Access to people is very good here. No one has an office. If you get the right person's names, you can get time and information from that person. We don't write case studies or have a library, so you have to be able to find the right people."

The importance of social networks also made sense in light of how production problems were addressed. The author discovered that although there was a formal escalation process, it was not often followed because the informal networks were quicker. For example, one senior production manager told the author, "We don't really have a defined process for escalation. An associate just knows who to contact." (This idea also received support in the focus groups. See idea 6.)

The author had taken a class with Professor Diane Burton at MIT the previous semester, and the topic of social networks was one of the themes of the class. Therefore, the author decided to call Professor Burton to see if she had any insights to the situation. Specifically, the author asked if there was any research on rich social networks causing higher levels of organizational performance (as opposed to individual performance, which is the focus of most of the social network literature). She indicated that in rapidly changing environments or in environments that require cross-functional coordination, often times social networks are important conduits for information and for "brokering" connections between individuals who need to coordinate activities.

This conversation led to the hypothesis that rich social networks actually support the speed and flexibility that almost everyone in the organization touted as organizational strengths. And this hypothesis made intuitive sense, because in a fast-paced environment, sometimes by the time a process is formalized and communicated through official means, it has already changed.

One final line of reasoning was that because Dell's operations are tightly managed for headcount, there are not a lot of extra personnel to coordinate activities and facilitate knowledge transfer between functions. Therefore, it was reasoned, this coordination had to be happening more organically.

Author's Note: Some of the articles that Diane Burton recommended are further discussed in Section 6.c. These articles also provide some external validation of the theory that the rich social networks play an important role in Dell's operations.

Leadership at all Levels

When the project started, the author met with the project sponsor, the Vice President of DAO. He told the author that he wanted the model to be part descriptive and part proscriptive. Specifically, he wanted to capture "what we aspire to do", so that the model would have staying power and could be used to guide the organization in the future. For this reason, the interview methodology included three questions about the future of Dell's operations (Questions 19, 20, and 21.).

Identifying "Leadership at all Levels" was difficult because, by definition, it was not yet a dominant organizational belief. Therefore, this element came in part from Dell's leaders and part from the interview and focus group data.

At the time of the project, Dell had started to put a stronger emphasis on leadership and development through internal management training programs as well as through communications efforts. Over the prior two years, two major management training programs had been put in place. One was called "Enlightened Leadership" and the other one was called "Developing Champions." In addition, a floor-level leadership training program called "Leadership Academy" (formerly "Supervisor in Training") was being used in DAO.

Additionally, Dell had already incorporated ideas of inclusion and engagement in its Six-Sigma program (called "Business Process Improvement"). Traditional Six-Sigma programs such as GE's or Motorola's emphasize training executives, managers, and other highly-skilled individuals. Dell, however, has put more emphasis on training employees at the lowest levels in the organization. As the VP of DAO told this author,

> "Our BPI is radically different than traditional Six Sigma. It will be interesting to see in the future which one turns out to be more successful. GE's mode is all tops-down. Our culture is not tops-down… At this point, we just want people to be engaged. We almost don't care what people are working on. Are they all aligned to one concept? No. But in my heart of hearts, I know that if I have 6000 people working on improving our processes in a measurable way, this place will be pretty darn efficient, powerful, and pretty content from a culture standpoint." [28]

This idea of encouraging leadership at lower levels in the organization was also supported by the interview data. Question 20 was the one where employees were challenged to articulate a vision of the future of Dell's operations. This question was very open-ended, so some employees articulated concrete visions like reducing delivery times, outsourcing more work, or operating in a global environment. However, approximately half of the respondents made comments about the "soft side" of the operations. The three main "soft" categories of comments were Dell's operations being a "better place to work" (27%), higher levels of "inclusion and engagement" (13%), and more opportunities for professional development and leadership (10%). Furthermore, this vision of higher levels of inclusion and engagement was articulated by people at all levels of the organization, from individual contributors to directors. (See Appendix 3 for more details on the responses to Question 20.)

Specific Principles and Practices

Once the four shared beliefs had been articulated, the author and his supervisor re-examined some of the specific practices that seemed to be important to the organization. These specific practices came mostly from the interviews, but some came from other sources. Each of the specific practices is listed below, along with a brief summary of how it was identified.

Principle or Practice	Description	Origin
Pulse of Information	Every hour a production report is generated and communicated to hundreds of people in Dell's operations. In the Americas, this report is sent via pagers or email. In Ireland, it is sent via email. These reports create a fast 'cadence" of organizational activity.	First articulated by a production manager in Ireland. It was included in the 2nd and 3rd focus groups, where it received high support.
Stretch Goals and Metrics	There is a strong cultural acceptance of stretch goals in Dell's Operations. It is common practice for a goal to be agreed to, even when the organization is not exactly sure how it will meet the goal. In addition, the goals are always tied to measurable results.	Supported by the data (e.g. Question 1). Supported by the focus groups. (See comments on Idea 7 from FGs 1 and 2.)

12 Month ROI	Dell requires all of its capital investments to have a 12 month simple payback. This emphasizes the need for attention to immediate issues.	This practice is taken for granted at Dell, so it did not come directly from interview data or focus groups. The author included it because of the uniqueness of the practice and its congruence with the culture.
Working Specialist	This is a cross-training program where certain higher-level associates learn all of the different parts of the production process. They spend part of their time on the production line and part of their time working on special issues.	This program and cross-training in general were mentioned frequently in the interviews.
Alignment Meetings	Frequent, widely attended meetings are required to keep everyone up to date and on the same page. These meetings have evolved many rules to help them run smoothly.	Frequent meetings were mentioned repeatedly in the interviews. The author subsequently learned about the rules that guide these meetings.
"Two in the Box" Management	Sometimes two people are given the same job assignment. This practice provides the benefit of management continuity if one person must be moved to a different role, and it also helps prevent management mistakes.	This was mentioned outside of the interview process as an important practice, and its benefit of organizational flexibility is obvious.
Rapid Job Rotation	It is expected that operations employees will work in a variety of roles. For production supervisors and associates, these "roles" are different parts of the production process. For managerial employees and skilled individual contributors, these "roles" are in different functions. This practice is more common in the Americas than in EMEA or APJ.	From the interview data and indirectly from the focus groups. (See Idea 6.) This practice also obviously supports network-building.
Open Door Policy	Throughout Dell (not just in operations), there is an open door policy, meaning that anyone can schedule a 1x1 meeting with anyone else in the organization.	This was mentioned numerous times in the interviews.
Cubicles; Not Offices	Dell's open door policy is reflected in its physical layout. Everyone in the organization, even Michael Dell, sits in a cubicle. Furthermore, leaders usually sit in close proximity to the teams they supervise.	Although this was mentioned occasionally in the interviews, the author identified this element as obviously congruent with the belief in the Value of Personal Relationships.
BPI	Dell's Six-Sigma program (called Business Process Improvement) encourages employees at the lowest levels in the organization to identify areas for improvement and lead the effort to improve them.	This was obviously congruent with the "Leadership at All Levels" element of the Model
Leadership Academy	The phrase "Leadership Academy" is a term in DAO that refers to leadership programs for associates (floor workers).	This was obviously congruent with the "Leadership at All Levels" element of the Model

C. *Interpreting the Model*

During this project, the author intentionally avoided trying to fit the data to any pre-defined model. Instead, he let the data define the structure of the model. This freedom led to the creation of a powerful and explanatory model that resonated with Dell's operations employees. However, the validity of this approach can be tested by looking at the results of this study through the lenses of other frameworks of organizational success and corporate culture.

In this section, the Dell Operating Model is interpreted using the following frameworks:
- the corporate culture models of Edgar Schein,
- the management performance model of Rensis Likert, and
- the Lean Enterprise Model.

At the end of the exploration of each of these frameworks, an analysis is presented to determine the value of each framework. The questions behind each of the analyses are (1) whether the framework could be used to explain the way that Dell's operations works more accurately or convincingly than the Dell Operating Model and (2) whether the model provides any additional insights that the Dell Operating Model does not.

Edgar Schein's Three Levels of Culture

Ed Schein defines three levels of organizational culture: artifacts, espoused values, and assumptions.[29] These three levels of culture interact with and influence each other as shown in Figure 7.
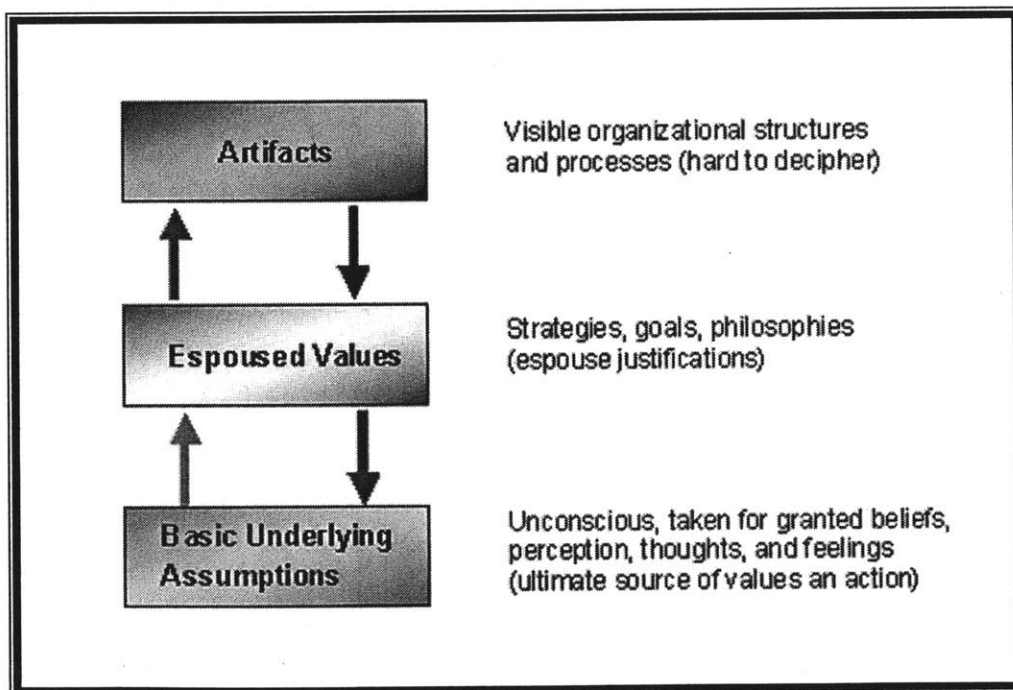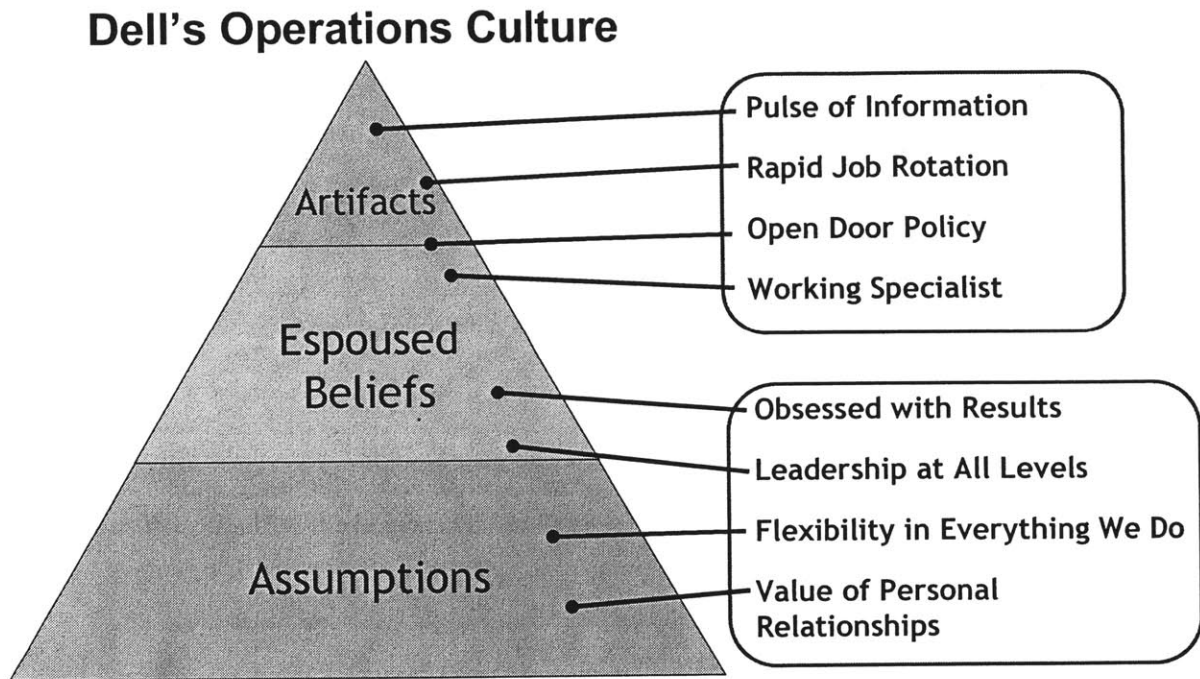

Figure 7. Ed Schein's Three Levels of Culture

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This model of culture is a useful lens for interpreting the Dell Operating Model. The four core shared beliefs of the model can be interpreted as the lower levels of Dell's operations culture (assumptions and espoused values), while the specific practices can be interpreted as the higher levels of the culture. Some of the elements of the Dell Operating Model are mapped onto the Schein model in Figure 8. (In this figure, the Schein model appears as a pyramid, which implies that the lower levels of culture are often hidden, like the bottom of an iceberg.)

