DECISION MAKING THROUGH TOOLS FOR BUSINESS USERS AND POWER USERS

by

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Decision Making through Tools for Business Users and Power Users

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ABSTRACT

Crystal Decisions is part of the Business Intelligence industry and has been achieving over 30% revenue growth for the last four years. There are many products in their portfolio targeting many different users' needs to make intelligent decisions. A major issue is that the market is not aware that Crystal Decisions has this breadth of tools.

For companies like Crystal Decisions to continue to grow at an increasing rate, it is essential that they take in to account the needs of users that spend a large amount of their time analyzing or using information. The influential information producers, "power users" and a large segment of "business users" such as executives, sales, and marketers, who make a large number of decisions, are particularly important. Power users are people within organizations who spend 84% of their time producing data/analysis and comprise approximately 5% of the workforce in their organization. Examples of job titles this group would hold are data analyst or information specialist and can reside within the finance or marketing department. One of their main challenges is that they have a lot of information that they can share with people, but they do not have an effective way to do so. Business users are approximately 30% of the organization and rely on power users to provide the information they need to allow them to explore and modify their analysis and make decisions. To meet the needs of these two groups, careful consideration needs to be taken as to how they currently aid decision-making.

The question of this paper is:

How can companies, like Crystal Decisions, expand their market share and adoption within companies and target and meet the requirements of those users whose need for software programs in decision making are not currently addressed?

The goals of this paper:

- Analyse how power users and business users, a market that Crystal Decisions does not target, make decisions using various software tools

- Recognize areas of opportunity for enhancements in the technology of the Crystal Decisions Product Suite

- Identify potential in-market management strategies to ensure adoption of these technologies

Crystal Decisions needs to target and gain mindshare with the business users and power users to be competitive in the information market. These two groups need two different versions of a tool to make decisions. Business users need tools that will help them visualize their business and power users need an in-depth analysis tool that allows them to conduct in-depth analysis and include findings as part of the business process.

To ensure adoption of tools and ubiquity throughout the organization, releasing Crystal Decisions technology to the market for business users should be included and distributed in packages with other common business productivity software programs.

DEDICATION

This is dedicated to Bill, who without his support, I would never have completed this program.

ACKNOWLEDGMENTS

TABLE OF CONTENTS

LIST OF TABLES

TABLE OF FIGURES

1 INTRODUCTION

Crystal Decisions was founded in 1984 and began developing Windows based reporting software to provide decision-makers with accurate information when making decisions. Founded in Vancouver, Canada, headquarters are now based in Palo Alto, California with over 25 offices and 1750 employees around the world. Crystal Decisions has 16 million licenses shipped worldwide and annual revenues of over $287 million USD, which is a 30% increase over last year.[1] To date, Crystal Decisions has been focusing its product strategy on providing robust reporting to information consumers throughout the organization.

As written by Rick Sherman from Peanuts to Profits, millions of dollars have been invested in enterprise resource planning (ERP), customer relationship management (CRM), and supply chain management. In the past ten years, large budgets and strategic focuses of companies have been focused around preparing for the Year 2000 to guarantee their information technology (IT) systems keep their data secure and protected. As a consequence of this reactionary approach, companies now need to have ways to extract the data from their systems to achieve a return on investment and to make it useful for their users to make intelligent decisions. As Bill Gates wrote: "We are moving towards an age in which organizations will be measured and valued not in terms of their historical track records, but in terms of how they exploit the knowledge, intellectual property, and information invested in them" (Foss, 1990).

For organizations to be valued in terms of exploiting knowledge and information invested in them, people need to have timely access to the information required to make decisions. For

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[1] www.crystaldecisions.com/aboutus (July 2, 2003)

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Crystal Decisions to be in a position to take advantage of the type of future described by Bill Gates it must focus on those users and influencers currently not targeted as part of Crystal Decisions existing product suite. These users are business users and power users. They are the primary users and heavily influence the purchasing of tools and adoption.

Apart from the Information Technology (IT) department, business users and power users are the individuals within the organization who spend the largest percent of their work time with Business Intelligence solutions.