Dell's Operations Culture

Artifacts
- Pulse of Information
- Rapid Job Rotation
- Open Door Policy
- Working Specialist

Espoused Beliefs
- Obsessed with Results
- Leadership at All Levels
- Flexibility in Everything We Do
- Value of Personal Relationships

Assumptions

Figure 8. Elements of the Dell Operating Model Mapped onto Schein's Three Levels of Culture

Ed Schein also characterizes different "dimensions" of culture, which span these three levels. Some of these dimensions of culture are:

- The nature of reality and truth
- The nature of time
- The nature of space
- The nature of human nature
- The nature of human activity
- The nature of human relationships

Some of these dimensions are briefly explored below, in light of the findings from this study.

The Nature of Reality and Truth – Dell's operations culture is pragmatic and metrics-based. The old saying, "If it can't be measured, it can't be managed." is especially true at Dell. There is no such thing as a "traditional" way of doing something, because the organization looks for almost anything that can move the metrics in the right direction. Dell's operations groups also prefer experimentation over analysis as a way of learning. As one interviewee said, "Teams are

given a challenge and they are given the freedom to figure out how to do it." Another said, "We 'jump over the Pareto' and do it." This willingness to try new things to achieve measurable results is a big part of what being "Obsessed with Results" means to Dell's operations.

The Nature of Time – Ed Schein points out that most organizations are primarily rooted in the past, the present, or the future. In Dell's operations, the focus is definitely on the present. One interviewee described it as a "see the hill—take the hill" mentality. There is not a strong focus on doing things the way they were done in the past or creating a common vision for the future. This focus on the present is also part of what "Obsessed with Results" means. As stated in sections 3-A, Dell's operations focuses on producing immediate results instead of engaging in long-range planning.

The Nature of Space – Everyone at Dell (not just in operations) has cubicles, and walls are kept to a minimum. Directors and VPs have larger cubicles, but they are located with everyone else in the functions they manage. This use of space sends signals of equality and access to the organization. These organizational characteristics are part of what the Operating Model refers to as the "Value of Personal Relationships".

The Nature of Human Nature – One of the best known frameworks for human nature in the business context is Douglas MacGregor's Theory X versus Theory Y. Using this framework, one could say that Dell has a blend of Theory X and Theory Y management practices. Dell's management sets aggressive goals for employees and has a "prove it to me" attitude when reviewing claims of results. On the other hand, Dell employees are generally given a great deal of freedom in finding solutions to problems. This "Theory Y" characteristic of Dell's operations is directly related to Leadership. In order to create future leaders, managers must show trust in lower level employees by giving them freedom to find solutions to problems in their areas.

The Nature of Human Activity – Dell has an attitude that "doing" is more important than "being". Reward systems are generally based on results, not education, tenure, or process.

The Nature of Human Relationships – Reward systems are generally based on individual achievement and results. Teamwork is usually not mentioned as a goal of management, but it is generally understood as necessary to get things done.

Analysis: Schein's "three levels of culture" is a useful framework for looking at the Dell Operating Model. The fact that each of the elements of the Operating Model fits neatly into a level of Schein's model gives the Operating Model a degree of external validation. Likewise, Schein's "six dimensions of culture" allows us to connect some of the principles of the Operating Model with more established organizational perspectives (such as McGregor's Theory X and Theory Y).

However, these frameworks do not yield any new information or present the existing information in a way that is any more compelling than the Dell Operating Model. In addition, if one were to use Schein's models as the basis for an organizational analysis and cultural articulation, a researcher could easily become pre-occupied with extant but irrelevant organizational traits. For example, Schein suggests that the "nature of reality and truth" in an organization can be better

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understood by thinking about whether the culture is "high or low context" or whether it has a "moralist or pragmatic" orientation. And while Dell's operations culture can certainly be dissected along these lines, these analyses would not—in this author's opinion—yield any better understanding of the way that Dell's operations works.

Rensis Likert's Organizational Profile

Likert defines two opposing world views, and he posits that all organizations exist somewhere between these polar extremes. He calls the two opposing world views "exploitive authoritative" and "participative".[30] The exploitive authoritative management style is characterized by top-down decision-making and control, limited communication and emotional ties between employees, and employees who are motivated by extrinsic rewards. The participative management style is characterized by distributed decision-making and control, high levels of communication and empathy, and employees who have balanced intrinsic and extrinsic motivation.

Likert defines eight different types of organizational processes, and he claims each process can be measured as existing somewhere between the poles of "exploitive authoritative" and "participative" culture. Likert makes this framework actionable with a survey that can be given to members of an organization. Finally, Likert presents some limited evidence suggesting that higher-performing companies engage in practices that are more participative as opposed to authoritative.

As a qualitative exercise, the author completed this survey, answering the questions as he thought an average second-level Dell manager would, and then he subsequently scored the results. (Note: The survey is designed so that it is never clear which answers will score more towards "participative" and which will score more towards "authoritative".) The results from this survey appear in Figure 9.

While this survey is entirely qualitative and only represents the perceived attitudes of Dell employees, it nevertheless offers a couple of insights into Dell's operations management practices. Most of the responses fall into Likert's ideal "participative" style or the closely-related "consultive" style. However, there are two outliers that reveal some important aspects of Dell operations management practices in areas that Likert calls the "character of motivational forces" and the "character of goal setting". (These outliers are highlighted in Figure 9.)

(1) Character of Motivational Forces - Dell has a strict rank-and-rate system for performance appraisals. Each review period, employees are given a one, two, three, or four ranking, with a "one" indicating the highest performance. About 10-15% percent of employees receive a one ranking, approximately 75% receive a two or three, and 5-10% receive a four. Employees receiving one rankings are rewarded very generously compared to those who receive lower rankings. Employees receiving a four ranking are pressured to find another group where they might perform better or to leave the company. This system creates a very competitive environment between individuals, and has worked to create a culture where individual achievement is highly valued.

(Note: Dell's "rank and rate" performance appraisal process was viewed by some operations employees as positive and by some as negative.)

(2) Character of Goal Setting – Goals are largely set at the top of the organization after consultation with lower levels. However, it is culturally accepted that goals should be very aggressive. The assistant manager at one manufacturing site described goal setting this way,

> "The top down part is, 'Hey [site manager's name], you've got to improve your productivity 20% this year. Period. The End. Go figure out how to do it.' So what happens is that he drives that to his team and asks them, 'How are we going to do it.' You could argue that the goal was top down; the method of getting there was sideways or bottom up. I venture to say that that is how most things happen around here."

Analysis: Likert's organizational profile is based on the assumption that organizations that exhibit more "participative" qualities will achieve better results. However, Figure 9 shows that Dell's operations would likely not achieve a full "participative" ranking in many areas, and that there are two areas where Dell's operations might be characterized as more authoritative. Furthermore, one of these two areas—the "character of goal setting"—was identified by many Dell employees as a very positive organizational trait. Therefore, Likert's framework is likely too simplistic for a meaningful analysis of Dell's operations.

Figure 9. A Likert Organization Profile for Dell's Operations, Completed by the Author

The Lean Enterprise Model

Although many Dell employees considered the Toyota Production System and "Lean" to be interchangeable frameworks, there are significant differences between them in terms of organizational scope, conceptual content, and specific practices. While the Toyota Production System has remained somewhat static in its content, "Lean" models have evolved considerably over the past 15 years. One organization, MIT's Lean Aerospace Initiative (LAI), has especially helped to evolve and communicate the meaning of Lean concepts to a variety of industries, both inside and outside of the Aerospace sector. Therefore, it may be useful to examine the principles and practices promoted by this group in light of the Dell Operating Model. Through this process, we will find that the principles and practices of Lean are not incongruent with the Dell Operating Model.

In its book, Lean Enterprise Value,[31] LAI defines "Lean Thinking" to be *the dynamic, knowledge-driven, and customer-focused process through which all people in a defined enterprise continuously eliminate waste with the goal of creating value.* At first glance, this statement seems fairly congruent with the Dell Operating Model and other corporate objectives at Dell. The word "dynamic" certainly seems to resonate with the ideas of being focused on results and being flexible. "Eliminating waste" is also a natural outcome of Dell's strategic focus on lowering manufacturing costs. And finally, the author attests to the fact that the concepts of being "customer-focused" and "creating value" are forcefully conveyed through other corporate communication initiatives, especially communication of the four corporate "fiscal year" initiatives.[32]

The heart of LAI's development of Lean ideas is its "Lean Enterprise Model", which consists of 12 "Overarching Practices", divided into two groups as shown in Figure 10.

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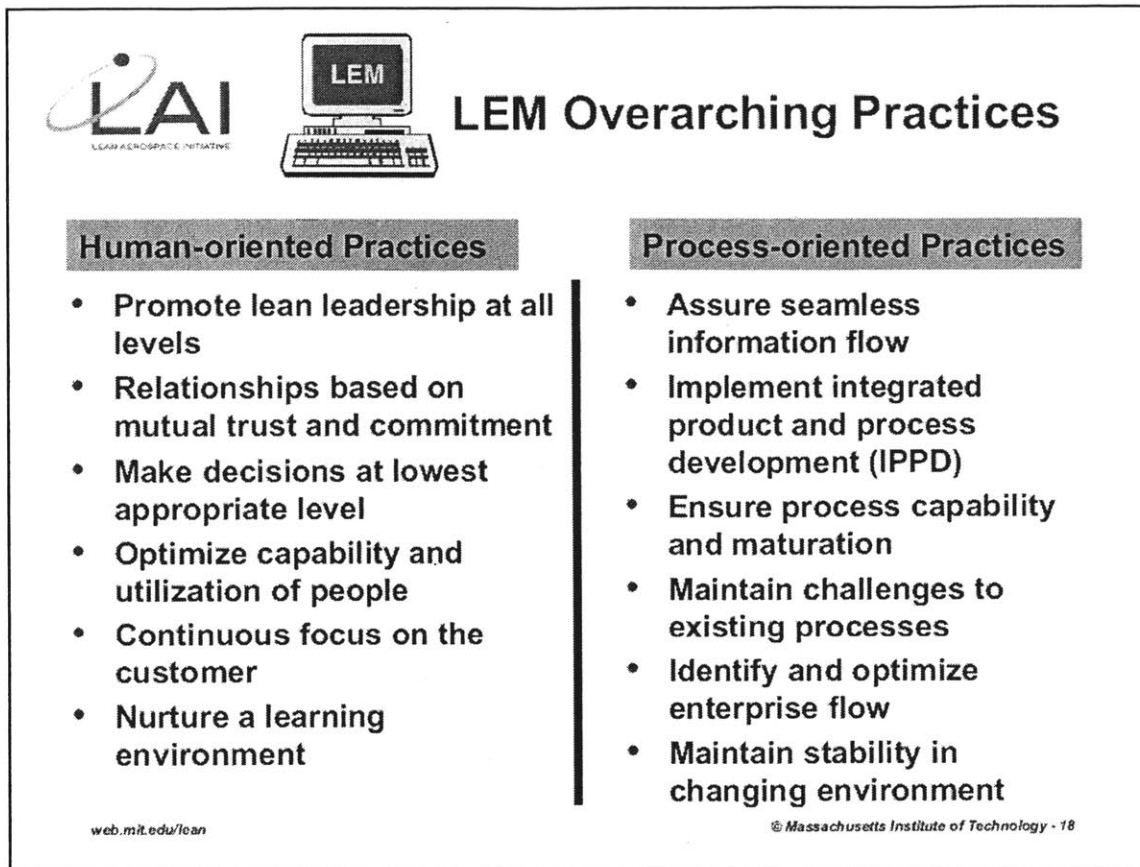
Figure 10. The "Overarching Practices" of LAI's Lean Enterprise Model

The reader, now familiar with the Dell Operating Model, will see few contradictory elements in the Lean Enterprise Model. A few of the "Process-oriented Practices" are not of the highest importance to Dell's operations or may be overly specific, but they are not contradictory. Therefore, as the author pointed out in the Foreword to this thesis, the Dell Operating Model is not necessarily contradictory to Lean principles.

Analysis: The LEM presents us with a puzzling question… If Lean concepts are actually not that dissimilar to many of Dell's practices, why has Lean as a framework not been particularly compelling to Dell's organization? The author thinks that the answer is not because of any particular differences between Dell and an ideal "Lean Enterprise", but because of the history of Dell as an organization.

First, it is important to understand that Dell is a young and successful organization, which has had little reason to look externally for other models of success. Second, Dell has had a de facto model for success, which is the characteristics embodied by and the principles espoused by its leader, Michael Dell. (See section 4-B.) Because of this history, Dell is an organization that considers itself to be different and unique from other companies. Therefore, Dell might give up part of its organizational identity if it were to fully embrace a generic framework for success, such as Lean. Therefore it makes sense that Dell would want a model that is built around its specific beliefs and that resonates with the language already used in its organization.

4. How the Model Works at Dell

A. Congruence with Dell's Business Model, Industry, and Product Characteristics

"Strategy does not need only to be congruent with the
organizational structure and the key administrative processes; but
most centrally, it has to be integrated within the corporate culture"

- Arnoldo Hax[33]

In this section, the central tasks of Dell's operations strategy are identified and compared to the four main elements of the Dell Operating Model. The congruency of the model and the strategy are then discussed.

Based on Dell's business strategy (see Section 1.B.), the operations organization is faced with the following central tasks:

- Maintaining a low level of order backlog (i.e. ensuring prompt order fulfillment), even when sales volume is changing rapidly;

- Adding order fulfillment processes for new products quickly; and

- Achieving the lowest manufacturing cost in the industry while maintaining proximity to competing firms in the areas of product quality, product performance, and selection.

In this section, we will examine how the four elements of the Operating Model help Dell's operations accomplish these three central tasks.

Obsessed with Results

Dell usually operates with less than three days of order backlog, so production downtime or other production delays are extremely costly. Any delay in production increases the risk of cancelled orders, increases expediting costs, and increases the amount of time salespeople must devote to fielding order-status inquiries.

Being "obsessed with results", therefore, means that everyone knows that they must drop what they are doing and get the situation corrected quickly. This obviously helps Dell keep the production lines running, and therefore keep backlog low. An example of how this works is the story told by a production control manager:

> "On October 31, 2003, I showed up for second-shift at the East Coast Fulfillment Center in Nashville, and our facility was faced with a seemingly impossible task. Normally, we ship about 4500 Dimension systems per day, but on that day we committed to double that amount— 9000 systems—even though our daily capacity was only 8000. When second shift started, we still had 5600 systems to go.

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> The Operations and Production Control teams quickly met and came up
> with a plan to start shipping Dimensions through the printer and
> portables lines—something that had never been done before. I knew an
> expediter, Brian Davenport, who used to provide technical support to the
> printer line, so I called him and requested his help. Even though this
> was no longer his area of responsibility, he pitched in and we were able
> to start shipping Dimensions out of the printer line within one hour of
> the start of shift.
>
> Dwayne Vinson, a first-line supervisor, helped the effort by working with
> Logistics to route trucks to the appropriate dock doors. He also led a
> team of associates, who manually sorted and loaded the systems into the
> modified shipping lanes.
>
> The Production Operations team managed the process and watched the
> numbers every 15 minutes throughout the night, and by the end of the
> shift we had exceeded our commit by 100 systems. We achieved this
> goal by challenging our assumptions, working together as a team, and
> being flexible as individuals." - Steve Herrington, PC Manager

Being "obsessed with results" also naturally means less emphasis on long-range planning. In a company that is changing rapidly, this is probably a healthy practice. In other companies with longer cycle times and more stable markets, a lot of time is spent on long range planning. However, this type of long-range planning could be a waste of resources at Dell, because most of the plans would probably change radically by the time they were implemented.

Flexibility in Everything We Do

The cultural embrace of flexibility is critical to Dell's low-cost strategy. Flexibility manifests itself in many ways, but the primary way is the expectation that employees will be able to work flexible hours and be able to work a variety of different jobs. These expectations are consistent across the associate (non-exempt hourly), managerial, and independent contributor staff roles, although the benefit is easiest to see at the associate level.

Dell changes its associate staffing levels on a weekly and sometimes daily basis. For example, if order backlog levels drop to too low for production to run efficiently, workers will often be sent home early or reassigned to other parts of the factory. These frequent changes in schedule can be disruptive on both a practical and psychological basis. Therefore, creating the expectation that schedule gyrations are "normal" is critical for Dell to execute its strategy of scaling costs with production volume. (Note: Dell is not heartless in this regard. For example, DAO helps its associates deal with the practical challenges of schedule variation by providing short-notice, on-demand child and elderly care service.)

Value of Personal Relationships

Dell's operations is a high pressure environment. By constantly pursuing stretch goals and keeping a tight lid on headcount, Dell demands every ounce of energy from its employees. Additionally, Dell uses a strict rank-and-rate system for employee evaluations which gives significant rewards to only a small fraction of the employees. At first glance, this seems like a recipe for disaster.

This type of environment could easily lead to unhealthy competition and destructive behavior between co-workers. However, this author believes that the rich social networks and the ability to communicate directly with anyone in the organization serve to counteract and neutralize this possibility. In this section, the author explores some ways that rich social networks may counteract negative organizational behaviors. (Future studies may be able to shed even more light on these mechanisms.)

Territorialism – A classic unproductive behavior is when one part of an organization tries to increase its level of influence at the expense of other parts. One necessary condition for territorial behavior is that the groups must have relatively stable membership. In other words, one group cannot effectively plot against another if the members of the group keep changing, especially if there is an exchange of members between the two rival groups. However, this is precisely what happens in Dell, especially at the higher levels in the organization.

For example, when the author arrived in June of 2003, Bob and Jim (made up names) were directors of Austin's production planning and production operations groups, two organizations that must work together very closely. However, just one month prior, they had been in each others' roles. And by September of 2003, Jim had moved into a marketing role. Bob then took over both roles for about a month until David came over from a different division to run production operations. During this time, there was also a major reorganization of the Dell America's Operations, which resulted in Bob and Jim's boss moving to a role managing call centers.

Slacking on a Team – When the work of a team benefits some team members more than others, the members who do not directly benefit may be tempted to slack off. This is especially true if the non-benefiting team members have other responsibilities and priorities that demand their time and effort. Slacking off is only possible, however, if there are few negative repercussions for the slacker. This usually means that the other team members have little influence on how the slacker is rewarded or perceived by his/her closer coworkers.

At Dell, however, the rich social networks are the mechanism for news of the slacker's behavior to go back to his/her primary organization. Furthermore, the slacker knows that the news could be transmitted through any number of different person-to-person paths. Therefore, the slacker would have a hard time proactively protecting himself from negative reports.

Backstabbing – In situations where there are limited rewards to be distributed among co-workers, this can lead to employees undermining each another. This often takes place when

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one person (let's say Person A) starts communicating directly with a manager in a position of higher authority than another person (let's say Person B). This process can only work, however, when the higher-level manager does not have adequate first-hand information about Person B's true performance. In the case of Dell, there are two reasons why the higher-level manager might, in fact, have accurate information about Person B.

First, in Dell's operations there are a wide variety of paths for communication to flow vertically in the organization. These mechanisms include electronic production reports, emails cc'd vertically to keep supervisors "in the know", 1x1 communications with employees surrounding Person B, and a variety of widely attended, daily operations meetings.

Besides rich vertical communication, another mechanism exists to prevent backstabbing. Dell, especially in the operations groups, is driven by metrics. Therefore, if one employee tries to undermine another by going to a high-level manager, the first question the high-level manager will likely ask is "show me the data". (Note: Dell even has metrics for soft organizational issues, which are measured by a semi-annual on-line survey called Tell Dell.)

Leadership at All Levels

The idea of empowering workers appeals to our senses of equality and freedom. However, encouraging higher levels of inclusion and engagement is also good for cost-control.

Whenever a floor worker leads a process improvement project, it means that one less manager is needed to meet cost reduction targets. Essentially, Dell is able to get management-level results at associate-level pay. Furthermore, this process improvement work can often be done during schedule "gaps", that are a natural consequence of a build-to-order production model. Therefore, by encouraging associates to lead improvement efforts, Dell fills these idle time gaps with value-added work, which helps keep a lid on overall wages.

Conclusion

The world of manufacturing is often compared to the military. In both situations, the organizational structure and reporting relationships must be clear, so that decisions can be made effectively and information can be transferred clearly. However, formalizing processes carries with it the risk of stifling creativity and adaptability. Formalizing reporting structures can also lead to formalizing individuals' positional power and inefficient organizational behavior like territorialism, backstabbing, or laziness.

In Dell's operations this author (and one of his advisors) observed meetings and other practices that exhibited the clarity and efficiency associated with well-defined structure and process. However, the negative byproducts often associated with bureaucracy seem to be minimal in Dell's Operations. It is this author's view that the cultural principles of Dell's Operating Model are countermeasures that mitigate these risks.

First, the social networks tend to mitigate and short-circuit inefficient organizational behavior (as was discussed previously.) Second, the emphasis on producing results means that formal

processes will be bent and molded to fit changing circumstances. As one engineer said, "If you went in one day and said that everyone must follow all the rules, we might not be as successful." Far from being a lack of discipline, the allowance of rule-bending means the organization can adapt to changing circumstances.

B. How Dell's Operations Culture is Sustained

From the interview data and the author's own first-hand observations, it appears that Dell's operations culture is sustained primarily in three ways

1. Specific management practices,

2. Hiring and promotion practices that are based on cultural congruency, and

3. The use of stories, legends, and common language.

Specific Management Practices

The Dell Operating Model identified several specific management practices that reinforce the cultural beliefs of the organization. These practices—such as 1x1 meetings, an open cubicle structure, and rapid job rotation— have been consistent over the past several years. These practices, and others, are discussed more thoroughly in Sections 3A and B.

Hiring and Promotion Practices Based on Cultural Congruency

Dell hires and promotes employees, in part, based on its shared beliefs. At the end of this author's assignment at Dell, his performance was evaluated based on the eight criteria shown below. Some of these criteria, such as numbers 5 and 6, are clearly a measure of an employee's attitude and behavior rather than measures of specific skills or training.

1. CUSTOMER FOCUS: Is dedicated to meeting the expectations and requirements of internal and external customers; gets first-hand customer information and uses it for improvements in products and services; acts with customers in mind; establishes and maintains effective relationships with customers and gains their trust and respect.

2. BUSINESS ACUMEN: Knows how businesses work; knowledgeable in current and possible future policies, practices, trends, and information affecting his/her business and organization; knows the competition; is aware of how strategies and tactics work in the marketplace.

3. FINANCIAL ACUMEN: Grasps the full meaning and interrelationships of key financial indicators on overall business performance; identifies and utilizes key financial indicators necessary to measure business performance.

4. STRATEGIC AGILITY: Sees ahead clearly; can anticipate future consequences and trends accurately; has broad knowledge and perspective; is future-oriented; can articulately paint credible pictures and visions of possibilities and likelihoods; can create competitive and breakthrough strategies and plans.

5. DRIVE FOR RESULTS: Can be counted on to exceed goals successfully; is constantly and consistently one of the top performers; very bottom-line oriented; steadfastly pushes self and others for results.

6. DEALING WITH AMBIGUITY: Can effectively cope with change; can shift gears comfortably; can decide and act without having the total picture; isn't upset when things are up in the air; doesn't have to finish things before moving on; can comfortably handle risk and uncertainty.

7. INTELLECTUAL HORSEPOWER: Is bright and intelligent; deals with concepts and complexity comfortably; described as intellectually sharp, capable and agile.

8. COMMAND SKILLS: Relishes leading; takes unpopular stands if necessary; encourages direct and tough debate but isn't afraid to end it and move on; is looked to for direction in a crisis; faces adversity head on; energized by tough challenges.

In general, an employee's evaluation with respect to these eight criteria is distilled into a 1, 2, 3, or 4 rating, with "1" being the highest; and this rating determines the employee's likelihood of receiving stock option grants, raises, and promotions. By rewarding attitudes and behaviors such as "drive for results" and "dealing with ambiguity", Dell's operations reinforces the shared beliefs that have helped make it successful.