Business users are defined as those individuals within a business unit who must improve the results of a business process "along one or more dimensions." These people hold titles such as marketing manager, vice-president of sales, or product manager. They make decisions on a regular basis and power users help facilitate the decision making process. Business users face challenges getting access to accurate information and power users need to identify areas of opportunity for increased revenue (Kohavi, 2002).

Power users are producers of information. They reside within different business units and analyze large amounts of data and package it for distribution to business users to make decisions from. The professional titles of these individuals include data analyst, manager of analytics, and information specialists.

All companies use tools, whether computer-based or not, and they can be implemented within different parts of the decision making process (Smith, 1998). Organizations want to be proactive and therefore, when using analysis tools, they want tools that will eliminate surprises and be provided with facts that enable issue detection and definition to capitalize on revenue.

Companies that do not use any tools find that there are many challenges with human decision-making.

To address the question of how companies, like Crystal Decisions, can expand their market share and adoption within the Business Intelligence market and target and meet the requirements of those users whose need for software programs in decision making are not currently addressed, this paper is structured as follows: Chapter 1 provides an overview of the Information Technology and Business Intelligence market. I demonstrate the challenges that Information Technology departments currently face in providing the right information to the right people. I also describe the background of the Business Intelligence market to provide context around the opportunity for growth and expansion. Chapter 2 reviews Crystal Decisions, its history and how it has been successful to date. I introduce Crystal Decisions' product suite and target customers, and the competition it currently faces to help understand a typical company in this market. Chapter 3 describes the information needs of some users, provides a topology of power users and business users that most Business Intelligence companies, particularly Crystal Decisions, has not addressed with its product line. Chapter 4 discusses why organizations implement business intelligence tools and what business problems they currently solve.

Chapters 5 and 6 focus on decision-making, and how users adopt tools as a part of their day-to-day job responsibilities. These chapters help provide guidance as where tools are used to aid decision-making and how adoption of these tools occur to ensure product loyalty. Chapter 5 addresses the anatomy and process of making a decision, who the decision makers are within the organization, and what Crystal Decisions' involvement is within the decision making process. Chapter 6 provides an overview of the different attributes that may affect end user adoption of tools.

Chapter 7 delivers recommendations for companies, such as Crystal Decisions, for their

go-to-market and product development strategy to ensure they address the needs of a new user

group. Chapter 8 provides a final conclusion that describes a focused approach that Crystal

Decisions can execute from both the technology and go-to-market strategy perspectives.

1.1 The Current IT Environment

For the past 5 years, companies have invested heavily in IT to remain competitive; this is due to factors such as the anticipation of the Year 2000 and the economic downturn in the market. As the markets over this time were moving so quickly, companies made large investment decisions without considering the long-term impact on their organization (Sherman, 2003).

Companies have invested significantly in software but only 25-30% of the licenses are being used. This is due to the fact that many users have challenges utilizing the technical nature of the software and feel less productive than completing the task on their own.

1.2 Business Intelligence Market

Business Intelligence (BI) is a "broad category of applications and technologies for gathering, storing, analyzing, and providing access to data to help enterprise users make better business decisions. BI applications include the activities of decision support systems, query and reporting, online analytical processing (OLAP), statistical analysis, forecasting, and data mining."[2]

The BI Market, which Crystal Decisions is apart of, revenue reached $3.7 billion in 2002 (1.7% growth from 2002) and is forecast to reach $4.5 billion in 2007, a compound annual growth rate of 4.1% (Vesset, 2003). This BI Market is comprised of end user query, reporting and analysis tools, data mining tools, and packaged data mart/warehouse tools. Within this large

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[2] www.searchcrm.com (July 16, 2003)

market, end user query, reporting and analysis tools are where the majority of Crystal Decisions products reside. These tools make up more than 50% of the revenues for the BI market and are defined as tools that "include query and reporting tools and multidimensional analysis tools"[3]

The end user query, reporting, and analysis tools market is comprised of a number of technologies. The technologies that comprise this market range from being inexpensive and designed for mass consumption to others that are complex in nature and intended for use by a narrow set of users with highly specialized skills. Crystal Decisions develops products that reside in most of the categories below and for the past four years, has focused on the reporting and information delivery categories.