Stories, Legends, and Common Language

The influence that Michael Dell has had on the culture of his company cannot be overstated. Over the course of 66 formal interviews and hundreds of informal conversations, this author never heard one slightly disparaging remark about the company's founder. Instead, Michael Dell is the focus of numerous positive stories, anecdotes, and attributions of character traits. Below are just a few of the more common ways in which Michael Dell is referenced by operations employees:

- One often-told story is how Michael Dell used to come to the factory at the end of each quarter and help out on the production lines. (One variant of this story is that he personally handed out $100 bills to every employee at then end of a particularly difficult quarter.)

- Michael Dell is seen as unpretentious and approachable. When he visits the production facilities, employees report that he talks with whoever is immediately around him, regardless of their level in the organization.

- Michael is held in high esteem because he is still so "aggressive" and involved with the company, despite his wealth.

Michael Dell's philosophy has also directly shaped part of the Operating Model. For example, Michael Dell is famous for saying, "Be Direct", which means (among many other things) communicating directly with other employees inside the organization. Therefore, this command is the motivation for Dell's "open door policy" and the cubicle structure of Dell's offices. And these practices are what has led—in part—to the rich social networks in Dell's operations.

Besides the legend of Michael Dell, the culture is also transmitted through a common language. Below are descriptions of several common phrases heard in Dell's operations.

- "Maniacal focus on execution" is a phrase attributed to Joe Marengi, a SVP of Dell's America's business unit.[27] This phrase has variants, such as "maniacal focus on quality" or "maniacal focus on cost".

- "Dealing with Ambiguity" is one of the "core competencies" that is used to select new employees and evaluate existing ones.

- "Drive for results" is a phrase often used to describe the attitude in Dell's operations.

C. The Adaptability of Dell's Operations Culture

Dell's operations has a strong culture that supports its business strategy. But how adaptable will this culture be to future changes in Dell's business? This question is important given the current state of research concerning the link between corporate culture and performance.

In their authoritative work, Kotter and Heskett[34] analyze the link between corporate culture and business performance, and they reach some important conclusions based on a review of the existing literature as well as their own research. Their conclusions are:

- Strong cultures, in and of themselves, do not necessarily predict good business performance, because strong cultures may be out of step with the strategic needs of the company.

- Firms with strong cultures that strategically fit their business needs often have good short or medium term business performance.

- Firms with successful "adaptive cultures" are more likely to perform well in the long run.

Kotter and Heskett define two requirements for a successful "adaptive culture"-- a mechanism for change and a stated direction for the change. The mechanisms for change may be a cultural emphasis on leadership, innovation, flexibility, and/or risk-taking. And the stated direction for change may be an emphasis on customers, stakeholders, and/or employees. Furthermore, they conclude that a dysfunctional adaptive culture is one where managers tend to think about "themselves" more than customers, stakeholders, or other employees.

It is clear that Dell's Operations culture has valuable mechanisms for change through the shared beliefs in leadership and flexibility. However, it is not clear what the dominant direction of change is in Dell's operations culture. While themes of customer focus and improving the experience of employees are prominent in official communications, it is not clear whether these messages have completely worked their way into the culture.

Dell's internal communications definitely emphasizes a focus on customers and employees. For example, the poster used internally to present the five tenets of the business model has the phrase "Beginning with the customer—Ending with the customer" prominently featured, as shown in Figure 11. In addition, two of Dell's four strategic initiatives focus on customers and employees. These initiatives are:

- Product Leadership,
- Globalization,

- Customer Experience, and
- Winning Culture (i.e. Focus on quality of employees' lives), [32]
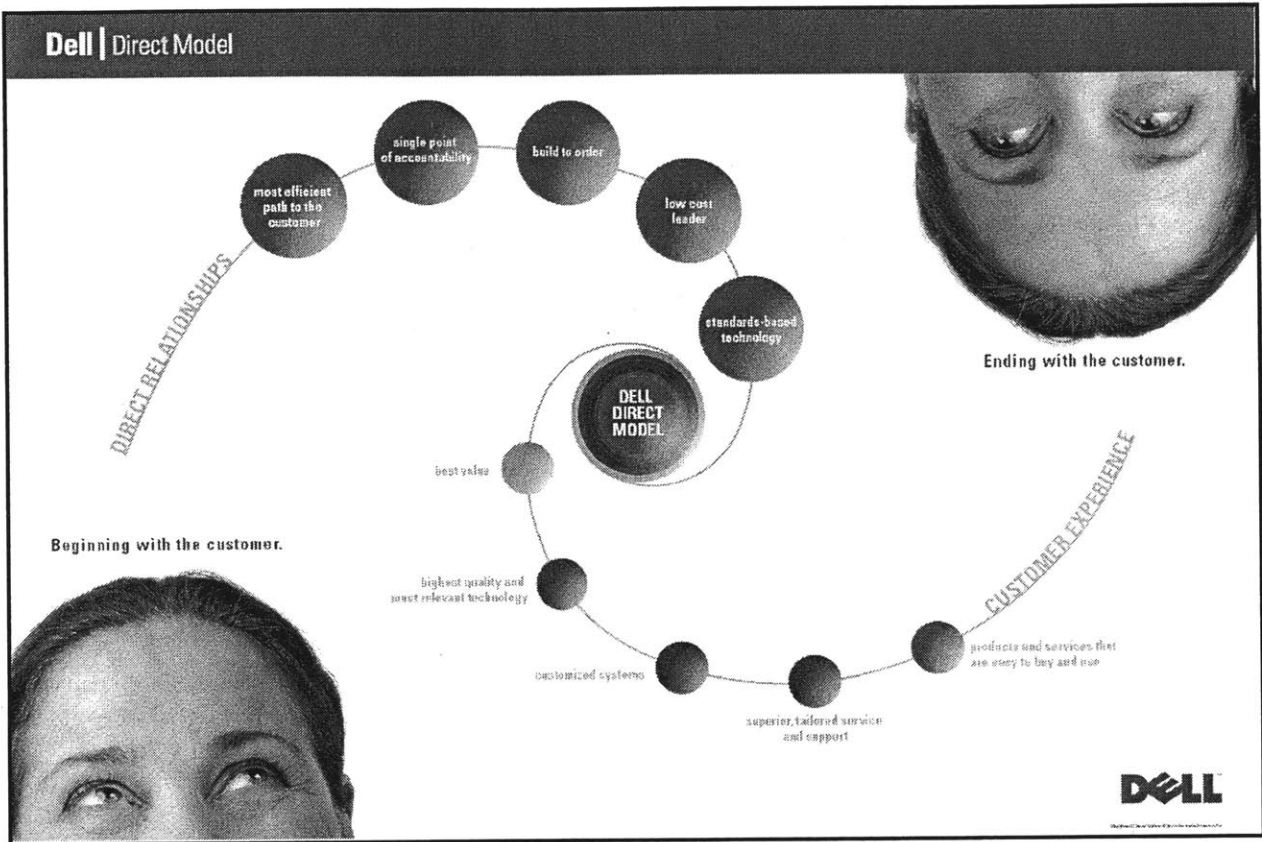
Figure 11. Dell's Internal Poster Describing its Business Model.

(Note: This is available from Dell's public website at:
http://www.dell.com/downloads/global/corporate/vision_national/direct_model_poster.pdf)

However, these foci on customers and employees are still in the process of finding their way into the operations culture. For example, out of sixty-six responses to interview question number one, only five mentioned customer-focus as part of the reason for Dell's operations success and only a handful of people made employee-focused comments (such as a positive culture, an exciting team spirit, career development, etc.).

D. Specific Recommendations to Dell

This section offers specific recommendations to Dell's Operations. The first set of recommendations concerns promoting and managing the Dell Operating Model. The second set of recommendations concerns strategic issues that are currently facing Dell's Operations.

Recommendations Related to the Operating Model

1. **Manage the social networks in operations.** The social networks in Dell's operations provide a variety of benefits to the firm. Therefore, these social networks should be managed as a valuable asset. Dell's Operations HR departments should consider contracting with a company to conduct an annual survey and analysis of the social networks in operations.

Author's Note: One Dell employee[Error! Bookmark not defined.] performed an analysis two years ago that supports the social network theory and presents an opportunity for managing this informal system more effectively. This manager examined numerous failures of the fulfillment process over a period of several months. He first looked at the following possible reasons for the failures, but found no correlations:

- Changes in the fulfillment process,

- Problems concentrated in specific functions,

- Problems concentrated in specific geographies, and

- Documented versus undocumented processes.

Then he performed an analysis of changes in specific staffing positions, and he found that 70% of the failures occurred when two people in consecutive positions in the fulfillment chain were new. He also found that an additional 18% of the failures occurred when two new people were separated by only one experienced person in the fulfillment process. He drew the following diagram to explain his analysis, using N's and E's to represent new and experienced personnel in consecutive staffing positions.

Case 1: Vendor → E → E → N → N → E → Customer
(70%)

Case 2: Vendor → E → N → E → N → E → Customer
(18%)

The conclusion from this analysis is that new employees learn from experienced employees close to them in the fulfillment process, likely through informal mechanisms. It also shows that managers can reduce the chances of fulfillment problems by simply making sure that too many new employees are not added to the process in close proximity to each other.

2. **Set up an alternative "technical development" career track, but apply it only in areas that need "deep knowledge".** Dell's operations employees tend to move quickly between different functional roles. And while this is practice is beneficial for building cross-functional knowledge and social networks, it results in a loss of "deep knowledge" that is essential for functions such as process engineering. A "technical" career track would help attract and retain individuals who want to contribute as a member of a specific function, but that don't aspire to be general managers.

   Note: Setting up a technical track does not mean that an employee would necessarily stay in one department "forever" and therefore not exchange knowledge with other parts of the organization. In fact, employees on the technical track could be required to serve on cross-functional teams as part of their performance evaluation.

3. **Adopt low-bureaucracy knowledge transfer systems.** Although the informal networks generally do a good job at transferring knowledge, employees report that sometimes information is lost or work is duplicated when employees fail to connect with each other. Therefore, Dell should consider adding some searchable fields to its personnel database that would describe projects each employee has worked on. This type of a system would be easy to implement, and it would facilitate and support the existing informal knowledge transfer processes.

4. **Consider formally adopting a fifth element of the operating model.** In Section 4-C, evidence was presented that the culture of Dell's Operations is not particularly customer-centric. Although there are strong communications efforts about the customer (such as through the business model and strategic objectives), the organization would likely benefit from a more customer-centered mindset in operations. If the Operating Model is adopted for official internal communications, management should consider expanding the message to include a statement on customer needs. (This was not done in the original model because the goal of this project was primarily to articulate existing characteristics of the operations organizations.)

Author's Note: As the knowledge of the Operating Model already exists at an implicit level in the operations organizations, it is not necessary for Dell to <u>immediately</u> adopt the Dell Operating Model as a formal communications device. However, it is recommended that all 2nd level managers and above be exposed to the model so that they better understand how their organization functions. (A first step was made in this direction when a description of the four shared beliefs was incorporated into a new managers training binder in DAO. However, this section in the training materials did not include an articulation about how specific practices and programs reinforce these shared beliefs.)

As the concepts and language of the model become increasingly accepted by managers, it will then have the traction to be effectively taught to people at all levels in the organization. Of course, the model should also be reviewed on a regular basis to make sure that it reflects the reality in the organization and that it remains congruent with Dell's business strategy and strategic initiatives as well as the critical tasks of Operations.

Strategic Recommendations

The Operating Model focuses mostly on the way Dell works internally, not with strategic issues. However, the author feels compelled to mention two important strategic issues facing Dell's operations that are closely related to the Operating Model.

Manage the Cost/Value Tradeoff— In recent years, Dell's operations have become so efficient that manufacturing now accounts for only a small fraction of total product cost. Therefore, Dell may be starting to turn a corner where speed of delivery or product quality will become more important than reducing costs from their already low levels.

In fact, some Dell employees already feel that the time has come to rebalance the operational objectives. A former director of one of Dell's marketing groups (called a Center of Competence) feels that speed and simplicity of the fulfillment process are being unfairly exchanged for cost reductions. He reported that lead times were growing, which was leading to customer frustration and lost sales.

The best way to manage this transition between cost and value is by listening to the customer. This author observed that there was no formal process for translating customer preferences into functional requirements for Dell's operations. Therefore, Dell's operations should set up its own "customer experience" group so it can gather the right data to manage the tradeoffs between cost, quality, and delivery effectively. (Of course this balancing between cost and value should never jeopardize Dell's strategic position as the low-cost leader in the industry.)

Balance Coordination and Control versus Independence and Entrepreneurship—
Historically, Dell's three world-wide business units-- including the operations departments-- have been run very independently. In the late 1990's a corporate-level organization was formed in an attempt to coordinate the activities between the three manufacturing groups. However, this "World Wide Operations" group was disbanded in early 2000 because they were "out of touch" with the rapidly changing shop-floor realities at the different sites.

In 2003, as the operations seek even greater reductions in cost, many employees have started to realize that even closer coordination and standardization may be necessary. In its pursuit of further cost reductions, however, Dell should be careful not to repeat the mistake of creating a central organization that might stifle entrepreneurial spirit and reduce the opportunities for individuals to lead change within their own organizations. In short, Dell should realize how creating a central controlling organization might actually work against some of the principles (and benefits) of the Operating Model.

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5. Applicability of the Model to Other Companies

A. Understanding the Public Literature on Dell's Operation through the Lens of the Model

At the beginning of this thesis, a review of the public literature about Dell's operations was presented. In this section, a few of those articles are re-examined in light of the findings of this project.

Park and Burrows'[5] account of Dell's management practices are generally accurate. Each of their five principles is congruent with one or more elements of the operating model. One practice from the model that they emphasize is "two-in-the-box" management. They point out that this practice helps prevent management mistakes, which seems true. However, this practice also serves to increase flexibility, because if one person in a two-person management team needs to be redeployed, the other manager can continue the role without disruption. Also, Park and Burrows' identify this practice as being important at upper management levels. But this author also observed the "two-in-the-box" approach occasionally used at lower levels in the process engineering function, where it may be particularly important to catch mistakes and ensure management continuity.

Eisenhardt and Brown's[6] idea of "time pacing" is also congruent with the beliefs of the Operating Model, especially when thinking about the end-of-quarter mentality in Dell's operations. Generally, operations experts say that pushing sales and production at the end of a financial period is an unproductive practice. However, the end-of-quarter push at Dell seems to have positive organizational benefits. First, it serves as an organization "workout" where Operations groups exercise their core skills of managing inventory, flexing production capacity, and coordinating activities with the sales functions. Second, it builds a spirit of teamwork (and therefore stronger social network ties) because everyone is working hard together to reach a clear, common goal. (In Austin, managers and engineers even celebrate the completion of a quarter by gathering at a local tavern to socialize and exchange stories.) Lastly, and probably most importantly, it reaffirms the organizational belief in producing short-term, measurable results.

The two articles published in the Human Resource Management International Digest[7,8] also identify some facets of the Operating Model. Specifically, these articles explain how Human Relations both embraces flexibility within its own organization as well as how it promotes flexibility in other parts of the company. Furthermore, these articles explain how Dell protects its culture by selecting managers based, in part, on their congruency with Dell's shared beliefs.

B. Applicability of Model to Other Companies

The learnings derived from this study of the Dell Operating Model will likely attract those who will wish to apply some of Dell's principles in their companies. The challenge for other firms is to identify the pertinent learnings and figure out how to adopt them appropriately. While a few companies may be able to benefit from adopting Dell's Operating Model directly, most will need to interpret and selectively apply these principles.

Other firms will find value in Dell's Model in one of two ways—(1) by applying most or all of the principles as a system or (2) by applying individual principles or practices inspired by individual elements of the model. This section of the thesis is designed to help firms who are considering applying the model as a whole. However, other readers may glean individual lessons by closely reading sections 3 and 4.

The author feels that the ideal candidates for Dell's model will be companies in rapidly changing industries and that have a relatively low level of product and process risk. Additionally, companies that have a low-cost strategy will probably see more benefits from the model than those pursuing other types of strategies.

Fast Industries

Companies that operate in rapidly changing, high "clock speed" industries will likely be able to benefit more from Dell's operating model than those in slower industries. In these "fast" industries, processes and products need to change frequently, which often necessitates changes in organizational structures and individuals' job assignments. Dell's emphasis on cross-training, job rotation, and best practice sharing all support the organizational flexibility which is healthy for companies in fast industries. Additionally, Dell's emphasis on results over process means that processes and systems will evolve rapidly to meet the changing needs of fast industry businesses.

"Low Risk" Companies

Companies that consider using Dell's model should be able to afford to make mistakes. This is because Dell's model relies, in part, on imperfect social networks to transfer information and coordinate actions between different functions. This type of informal system provides the rewards of lower cost and faster response while creating risks of knowledge loss and poor inter-functional coordination. Companies can determine if they are "low risk" with respect to Dell's Model by considering the following three dimensions of their industry and products:

- **Integrated versus modular products** – Integrated products require more precise and controlled coordination between different functional and technical groups. Therefore, companies that produce integrated products face higher consequences of poor inter-functional coordination, and therefore might face more risk of adopting certain elements of Dell's model.

- **Level of Capital Intensity** – Companies that must spend more on property, plant, and equipment (PPE) face higher consequences of poor information sharing and inter-functional coordination when designing or modifying their plants. If a process is suboptimal at Dell, for example, it is not expensive to re-tool a build cell or reroute a belt conveyer. However, if an automobile manufacturer wants to add or significantly modify assembly steps, the costs can be enormous.

  We can get a feel for the level of capital intensity of a company by looking at its PPE/Sales ratio. For example, Dell's PPE/Sales ratio for fiscal year 2003 was 3.7%, whereas Toyota's was 73.5%.[35]

- **Product Liability Risk** – Some companies, such as automobile and airplane manufacturers, face very high levels of product liability risk. Automobile manufacturers, for example, could suffer huge financial losses if brakes are not installed correctly, a gas tank is poorly designed, or headlights are not properly adjusted at the assembly plant. However, if a hard drive or CPU is not installed correctly in a laptop computer, a consumer is not likely to initiate and win a lawsuit against Dell. Therefore, companies like Dell face fewer legal consequences of poor product or process decisions.

Low-cost Strategy

All four elements of the Dell Operating Model have evolved, in part, from Dell's need to maintain a low cost structure. (The ways in which each of the elements support a low cost structure is discussed in Section 4-A.) Therefore, companies that pursue a low-cost strategy should benefit more from Dell's model than those companies pursuing strategies that emphasize product innovation, for example.

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6. Possible Future Areas of Research

A. Refining the Model

The Toyota Production System took over 20 years to develop and articulate[11], and it is still undergoing revisions and reinterpretations today. Therefore, this author knows that the Dell Operating Model is likely in its first stages of evolution. Additional studies of how individuals work and think in Dell's Operations will hopefully refine existing elements of the model, identify new elements, or propose wholly different perspectives on this subject.

If time permits, a future study might take more of an ethnographic approach, like that of Spear and Bowen.[12] This approach would be especially useful identifying and clarifying the embedded assumptions that guide the way people work.

Another possible study might focus on the ways in which the operations culture is perpetuated and specifically the way that new Operations employees are introduced to the culture.

B. Study of Suppliers

> "We can call our suppliers and have shipments re-routed even after they are already in transit. We can do this because we have built the relationships with our suppliers. They understand that we need them to go above and beyond for us. The other day, I needed to re-route four boxes that were already on a [supplier's name] truck. They called the truck back for me in order to grab those boxes. Also, as a courtesy, [supplier's name] palletizes some loose shipments for us, because we cannot accept loose loads in this facility."
>
> – A Logistics Engineer in Nashville

Toyota is well known for working with its suppliers to develop practices that are congruent with its own operations. Dell is also known to work closely with its suppliers on a day-to-day basis, but it does not have the same sort of "partnerships" with its suppliers that Toyota does. Therefore, an interesting question is how similar Dell's culture and practices are to those of its suppliers. And if there are similarities between Dell and its suppliers, how did those similarities come about – through a natural evolution or through intentional practices?

C. Study of social networks as a factor in Operational Success

This study indicates that social networks are important to the speed and responsiveness of Dell's operations. This raises the question of whether this is an isolated phenomenon or whether social networks might be fundamentally important to some companies' operations. This section of the thesis presents a short review of some relevant background literature and then proposes a study to shine some more light on this matter.

Review of Background Literature

Hansen and Oetinger[36] present the concept of "T-shaped Managers"—those that are networked across functions (the top of the T) and that have deep knowledge of their own functions (the vertical part of the T). These authors recommend "Replacing bloated Rolodexes with human portals". Specifically, the authors implore senior executives to identify and cultivate managers who,

> "connect people seeking information with those who can help them—effectively serving as human portals in the companywide knowledge web. Given the implicit nature of the advice that's typically called for, human portals can't simply reroute information like a switchboard. Rather, they must use their extensive knowledge about who knows what and their understanding of what actually is needed to creatively make connections between information seekers and information holders"

In The Social Life of Information, Brown and Duguid[37] discuss the dangers of relying on systems that ignore the importance of human interaction. They pan the ideas of IT-enabled home-based work, offices without borders (hoteling), and remote human interaction of all sorts. They point out the importance of knowledge transferred through chance encounters, non-verbal communication, and storytelling.

These authors summarize a study done by a researcher named Julian Orr in 1996. Orr conducted an ethnographic study of Xerox technical service reps and made two observations:

- The official job of the technical service rep was highly specified by business processes, training manuals, and database-held knowledge.

- In reality, the technical service reps formed social groups where real knowledge was created and shared. In particular, he found that knowledge of problems was transferred in narrative fashion—through stories. The stories provided an entertaining and meaningful mechanism for the knowledge to pass from person to person in the network.

When Xerox was presented with Orr's findings, it sought ways to support these social networks by, for example, giving the reps two-way radios so they could easily communicate with each other throughout the day.

Although Baker[38] focuses on the traditional, individual-centric perspective on social networks, he alludes to the value that rich social networks can have for an organization in the final section of his book. This section is low on details and analysis, but high on inspiration. In particular, he quotes Jack Welch in the General Electric 1990 Annual Report:

> "Our dream for the 1990s is a boundaryless Company, a Company where we knock down the walls that separate us from each other on the inside and from our key constituencies on the outside.
>
> The boundaryless Company we envision will remove the barriers among engineering, manufacturing, marketing, sales, and customer service; it will recognize no distinction between 'domestic' and 'foreign' operations—we'll be as comfortable doing business in Budapest and Seoul as we are in Louisville and Schenectady. A boundaryless organization will ignore or erase

group labels, such as 'management', 'salaried', or 'hourly', which get in the way of people working together."

Outline of Proposed Research Project

The research project would begin with the selection of ten or more firms with industry characteristics and operations strategies similar to Dell's. (See Section 5-A.) The researcher would conduct a quantitative and qualitative study of the social networks by randomly choosing individuals and interviewing them about their relationships with others in the organization. The following are dimensions of the social networks that might be measured by this survey:

1. The size of the average social network
2. The relative number of strong versus weak ties in the average network.
3. The extent to which ties transcend functional boundaries.
4. The extent to which ties transcend hierarchical boundaries.
5. The extent to which any of the first 4 variables is related to an employee's level in the organization.

A statistical model would then be developed to test for strong correlations between these measurements and various measures of business performance, such as growth of net income, return on equity, and stock price. (These are the same measurements chosen by Kotter and Heskett.[34])

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[12] Steven Spear and H. Kent Bowen, "Decoding the DNA of the Toyota Production System". Harvard Business Review, September-October 1999, pp. 96-106.

[13] Conversation with Tim Ingle, Toyota Motor Company. November 13, 2003.

[14] Information presented in this section was synthesized from personal interviews with Chris Castello, Stephen Cook, Satish Patil, and Bruce Raven in August 2004.

[15] Personal interview with David McGuire, November 24, 2003.

[16] Information presented in this section came mostly from a personal interview with Niall Tuite on August 14, 2003.

[17] James Womack and Daniel Jones. Lean Thinking. Simon & Schuster 1996.

[18] This is the author's interpretation of CFM based on internal Dell slide decks and resources available on the world-wide-web. CFM seems to be a process improvement framework that was not differentiated enough from other frameworks to ever become very popular.

[19] John Godfrey Saxe, The Blind Men and the Elephant (A poem based on an Indian fable.)

[20] This goal statement is a bit presumptuous, because it implies that we might actually be able to discern some ultimate truth about this organization. In reality, what we really did was to identify what Dell employees believed to be the reasons for their success. Therefore, this goal should likely have been stated as, "identify the essential beliefs, principles, and practices that Dell's employees believe have made Dell's operations successful".

[21] John Van Maanen, "Different Strokes: Qualitative Research in the ASQ from 1956 to 1996", Essay in Qualitative Studies of Organizations. Sage Publications, Thousand Oaks, California. 1998.

[22] Steinar Kvale, Interviews: An Introduction to Qualitative Research Interviewing. Sage Publications, Thousand Oaks, California. 1996.

[23] These three criteria are very similar to the "research, mythic, and pragmatic" imperatives in process of creating a learning history. Senge, Peter, et al. The Dance of Change: The Challenges to Sustaining Momentum in Learning Organizations.

[24] This is very similar to Toyota's attitude towards standards.

[25] This reference, like many others in this thesis, came from the interview data. Although the interview data is based on actual interviews, sometimes the transcription process condensed words or phrases to make a thought more coherent. Therefore, some of the quotes in this thesis may not be 100% accurate.