1.2.1   *Query & Analysis Tools*

Query and analysis tools are used to filter and organize large amounts of data into meaningful packages or views of information. These packages allow further dynamic interaction of information to help answer business questions. Specific technologies include online analytic processing (OLAP), ad hoc query, statistical analysis and data mining. These are tools that are usually targeted towards power and business users as they enable interactivity and exploring within data and allow power users to brief others on their findings.

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[3] team.crystaldecisions.com/topgun/pre-work (June 20, 2003)

1.2.2   *Reporting Tools*

For presenting information to diverse business users, it is usually important to incorporate high levels of data formatting, charting and interactivity to help with effective decision-making. Reporting tools can be capable of accessing relational and multidimensional data. Reporting is usually provided to the least sophisticated user, usually an information consumer who needs an answer to a specific question.

1.2.3   *Enterprise Reporting/Information Delivery*

Enterprise reporting includes web-based infrastructure technology for managing the access, organization, processing and secure delivery of interactive information to employees, customers and suppliers. This solution allows the efficient distribution to people inside and outside the organization in many different types of mediums (e.g. Microsoft Excel, PDF). The combination of reporting and information delivery enables a low cost per user ratio.

1.2.4   *Analytic Applications*

Analytic applications are a technology for building and managing automated models for specific business and functional analysis. Typically it involves large amounts of complex, integrated data; applications include budgeting, key performance indicator (KPI) monitoring, sales force management and Balanced Scorecard. These are usually highly intensive implementations, as they need consulting, and changes the way a company operates. Crystal

Decisions has analytic applications as part of their product portfolio; however, they are only used as showcase demonstrations of the product suite.

1.3 Conclusion

The BI market has been growing at a rate of 1.7% over the past year while Crystal Decisions has achieved over 30% growth per year for the past four years[4]. Crystal Decisions resides within the end user query, reporting and analysis market and has achieved this top performance by focusing on robust reporting and providing information to consumers. This market contains a number of sub-groups of which end user query, reporting, and analysis accounts for approximately 50% of the revenue and is a large opportunity.

Crystal Decisions has not focused on business users and power users who need information to facilitate the decision making process and who make up approximately 30% of the end users within the enterprise. Business users are those individuals who need to improve the results of their business unit and review their metrics on a regular basis (e.g. a marketing manager with a campaign he/she is running). Power users are the producers of information, such as a data analyst, and must analyze large amounts of data and package it to enable business users to make decisions.

Power users and business users have challenges with ensuring their information needs are met. Most organizations only utilize 25-30% of purchased software licenses within their

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[4] www.crystaldecisions.com/aboutus (July 2, 2003)

organization. This low adoption rate is due to users finding the tools too difficult to use, and thus less productive than completing the analysis on their own.

An objective of this paper is to determine the needs and characteristics of business users and power users. This paper investigates how these users make business performance decisions through the use of tools. I also discuss the process of adoption and determine what barriers there are to adoption of technology and how Crystal Decisions can further its product capabilities to maintain differentiators to compete effectively against market rivals.

2 CRYSTAL DECISIONS: THE COMPANY

2.1 Chapter Overview

Crystal Decisions has substantially increased its revenue growth beyond the average growth of 2% that other vendors have attained, and has achieved the closest progress to what Gartner Group, a technology analyst group, calls the "New Enterprise Business Intelligence Suite" (Dresner, 2002).

This chapter will explain the history and background of Crystal Decisions, the performance of the product suite to date as well as the product line it now carries. I will give the theoretical background of past strategies of Crystal Decisions and end the chapter with an overview of the competitors in the business intelligence market.

2.2 History

Crystal Decisions has formed multiple alliances and acquired many companies that have led to the above average growth of this company over the past 4 years. It was founded in 1984 and delivered its first commercial product to the market in 1992 called Crystal Reports[5]. Crystal Reports enables customers to integrate reporting into their applications. Within a year, Crystal Decisions signed a strategic alliance with Microsoft and increased market penetration in the box of Visual Basic, Microsoft's programming language for software developers. Crystal Reports is

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[5] www.crystaldecisions.com/aboutus (July 2, 2003)

now the world's leading report writer and focuses on system lock-in with organizations and trying to upgrade customers to its Enterprise product suite.

In 1996, Crystal Decisions released an information delivery mechanism for Crystal Reports and acquired an analytics company called Holistic Systems to expand product capabilities. This expansion was deemed necessary to allow users to analyze their data more effectively. Much of the company's focus for the past 19 years has been around seeding the market and building a robust and reliable reporting system that would provide users with highly formatted reporting through Crystal Reports. Due to the strong history and branding with Crystal Reports, Crystal Decisions has been seen as a desktop report writer and not an enterprise software vendor.

Since Crystal Decisions was founded in 1984, the focus of their product family has been on enterprise reporting and integrating reporting into other 3rd party IT application software. The sales force of Crystal Decisions is currently focused on driving the purchase decision through a customer's IT department and focusing on the mass consumption of reports for information consumers; not determining the needs of power users and business users.

In the past two years, Crystal Decisions has moved to be seen as more of an enterprise player due mostly to the penetration of its information delivery infrastructure being sold into companies to deliver their Crystal Reports. This focus and awareness has primarily been with developers and IT because these groups have used the products and provided information to other users but did not allow any modification of the analyses created. Crystal Decisions has been extending its product line to focus more on interactive analysis for business users and power users. Examples of these products are Crystal Analysis and Ad hoc in Crystal Enterprise.

There is minimal awareness of these tools in the market. These products help address the needs of the key users who influence the purchase decisions for tools aiding business productivity. Therefore, it is crucial to understand the characteristics and needs of these users for Crystal Decisions to develop the appropriate tools.

2.3 Crystal Decisions Products

The Crystal Decisions product line includes 4 product families:

Crystal Enterprise:

Crystal Enterprise provides a platform and infrastructure to deliver reporting to help companies make better use of corporate data. Both Crystal Reports and Crystal Analysis use this product as a way to distribute reports and analysis.

Crystal Reports:

Crystal Reports is a productivity reporting technology for rapidly transforming almost any data into formatted reports for access via popular environments including portals, wireless devices and Microsoft Office documents.

Crystal Analysis:

Crystal Analysis is an analysis solution that provides guided analysis enabling employees, customers and suppliers to explore and view patterns and trends in their data.

Crystal Applications:

One of the areas of the Crystal Decisions product line that has not had much attention is the Crystal Applications product family. These products are mostly showcase demonstrations of

Crystal Decisions' products focused on specific business issues. There are a few commercial applications that Crystal Decisions sells such as the KPI Scorecard.

2.4 Focus of Product Strategy

As described earlier, the majority of Crystal Decisions' revenue comes from the Crystal Reports and Crystal Enterprise product lines. The focus is on these two products because Crystal Decisions believes that that around 95% of the market needs reporting and focusing on this market is a competitive differentiator[6]. As Michael Porter wrote, there are many forces governing competition in an industry: bargaining power of customers, bargaining power of suppliers, threat of substitute products/services, threat of new entrants, and jockeying for position among current competitors. This intense rivalry moulds the product strategy that Crystal Decisions uses due to a couple of factors listed by Michael Porter (Porter, 1979):

- **Industry growth is slow and there is aggressive rivalry for market share.** As listed above, the current projected industry growth for 2004 is only 1.7%. Any significant growth of revenue will come from both taking market share from competitors, and capturing new growth in the overall market.