[26] Personal interview with Bill Grundstrom, a senior manager in Dell's BPI program. March 23, 2003.

[27] Benjamin Pimentel, "Dell's Big Sell: Forays by Texas Computer-maker Pit it Against Valley's Giants". San Francisco Chronicle, April 13, 2003.

[28] Personal Interview with Dick Hunter, September 25, 2003.

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[36] Morton Hansen and Bolko Oetinger, "Introducing T-shaped Managers", Harvard Business Review, March 2001 pp. 107-116.

[37] John Seely Brown and Paul Duguid, The Social Life of Information, Harvard Business School Press, 2000.

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Appendix 1: List of Interview Questions

The actual questions asked in the interviews were defined by two central research questions, and the first research question had three different categories of questions within it. The two central research questions are shown below along with the corresponding actual interview questions.

Central Question 1: What have Dell's operations groups been doing that have made them so successful?
- Very general and open-ended questions (Questions 1, 17, 18, and 22)
- Questions about basic management practices (Questions 3 through 7)
- Questions about specific practices related to improvements in the day-to-day operations. (Questions 8 through 16)

Central Research Question 2: What are employees' aspirations of what Dell operations could be like in the future?
- Questions about the future of the operations (Questions 19 through 21)

Question Number	Actual Question
1	As you can see from the information I gave you yesterday, we will be going into a bit of detail looking for best practices and things that have made Dell's Operations successful. However, before going into any detail and without me prompting you in any way, what would you say have been the reasons for the success of Dell's Operations groups?
2	How about in the area of Personnel Management? By this I mean recruiting, hiring, and formal and informal ways people are evaluated. Is there anything in this area or does this remind you of any best practices or reasons for Dell's Operations success?
3	How about in the area of using financial information? I know this is a broad area, but what I mean is any way financial information is used to make decisions or capital budgeting or operating budgeting processes. Is there anything in this area or does this remind you of any best practices or reasons for Dell's Operations success?
4	How about in the area of Organizational Culture? Is there anything in this area or does this remind you of any best practices or reasons for Dell's Operations success? (If interviewee is having difficulty, "Org. culture is the language people use, the way people interact, the generally unspoken way that things are done...the unwritten rules of the game, if you will.")
5	How about in the area of Knowledge Building? By this I mean how Dell's Operations groups either learn from other companies, learn from their own past work efforts, or how knowledge is shared between different groups. Is there anything in this area or does this remind you of any best practices or reasons for Dell's Operations success?
6	How about how people are organized to get work done? What I mean by this is... as you know, in some companies, work is done within individual functions. In others, cross-functional team work is emphasized. And there are many other ways that the right people get on the right work efforts. Is there anything about how Dell gets the

	right people on the right work efforts that you would say is a best practice or does this remind you of any best practices or reasons for Dell's Operations success?
7	First we will talk about uptime. Are there any specific practices or specific tools that help keep uptime high? Or have there been any recent improvements that have been made that have contributed to increased uptime?
8	How about keeping processes stable and repeatable? In other words keeping processes consistently producing the same output every time? Any specific practices, tools, or recent success stories with regard to that attribute of an operation?
9	How about maintaining and increasing high throughput rates? Any specific tools or practices that have help increase throughput? Or are there any recent improvements or success stories in that regard?
10	How about increasing productivity-- doing more volume with the same number of people? Any specific tools or practices that have help increase productivity? Or are there any recent improvements or success stories in that have increased productivity?
11	How about in the area of quality-- either preventing errors or to a lesser extent catching errors? Any specific tools or practices that have help increase quality? Or are there any recent improvements or success stories with respect to quality?
12	How about in the area of flexibility-- whatever that means to you in your operation? Any specific tools or practices that have helped your processes to be more flexible? Or are there any recent improvements or success stories in that regard?
13	How about in the areas of communication and visibility-- and you can answer this at any level from associates to managers? Any specific tools or practices that have helped increase communication or visibility? Or are there any recent success stories in this area?
14	How about in the area of safety? Any specific tools or practices that have helped increase safety? Or are there any recent improvements in safety?
15	How about in the area of worker effectiveness? In other words making sure that employees are adding value all the time. Things like work instructions, tools, and training fall into this category. Any specific tools or practices that have increased...
16	How about keeping workers motivated? With all the demands that Dell makes on its operations employees, how do people stay excited about coming to work? Any specific tools or practices that have increased workers' motivation? Or are there any recent success stories in this area?
17	We are nearing end of the part of the conversation where we are identifying practices that have contributed to the success of Dell's Operations groups? But before we finish, is there anything else that came to mind that we did not get a chance to talk about?
18	This project is clearly intended to identify the best parts of Dell's Operations. However, sometimes to identify the best parts of an organization, you must spend a little time identifying areas that might need improvement. If you had to quickly identify one or two potential areas for improvements in Dell's Operations groups, what would they be?
19	Now we will start thinking about the future of Dell's Operations. If you had to identify one thing that Dell must do well in its Operations groups to be successful in

	the future, what would it be? This can be something that is going well now, something that needs improvement, or something entirely new.
20	Imagine Dell in 3 to 5 years. The company is doing well financially overall; the operations are running smoothly; it is a good place to work. Do you have any more specific images of what that might look like or that you personally would like it to look like?
21	The last question is focused on the specific operation(s) you are involved with. If you had a magic wand and could change, overnight, one thing about the way that the operations work, what would it be?
22	Now you have a pretty good idea of what this project is about. Do you have any thoughts you would like to share about the project, in general?

Appendix 2: Interview Database Structure

Relationships

Geograhic Region
Geographic Region Code
Geographic Region

Prior Functions
Interviewee ID
Function Code

Function Codes
Function Code
Function Name

Interviewee
Interviewee ID
Name
Job Level Code
Levels from OOC
Business Unit
Geographic Region Code
Function Code
Years at Dell

Comments
Interviewee ID
Question ID
Comment

Prior Companies
Interviewee ID
Prior Company

Questions
Question ID
Actual Question

Appendix 3: Summaries and Samples of Interview Data

Notes about Interview Data

(1) The categories of comments were developed from the patterns in the data for each question.

(2) Most of the comments touched on more than one idea. Therefore, these comments were often counted as belonging to more than one category. However, each comment was allowed to be counted in no more than three categories. In Question 1, for example, each comment was counted as belonging to an average of 2.3 categories. Figure A below shows an example of how this was done. This figure presents a small section of the spreadsheet used to categorize the comments to Question 1. (Some comments do not show votes because all of the categories are not shown in this image.)

(3) The comments selected for each question are approximately representative of others. However, the approach to selecting the comments was strictly qualitative.

(4) The representative quotes that are presented often contain numbers in parentheses. These numbers were inserted by the author to indicate breaks between main ideas.

Interviewee ID	Question ID	Comment	Direct Model	Simple Metrics	Personnel/ Organization Flexibility	Global Optima	The people	Personnel Mangt.	Winning Team/Cult.
						Categories			
1	1	(1) We have one strategic goal that everyone can rally behind. This allows us to work more cross-functionally. (For us it is DPO.) It is also about having a common language. (2) Another main thing is prioritization. We look for what is best for Dell, not what is best for each individual's group.		1		1			
2	1	The people we hire are risk takers, motivated, and creative. Second, our aggressive desire as a company to take risks, like to move laptops to Malaysia.					1		
3	1	The most important thing is increasing throughput in manufacturing. This strategy has other positive benefits such as in logistics and in demand/supply. It puts a greater emphasis on developing better tools and processes in other parts of the organization.							
4	1	We are great at executing because we know we are on a winning team. Also, we are constructively dissatisfied with everything we do. We are always looking to do things better.							1
6	1	The biggest thing is understanding the velocity of material and how that relates to the cash conversion cycle.							
7	1	Speed and flexibility-- speed at making decisions at all levels. Dell is a company where you don't have to get multiple approvals. We make decisions quickly because we are in constant communication with each other. The internet is a big part of how we communicate so quickly. We don't use voicemail or paper much... the communication by email and pagers is near real time. (2) The other thing is how we work with our supply base and keep our inventory down.			1				
8	1	The keys are being fast and flexible. We are constantly revamping our production processes. We are never satisfied, and our people allow us to do that. I don't think our success is about a process; it is about people who have the right attitude. My opinion is that many of the original people had the mindset that they needed to change and adapt to survive, so that became the culture and the norm. That idea of survival still exists here.			1		1		
9	1	(1) The Direct Model... That philosophy and mindset provides some operational advantages such as low inventory. (2) The IT systems are very good at exploding the parts for an order and giving that information to you almost instantaneously. (3) We are very people focussed. The processes are very tactical and are run by the dedicated people who work here.	1						

Figure A. An image of part of the spreadsheet used to categorize responses to Question 1.

Question 1: As you can see from the information I gave you yesterday, we will be going into a bit of detail looking for best practices and things that have made Dell's Operations successful. However, before going into any detail and without me prompting you in any way, what would you say have been the reasons for the success of Dell's Operations groups?

Breakdown of comments made by 10% or more interviewees

Category Name	Percent Responding	Notes about category
Always Improving	24%	Comments about the general cultural assumption that processes, systems, etc. should always be improving.
Personnel/ Organization Flexibility	24%	Comments about people being flexible with work hours or job assignments. Includes comments about how fast the organization can respond and react to changing circumstances.
Simple Metrics	21%	Comments about "metrics", "simple metrics", or statements about how simple the objectives are, in general.
Direct Model	17%	Comments about the "business model", "the direct model", or the "build-to-order model".
Tactical Execution	15%	Comments about "execution" and working hard to produce day-to-day results. Includes comments about how much "focus" there is on different issues.
Results Focused	15%	Comments about "driving for results", being "results-focused", overcoming obstacles, and preferring learning by doing over studying a problem.
The People	12%	Any comments focused on the characteristics of the people who work in operations. These characteristics include the people's backgrounds, intelligence, or drive, for example.
Personnel Mangt.	11%	Any comments focused on specific intentions or actions of management.
Winning Team/Cult.	11%	Comments about "winning culture", being on a winning team, or about how success builds upon itself, for example.
Workforce Engagement/ Autonomy	11%	Comments about giving lower-level employees authority and including lower level employees in decision-making processes.

Sample of Comments from Question 1

Level in the Organization	Comment
Senior Manager	(1) Speed and flexibility-- speed at making decisions at all levels. Dell is a company where you don't have to get multiple approvals. We make decisions quickly because we are in constant communication with each other. The internet is a big part of how we communicate so quickly. We don't use voicemail or paper much... the communication by email and pagers is near real time. (2) The other thing is how we work with our supply base and keep our inventory down.
Senior Manager	The keys are being fast and flexible. We are constantly revamping our production processes. We are never satisfied, and our people allow us to do that. I don't think our success is about a process; it is about people with the right attitude. My opinion is that many of the original people had the mindset that they needed to change and adapt to survive, so that became the culture and the norm. That idea of survival still exists here.
Senior Manager	(1) The Direct Model has really made Dell successful. (2) I believe we are also very successful at managing people. (3) We also drive our people for results.
Manager	(1) We focus on execution day-to-day more than any place I have ever been. (2) People are held accountable to a clearly defined performance plan. (3) Also, we really understand what our cost structure is top to bottom, without using complex analysis.
Director	(1) Our teams have a "can do anything" attitude. The main reason for this is that teams are given a challenge and they are given the freedom to figure out how to do it. (2) You also have a good blend of experience and new talent fresh from school.
Individual Contributor	We are able to execute and react. This is not the best of conditions, but it works. Everyone here wants to be successful, so sometimes people don't follow the every procedure.... If you went in one day and said that everyone must follow all the rules, we might not be as successful. This is because failure is really not an option here. At my previous company, rules were more important, and everyone ended up blaming each other when things didn't go well.
Manager	The culture was built on a military mentality. "This is the job; let's go get it done." We are changing now, but the "drive for results" mentality has never left.
Director	(1) Teamwork. Of all the different places I've worked, all the functions here work towards a common goal. There is not a lot of finger-pointing. (2) Also, we are a very metrics driven company. (3) Even at the highest levels of this company, you are expected to know details about the daily operations.
Supervisor	(1) It is the focus on the people. We know that we need to find the right balance between what is right for the business and what is right for the people. I think there is a strong commitment between the employees and the company. (2) We are always experimenting and trying new things out. The creativity here is overwhelming. We are trying things here that other companies are afraid to try.
Supervisor	(1) Teamwork. We have a team that can jump into other areas. They are flexible, which makes the team more cohesive. (2) Also, you get a feeling that people are driving for something... to be the best of the best in every metric. (3) Training and self-development ensures that people can move into other slots quickly.
Manager	(1) We keep improving in all our metrics, and we are constantly changing our production lines. (2) Also, our people are very committed. This is because everything is running so fast, you have to be "full on".