- **Rivals are diverse in strategies, origins and personalities.** Both Business Objects and Cognos, rival competitors of Crystal Decisions, have focused their product strategy on empowering and meeting the needs of end users and selling large enterprise deployments. Crystal Decisions has focused on mass delivery of reports through Crystal Enterprise and Crystal Reports and seeding the market through its partner relationships with Crystal Reports. Harvesting with the inside sales representatives and getting an organization to lock-

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[6] www.team.crystaldecisions.com/topgun/pre-work (July 2, 2003)

in through their relationships with System Integrators and direct field sales force are strategies Crystal Decisions also use.

To compete with Business Objects and Cognos, Crystal Decisions also has other products in its portfolio. Despite the purchase of Holistic systems in 1996, the Crystal Analysis product family (which includes products such as Holos and Crystal Analysis Professional) has become a stronger focus for Crystal Decisions in the past two and half years. These analytical tools are attractive to decision makers who need to make thorough corporate performance decisions because of the ability to investigate their key metrics.

This new focus has led Crystal Decisions to being the closest to what the technology analyst, Gartner Group calls a 'New Enterprise Business Intelligence Suite.' As Gartner Group states: "One of the hallmarks of 2003 will be the drive to do more with less. Enterprises will seek to reduce BI tool proliferation and get more out of the products they have or those they are thinking of buying. Enterprise BI suite (EBIS) convergence will often be an enabler to standardize on a single BI tool."(Dresner, 2002).

This New Enterprise Business Intelligence Suite, the 'convergence' of robust reporting and Enterprise Business Intelligence (analytics), enables customers to reduce the number of vendors that they use for information delivery and ensures a seamless end user experience whether it is through static information or an ad hoc query. Crystal Decisions is seen as a leader in this race and believes that it is critical for organizations to concentrate on a scalable and reliable infrastructure. Crystal Decisions also believes that layering on analytics is the best way to complete a converged solution. Competitors are also seeing the value of ensuring they have this complete solution.

2.5 Theoretical Background on the Strategy of Crystal Decisions

One of the key go-to-market strategies for Crystal Decisions is to achieve system lock-in with customers. Therefore, Porter's work on strategy, and the creation of his Five Forces (Porter, 1998) model, is important as a consideration for Crystal Decisions product strategy moving forward. From this, a conclusion is to be made to follow the classic strategies of cost based competition or differentiation-based competition. In contrast to Porter, Hax and Wilde (Porter, 1998) describe three broad strategic options that they term the Delta Model. These options include:

- o Customer solutions – competing based on economics of the customer, reducing costs or increasing profits
- o Best product – competing on cost or feature differentiation
- o System Lock-in – competing based on market economics. The focus is on complementor lock-in, competitor lock-out and the establishment of proprietary standards (Hax & Wilde, 1999).

Crystal Decisions is currently aiming towards gaining system lock-in with their customers by seeding and trying to sell with System Integrators into Fortune 500 companies and increasing complementor lock-in and locking out the competition by being bundled in Microsoft products.

2.6 Competition

The Business Intelligence market is fragmented and is made up of multiple niche companies. It includes many competitors but only a few that are directly competitive with Crystal

Decisions. To be able to meet the needs of a broad range of end users, particularly power users and business users, it is important that Crystal Decisions achieves a balance with its product portfolio between different users. Currently, some of the direct competition of Crystal Decisions meets the needs of these users more effectively than Crystal Decisions.

Many competitors are working towards what Gartner calls the "New Enterprise Business Intelligence Suite". "New Enterprise Business Intelligence" is what customers are looking for to be able to standardize on one BI tool. It is important for Crystal Decisions to continue to keep a competitive differentiator and emphasize that they are the closest to this milestone and be seen as having the complete solution to meet a customer's information and analysis needs.

Crystal Decisions has two main competitors that focus primarily on high usability and empowerment of the end user, and not Robust Reporting and high output of reports like Crystal Decisions. However, with the new products the competitors have been and will be releasing over the next year (e.g. Business Objects Enterprise 6), robust reporting is an important focus for these companies. These competitors are important to this analysis because they provide some guidance as to where Crystal Decisions should be focusing the breadth of their product solutions. Cognos and Business Objects are currently number one with \$551M[7] USD and number two with \$454.7[8] respectively in revenue within the Business Intelligence market.

Cognos is a Canadian company based in Ottawa, Ontario. They are the producers of a wide range of tools for the BI market. They market Powerplay (OLAP/Analysis) and Impromptu

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[7] www.cognos.com (June 26, 2003)

[8] www.businessobjects.com (June 27, 2003)

(Query and Reporting) products together as an Enterprise Business Intelligence solution. The emphasis of their solution has been on OLAP and Analysis, which is targeted mostly at power users and also some business users. This company not only markets the front-end analysis tools but they also have an OLAP server where customers can store their information that has been shaped in a customized way to ensure quick and effective analysis.

Business Objects originated in Paris, France, and markets its solution heavily to end-users and promotes ease of use and empowerment for those conducting analysis. This empowerment is assisted through a technology called meta-data, which allows end users to access data that has been abstracted from the production system and modelled in a way that makes sense to the business.

Cognos and Business Objects focus on Enterprise Business Intelligence technologies. The attributes of these technologies are high usability, semantic layer, OLAP viewing, highly interactive, and user-centric (Dresner, 2002) that really focus on the needs of the users of information. In the past, Crystal Decisions, who has been ahead of the competition in achieving the new EBI suite, has focused on robust reporting which includes attributes such as sophisticated formatting, multiple output types, batch oriented, publishing/distribution of information, high scalability, and high output.

This competitive analysis demonstrates that Crystal Decisions has strength with Information Consumers and the IT department, while the direct competition is focusing on business users and power users and has achieved the number one and number two position in the market with regard to revenue as a result. If Crystal Decisions focuses on these users and their

exact needs for functionality with tools to help them make decisions there is an opportunity for increasing market share within the Business Intelligence market.

To continue as the leader in the EBIS market, Crystal Decisions must provide information in correlation with how people make decisions with the right level of seamless interactivity in a timely manner. It is important to minimize the amount of time it takes business users and power users to identify a problem and then take action. Crystal Decisions must have a solution that meets the needs of all users in the enterprise.

Awareness of Crystal Decisions meeting the needs of power users and business users in the Business Intelligence space will ensure more product adoption. Therefore, an effective go-to-market strategy is critical in addition to enhanced new products.

2.7 Conclusion

Crystal Decisions has a breadth of products that meet the needs of different users throughout the organization. Through bundling with Microsoft, they have achieved system lock-in with its Crystal Reports product. The combination of their focus on scalable distribution, robust reporting and entrance into the analytics tools market, has brought Crystal Decisions closest to what Gartner Group calls, the "new Enterprise Business Intelligence Suite."

With the movement towards the "new Enterprise Business Intelligence Suite", customers will be able to reduce BI proliferation and standardize on one tool. To make more progress towards this new converged Enterprise Business Intelligence, Crystal Decisions needs to focus on being more user-centric like its competition.

The BI market is fragmented but there are only a couple direct competitors that Crystal Decisions focuses on, Cognos and Business Objects. These two companies have revenues that are approximately 25% larger than Crystal Decisions but have been growing at a rate of approximately 10% as opposed to Crystal Decisions' growth rate of 30%. Cognos and Business Objects have been focusing on empowerment of end users, abstracting users from the data, and providing high interactivity and analysis. There is a large opportunity for Crystal Decisions to gain market share by concentrating on its strength in robust reporting and also expanding its focus to capture a larger segment of the end user (business user and power user) market.

Crystal Decisions currently has a few products that meet the needs of business users and power users. This analysis will make recommendations on how to focus on the needs of these two audiences with regards to decision making, and what recommendation should be made to increase market share to close the gap in revenue with the competition.

3 POWER USERS AND BUSINESS USERS

3.1 Chapter Overview

To understand how companies such as Crystal Decisions can start addressing the power user and business user market, it is important that I analyze who these user groups are and what their needs for information are. Chapter 3 explains how there is different information needs for user groups, who business users and power users are, and the challenges that they face.