Question 4: How about in the area of Organizational Culture? Is there anything in this area or does this remind you of any best practices or reasons for Dell's Operations success?

Breakdown of comments made by 10% or more interviewees

Category Name	Percent Responding	Notes about category
Flexibility/ Adaptability	34%	Comments about people being flexible with work hours or job assignments. Includes comments about how fast the organization can respond and react to changing circumstances.
Results Focused	24%	Comments about "driving for results", being "results-focused", or overcoming obstacles.
Team- work	22%	Any explicit comments about teamwork or good coordination between functions or individuals.
Empowerment/ Independence	20%	Comments about giving lower-level employees authority and including lower level employees in decision-making processes. Includes comments about individuals having the freedom to find their own solutions to problems.
Never Satisfied	17%	Comments about people always trying to improve the processes and systems they are working with.
Openness/ Sharing Information	17%	Comments about good communication between groups, how employees are open to different ideas, or comments about easy access to information.
Individual Accountability	15%	Comments about not "passing the buck", employees living up to commitments, and management not tolerating failure.
Expect to Win	15%	Comments about "winning culture", being on a winning team, or about how success builds upon itself, for example.
Competition	10%	Comments about competition between peers, competition between sites, or general comments about a "competitive environment".
Tactical Execution	10%	Comments about "execution" and working hard to produce day-to-day results. Includes comments about how much "focus" there is on different issues.

Sample of Comments from Question 4

Level in the Organization	Comment
Senior Manager	The rigor around metrics is part of our culture. We also have flexibility in dealing with other organizations. Employees can talk to other employees [in different areas] about ideas without worrying about the chain of command. There is a lot of openness.
Supervisor	(1) We hold people accountable. Management really stays on top of issues and they follow up on people's commitments. (2) We also encourage people to take an interest in the business. Employees should know how many systems we built yesterday, for example.
Director	We do not accept failure. We relentlessly pursue being successful; other companies are complacent, but not us. (However, we need to reward intelligent mistakes or those that lead to other improvements in other areas.) Also, there is great access here to key leaders.
Manager	We expect to be successful and be the best. There is not tolerance for just being satisfied.
Individual Contributor	Decision-making is now more inclusive. We now always get input from the workers who are actually doing the job.
Manager	The mentality of setting a goal without a clear line of sight of how to do it is definitely a key to success. Other companies just don't do that. Dell can do that because of its history of success using this practice.
Director	There is a growing culture of empowerment, largely through BPI. Now even associates can drive change.
Senior Manager	We have a very driven culture. We are still very focused, and that comes from Michael Dell. You have to respect a guy that has billions and is still so aggressive.
Manager	We know that the "buck stops here"; also, we will do whatever it takes to get a job done. Also, everyone just accepts the changes at the end of the quarter, for example; no one questions it.
Manager	Here you get into activities with your body, mind, and soul. It's like being in the eye of a storm.
Supervisor	'(1) Differences in opinion are encouraged here, and meetings can get heated. But everyone is looking for the best solution. (2) We work a lot of hours here, and this brings us closer than in a lot of other places. (This makes it easier to disagree.)
Supervisor	(1) There is a big focus on root cause here; it's not just half way. If one function says that they don't understand why something happened, that is not acceptable. (2) There is also no passing the buck... if something affects your area, you can't just say, "Well I told engineering, and they didn't fix it." (3) We also have a lot of freedom to be creative in finding ways to meet goals. We make a lot of mistakes, but that's OK if it was a good effort and you learn from it.
Manager	There is a lot of competition between the different plants, so that is part of our culture. We know Dell as a company will win; we [in Limerick] just want to be on the team.
Individual Contributor	'The workforce is very flexible. We do whatever it takes to adapt to the market. I have never seen this at another company.

Question 10: How about increasing productivity-- doing more volume with the same number of people? Any specific tools or practices that have help increase productivity? Or are there any recent improvements or success stories in that have increased productivity?

Breakdown of comments made by 10% or more interviewees

Category Name	Percent Responding	Notes about category
Reducing Steps	21%	Comments about eliminating steps in processes, eliminating "touches", or generally refining existing processes (as opposed to completely redesigning them.)
Visible Individual Feedback	17%	Comments providing performance feedback to individuals. Most of these comments are about associated on the assembly lines.
IT Enabled Processes	15%	Any comment where it seemed that an IT tool was a significant part of bringing about the increase in productivity.
Stretch Goals/ Big Improvements	13%	Comments about how seeking large improvements was more beneficial than seeking incremental improvements.
Vendor Changes/ Outsourcing	11%	Comments about outsourcing parts of processes, purchasing more integrated sub-assemblies, or any other change that resulted in vendors performing more work.
Personnel Flexibility/ Cross-training	11%	Comments about cross-training or employees being flexible with respect to their day-to-day work
Process Reengineering	11%	Comments about major changes to processes, especially if they included changes in many dimensions (physical systems, IT systems, work flow, etc.)
Better Products/ DFM	11%	Comments about how new product designs make manufacturing easier.

Question 18: This project is clearly intended to identify the best parts of Dell's Operations. However, sometimes to identify the best parts of an organization, you must spend a little time identifying areas that might need improvement. If you had to quickly identify one or two potential areas for improvements in Dell's Operations groups, what would they be?

Breakdown of comments made by 10% or more interviewees

Category Name	Percent Responding	Notes about category
Invest in IT	24%	Comments about the lack of IT resources or the need to make IT systems more robust.
Better Coordination b/w groups	22%	Comments about improving either the communication or coordination between functional groups or different work sites.
Improve Culture	12%	Comments about improving the culture.
Improve Work-life Balance	8%	Comments about people having to work too much overtime.
Communicate Better with Associates	8%	Comments about improving communication between managers/supervisors and associates.
Appreciate People More	8%	Comments about needing to increase employees' intrinsic motivation or acknowledging employees' efforts more.
Longer Term View	8%	Comments about the need to engage in more strategic planning, creating a vision for the future, or reducing the amount of short-term thinking.

Question 19: Imagine Dell in 3 to 5 years. The company is doing well financially overall; the operations are running smoothly; it is a good place to work. Do you have any more specific images of what that might look like or that you personally would like it to look like?

Breakdown of comments made by 10% or more interviewees

Category Name	Percent Responding	Notes about category
Better Place to Work	27%	Comments about improved work-life balance, employees being excited to come to work, or there being more job satisfaction.
Integrated, global company	21%	Comments about improved coordination between global sites or other images of more "global" operations.
E&I at Lower Levels	13%	Comments about lower level employees leading efforts, self-directed work teams, or better communication and understanding of the business at lower levels in the organization.
Better IT Systems	11%	Comments about having more robust or effective IT systems or tools.
Prof. Development/ Leadership	10%	Comments about employees having more opportunities for professional development and leadership or how Dell's operations will have better leadership in the future.
Flexibility	10%	Comments about employees working flexibly with respect to their work hours or job assignments. Includes two comments about having more manufacturing flexibility.
Supplier Relationships/ Outsourcing	10%	Comments about suppliers performing more functions for Dell or taking over some of the existing operations.

Question 20: Now we will start thinking about the future of Dell's Operations. If you had to identify one thing that Dell must do well in its Operations groups to be successful in the future, what would it be? This can be something that is going well now, something that needs improvement, or something entirely new.

Breakdown of comments made by 10% or more interviewees

Category Name	Percent Responding	Notes about category
Retain People	20%	Comments about needing to retain people, appreciate people, or increase employees' access to professional development opportunities.
Drive Cost Down	17%	Comments about reducing costs. Includes one comment about "efficiency" and one about "reducing waste".
Global Capabilities	15%	Comments about improving coordination between global sites, shift production between global sites, or other "global" concerns.
Improve Functional Coordination	12%	Comments about the need for different functions or different regional sites to work better together.
Customer Focus	11%	Any comments about listening to and addressing customer needs.
Personnel or Organizational Flexibility	11%	Comments about people needing to be flexible with work hours or job assignments. Includes comments about maintaining organizational agility.
Common Vision	11%	Any comments about how employees need to have "a common vision" or "alignment". Includes comments about the necessity of plans or road maps for how the operations will evolve.

Appendix 4: Images of "Ideas" from the Focus Groups

Focus Group 1 -- Idea 1

Focus Group 1 -- Idea 2

Focus Group 1 -- Idea 4

Focus Group 1 -- Idea 5

Focus Group 1 -- Idea 7

Focus Group 1 -- Idea 6, Part 2 (Part 1 is on next page)

Dell's Operations Managers believe that people are happiest and perform the best when (1) ambitious goals are set from above, (2) employees are supported from below, and (3) employees are given the freedom and authority to lead change within their area of responsibility.

LEADERSHIP SUPPORT

MUST ADDRESS LACK OF GREEN ARROWS

Ambitious Goals Set from Above — COLLABORATIVE?

Give Freedom and Authority in the Middle

Provide Support from the Bottom

Training Access to Info Advocacy Coaching

Focus Group 1 -- Idea 3

"FUNCTIONAL ROLES ARE OPTIONAL"

Dell's Production Lines are Kept Running Because They Have a "Web of Support"

Production Step A Production Step B Production Step C

Henry Ford

Production Step A Production Step B Production Step C

Toyota

Production Step A Production Step B Production Step C

Dell

Focus Group 1 -- Idea 6, Part 1

Focus Group 1 -- Idea 8

Focus Group 1 – Evaluative Criteria

Dell's Operations Groups Are Successful Because They Are an "Elite Winning Team"

- The individuals on the team are self-motivated and "driven" to succeed.
- There is a strong pride associated with being on the team.
- There is competition for the best spots on the team.
- The team runs on principles of a meritocracy.

HEALTH COMPETITION

Simple Metrics Support Flexibility Because They Provide a Solid "Bearing Point" for Action

There are times during projects when the exact process or the right solution may be ambiguous. There will also be times when plans need to change because of changes in the external business environment or because better ideas are discovered. During these times of change, Dell Operations' simple metrics provide a source of stability that allows projects to move forward.

Successful metrics at Dell have some or all of the following characteristics:

- They Should Be Simple and Scalable
- They Should Be Closely Related to the Customer Experience
- There Should a Limited Number of "Most Important" Metrics.

MEASURABLE & RELIABLE

FREQUENCY

OPEN

NOTE BOB IS ABOUT METRICS, NOT PROCESS

METRICS = RESULTS > PROCESS

Focus Group 2 -- Idea 4   Focus Group 2 -- Idea 5

Dell's Production Lines are Kept Running Because They Have a "Web of Support"

Henry Ford

Production Step A | Production Step B | Production Step C

Toyota

Production Step A | Production Step B | Production Step C

Dell

Production Step A | Production Step B | Production Step C

Focus Group 2 -- Idea 6, Part 1
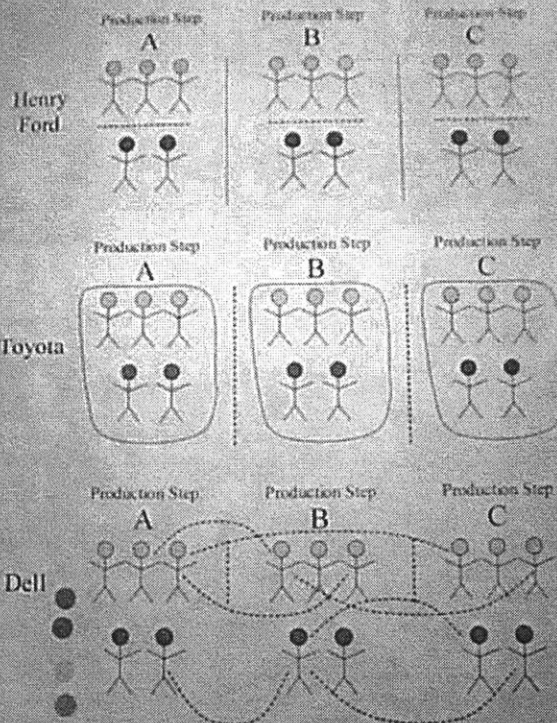
This web of support is created by a collection of management practices and cultural elements:

Practice	Benefit
Very frequent, widely-attended production meetings	Employees are exposed to issues not directly related to their work.
Rapid, lateral job rotation	Employees know how to do multiple jobs, which creates breadth of knowledge.
Widely accessible IT tools	Everyone can see the problem first-hand.
Rich informal networks	Informal networks are more efficient than defined teams or defined escalation processes.
Reliance on teams of peers for feedback, ideas, and support.	Employees don't have to wait for approval of managers. Action can be taken quickly.
Cultural disposition to share information and cooperate in finding solutions.	Peers will pitch in to solve a problem, even if they don't directly benefit.

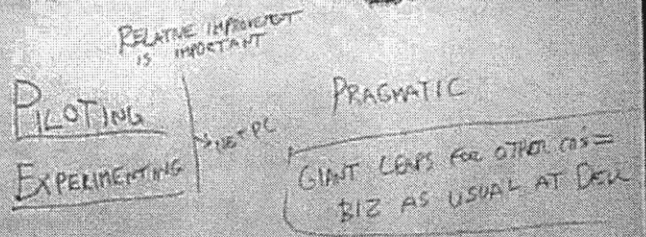OPEN OFFICE ENVIRONMENT

Focus Group 2 -- Idea 6, Part 2

Focus Group 2 -- Idea 7

Focus Group 2 -- Idea 8

Only Time for the Exceptions

Dell's rapidly changing markets and customer demands continually produce new and exceptional situations that need to be addressed. This constant stream of new challenges leaves no time for managers to micromanage or constantly monitor the "normal" actions of the people, processes, and systems that produce Dell's products.

Usually, managers only have time to pay attention to the exceptions, trouble spots, and anomalies that naturally arise from the changing business environment. To do this effectively, they create processes to quickly highlight problems and they trust in their rapid-response teams to correct them.

GOOD

ISSUE OF PRIORITIZATION, CAN'T GO AFTER EVERYTHING.

NH - THINK STRATEGICALLY, ACT TACTICALLY

CARS, SUSPENSION, BUMPS ANALOGY.

Focus Group 2 -- Idea 9

METRICS MOST IMPORTANT

Points of Stability Enable Flexibility

Most aspects of Dell's Operations are in a constant state of change. These include:

- Day-to-day work schedules
- Order requirements/demand
- Job or projects assignments
- Organizational structure
- Product mix
- Production and administrative processes

NEW DEFINITION OF CHANGE
IS "CHANGE" EVEN THE RIGHT WORD?
"WE'RE CHANGED CHANGE"
"IT'S A LIQUID"
"FLUID"

In order for people to be productive in this rapidly changing environment, four solid "points of stability" have emerged that seem to be essential for the functioning of Dell's Operations. These are:
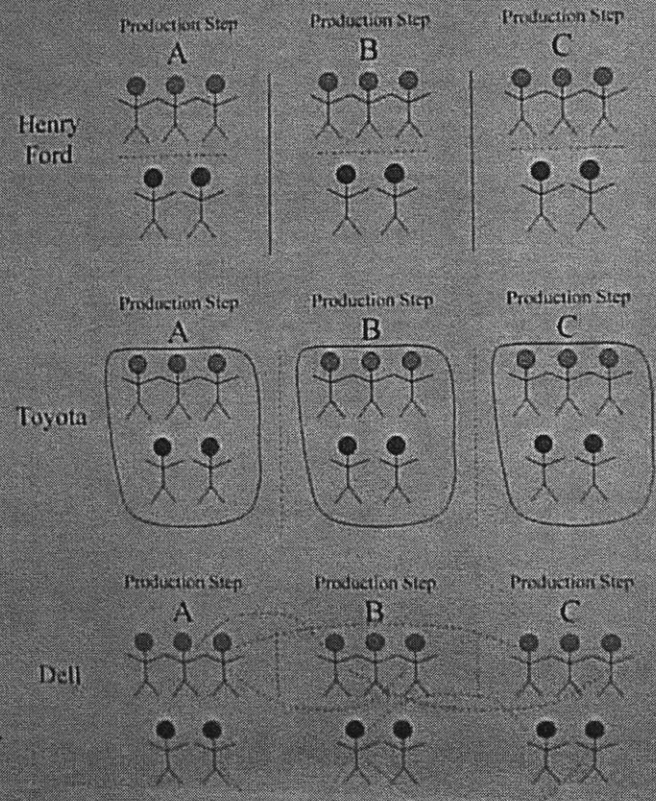
- Simple metrics.
- Strong leadership
- Individual accountability
- Alignment through frequent, widely attended meetings and access to real time information (usually through IT tools).

• RELATIONSHIPS ?

Focus Group 2 -- Idea 10

The Pulse of Dell's Operations

Dell's Operations support the rapidly changing needs of customers (i.e. the Direct Model) because our "pulse" is faster than that of any other company. The pulse of Dell's Operations is hourly, whereas at other companies it may be once a shift, once a day, or even once a week.

An "hourly pulse" means that this is the rate at which information flows and decisions are made. Examples:

- Hourly production reports sent via pagers to management in AFC/NFC
- Hourly production numbers are communicated in EMF
- Builders get individual feedback on their build rate hourly.
- "Aging" of systems in EMR are tracked on an hourly basis.

(handwritten: HSI   MAYBE EVEN FASTER?)

Focus Group 2 -- Idea 11

Simple Metrics Support Flexibility Because They Provide a Solid "Bearing Point" for Action

(handwritten: SPECIFIC?)

At Dell, there are times during projects when the exact process or the right solution may be ambiguous. There will also be times when plans need to change because of changes in the external business environment or because better ideas are discovered. During these times of change, Dell Operations' simple metrics provide a source of stability that allows projects to move forward.

Successful metrics at Dell have some or all of the following characteristics:

- They Should Be Simple and Scalable
- They Should Be Closely Related to the Customer Experience
- There Should Be a Limited Number of "Most Important" Metrics — *(handwritten: ADDITIONAL STATEMENT)*

(handwritten: — DATA DRIVEN COMPANY)

Focus Group 3 -- Idea 5

Focus Group 3 -- Idea 6a

Focus Group 3 -- Idea 6b

Dell's Processes and Systems Succeed Because of a Balanced Approach to Process Design and Process Technology Selection

In the area of process design and process technology selection, Dell always balances the three key attributes of Velocity, Productivity, and Flexibility.

QUALITY ?

Velocity
(Lower Inventory)

DIFFERENT ONES USED IN LOGISTICS

ARTICULATE THIS MORE.

Productivity
(Space & People)

Flexibility

These three criteria for selecting process technology can be thought of as supporting the overall Fulfillment goals of Cost, Quality, and Delivery.

L
P   G
C
← Financial Goals

Q   D
← Fulfillment Goals

V
P   F
← Process Goals
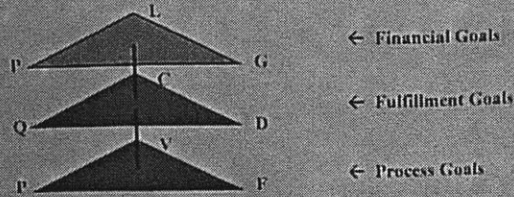
— LIMITED PLANNING → MAKE IT HAPPEN

Focus Group 3 -- Idea 8

Points of Stability Enable Flexibility

Most aspects of Dell's Operations are in a constant state of change. These include:

- Day-to-day work schedules
- Order requirements
- Job or projects assignments
- Organizational Structure
- Product mix
- Production and Administrative Processes

In order for people to be productive in this rapidly changing environment, four solid "points of stability" have emerged that seem to be essential for the functioning of Dell's Operations. These are:

- Simple Metrics / DRIVE FOR RESULTS
- Strong Leadership
- Individual Accountability
- Personal Relationships (i.e. A Social Network)
- DIRECT MODEL
- EXECUTION ORIENTED / MANIACALLY FOCUSED ON EXECUTION

FLEXIBILITY THROUGH TEAMS

Focus Group 3 -- Idea 10

The Pulse of Dell's Operations

Dell's Operations Support the rapidly changing needs of customers (i.e. the Direct Model) because its "pulse" is faster than that of any other company. The pulse of Dell is hourly, whereas at other companies it may be once a shift, once a day, or even once a week.

An "hourly pulse" means that this is the rate at which information flows and decisions are made. Examples:

- Hourly production reports sent via pagers to management in AFC/NFC
- Hourly production numbers are communicated in EMF
- Builders get individual feedback on their build rate hourly.
- DSI2 updates suppliers' scorecards hourly.
- In EMF, "Aging" of systems in EMR is tracked on an hourly basis.

- REPLENISHMENT
- FP - SCHEDULE - 2 HOUR

MANAGE DOWN IN ORGANIZATION

- DRIVE TO REDUCE COST

- NO PATIENCE FOR FAILURE
- FINANCIAL MODEL

Focus Group 3 -- Idea 11

DISTRIBUTED Leadership

LEADERSHIP AT LOWER LEVELS (INDIVIDUAL CONTRIBUTORS)

Dell's Operations moves so rapidly, that there is hardly any difference between management and leadership. Every manager is a leader at Dell. NEEDS TO BE

In this environment, the nature of leadership is different than at other companies. Leadership is not like the general in a war effort, leading the troops to a one-time victory. Instead, it is more like the captain of a ship on a very long voyage. As such, Dell's leaders are more a source of stability in their organizations than an agent of "change".

Effective Leaders in Dell's Operations know when to give freedom and autonomy and when to get involved in the minute details of a problem.

When to Give Freedom and Autonomy
For long-term goals and the normal day-to-day management, managers give their reports a high level of autonomy and independence. As long as goals are being met and product is being delivered, managers are little concerned with exactly how the work is done. ?

When to Dive into the Details
When there are problems, however, managers at Dell's Operations are ready and able to dive into the details of the problem to correct it rapidly. Furthermore, they are expected to do so by their managers.

- STRATEGICALLY ALIGN
- RESULTS ORIENT
- MOTIVATE

12 MONTH HORIZON MAX
80% WITHIN 12 WEEK HORIZON

RELATED IDEA

LEADERSHIP EXPECTATION

✓ DOES NO DEFINE LEADERSHIP AT DELL TOO WELL

Focus Group 3 -- Idea 12

Changing the Nature of Change

Although Dell's Operations employees have different titles and roles, the one thing they have in common is that they are always experimenting with new solutions to problems. In Dell's rapidly evolving environment, everyone knows that it is more important to experiment (and possibly fail) than to exhaustively study an issue.

This "experimentation" is not just restricted to process improvements. It also occurs in the areas of organization (e.g. individual roles and responsibilities and organizational structures).

There is so much experimentation and improvement activity at Dell, that it is impossible to ever define a "steady state", either in terms of processes or the organization. Therefore, the word "change", which implies moving from one steady state to another, doesn't seem to apply at Dell. In a way, Dell's Operations are beyond change—they are just continuously evolving and adapting as fast as possible to the changing conditions of its markets.

GOOD SUMMARY

LEARNING DEFICIT — TRIBAL KNOWLEDGE ONLY

Focus Group 3 -- Idea 13

Appendix 5: Sample of Comments from the Final Review of the Model

Level in the Organization	Comment
Senior Manager	I read the document. I should also note that I used part of it (from our discussion last week) in the presentation I made to the customer. I shared the Dell culture with them, using some specific attributes you raised like personal accountability and close personal relationships. The document reads well, and feels plausible. As we discussed, I wonder if we are too "seat of the pants", or as you write - appropriately flexible for a young organization in a more fast paced industry. You also note that we have core principles, but fewer detailed operating norms.
Senior Manager	Sorry it took me a while to get back to you. Overall it is good as a white paper to describe your findings. The data is accurate and should confirm/document what many of us see daily. I don't know that I would describe it as compelling. Maybe in an academic sense it is exciting because you can boil a complex issue down to explain it more clearly.
Manager	I totally disagree with the notion of frequent job rotation being an important practice that contributes to the Dell operating model. While I agree with the premise that understanding how the whole system works is an advantage, I don't think that has been a factor at Dell. If anything it has been a negative in the past two years with so much movement that we have too many new people in positions that we don't have the depth of knowledge in key functional areas, especially engineering. I agree that the informal network is key, but not sure how to interpret the personal relationship piece of that. The common information from regular meetings is also key. Having a few simple metrics that everyone knows and that everyone is measured against is probably the most important in keeping people aligned.
Director	Thought the information was an accurate assessment of our "operational culture." We should acknowledge it reflects our beliefs but sometimes we aspire rather than flawlessly execute (we aren't perfect!!)
Manager	I have read the document and believe it to be accurate. I do not have any comments to add. I believe that it reflects well how Dell and its people operate.
Director	Read it and I like it. I recognize it and its compelling for me. Already using it in some of my talks. I like the Cultural beliefs but would suggest you add something re our process improvement....Better over Best mentality.
Supervisor	Excellent synopsis of our "Operating Model............Never Satisfied, Always Evolving.........think I used this in my next Bi Weekly Comms session. Great view of the MFG Bigger picture......I can only look forward to your final draft. I especially liked the paragraph reg: Leadership at all levels and Obsession with Execution.
Director	I did read it again to day and I also copied my staff with the original mail for additional comments and basically I have no issue with the contents

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