Knowing who these user groups are and the challenges that they face are critical for a company like Crystal Decisions. This knowledge allows Crystal Decisions to specifically target a known segment and address the challenges that they face with a product that can be readily adopted and easily used.

3.2 Information Needs for Different Users

Many levels of Management need different types of information. A few examples of what different users need are:

- General Manager of a Line of Business needs to be alerted when the projected number of sales is down from what was planned.

- Vice-president of manufacturing uses supply chain management to determine inventory and capacity excess to ensure greater efficiency next quarter.

- Vice-president of marketing is alerted that the new TV campaign results are within 10% of the fiscal year plan.

Levels of interactivity needed are different depending on who the user is and the action

that needs to be taken. For tactical and strategic planning, actionable analysis can usually be

delivered such as an alert that "today's widget sales are 30% lower than forecast." For

operational decision-making, personalized alerts for business users can be created and delivered.

For example, an action message could be alerted to the business that widget sales are 30% lower

and operational message can be received to lower the price of widgets by 5 percent.

3.3 Power Users' and Business Users' Needs

Understanding and acting on corporate data requires the ability to delve deeply into

information to effectively understand trends, report and compare results, and deliver critical

information to business leaders and other decision-makers across the organization.

Business users and power users are the key users of information within the enterprise.

Business users are defined as those individuals within a business unit who must improve the

results of a business process "along one or more dimensions." These people hold titles such as

marketing manager, vice-president of sales, or product manager. The analysis of information by

business users is conducted in many areas of a business including "sales, marketing, and supply

chain and fraud detection" (Gurbaxani & Whang, 1991)[9]. In most cases, power users are

producers of information. They reside within different business units and analyze large amounts

of data and package it for distribution to others. Power users are not decision makers but they

facilitate the decision making process.

The chart on the following page illustrates the profiles of users within the organization and how much they interact with data and analysis. This diagram also shows a correlation of the user group that has a high percentage of producers of information that are not decision makers. This helps us understand who is providing information for others to make decisions and who is spending a large percentage of time with BI solutions and is a decision maker (e.g. business user) who should be marketed to in the future.

There are five profiles of people within an organization that consume information. Later in this paper, we will go into further depth to describe these user groups of users. IT is the Information Technology department that usually purchases the software tools and is usually responsible for providing data for the organization. Power users are also producers of information and they usually reside within a business unit and are responsible for providing business users with information to make decisions. Business users consume information. They may make some modifications to look for opportunities within the data that power users provide them, and they make decisions based on this information. Casual users are those users who may need to interact with the data but on a very limited basis. For example, they may need to choose a date so they are able to see information for this timeframe. Finally, extended-enterprise users are those people who are not interacting with information. They may be looking at a report on the Web and not making any modifications to it. Depending on the task at hand, a user, for example, could switch from being a casual user of reviewing their expense report over the Web, to being business user modifying information to make a business decision.

Constituency	% of All End Users	% That are Producers Data/Analysis	% That Are Consumers of Info	Decision-makers	% of Work Time Alloted to BI Solution
IT	2	98	2	No	15
Power User	5	84	16	No	42
Business User	25	18	82	Yes	12
Casual User	30	8	92	Yes	4
Extended - Enterprise User	38	3	97	Yes	2

Source: Created by author based on Keith Gile (2003): IT Must Differentiate Between Analytic End-User Producers and Consumers

Table 1: Profiles of Users and Analysis

3.4 Power Users

Power users are critical interpreters with 84% of them producing informative business data. This segments' number one responsibility is to make sense of data and provide insight to other users. Job titles of power users include: data analyst, project manager who is responsible for collating business user information, information specialist, report designer and many others. Power users conduct in-depth analysis and spend approximately 42% of their time with BI solutions. Power users are identified as people who have access to data that would support metrics. They usually have a mixture of business and technical knowledge.

3.5 Types of Power Users

There are many professional titles and three different types of power users within most organizations. They have different levels of interactivity with data and use different tools as part

of their jobs. The types of power users are: beginning power users who use a query tool like Microsoft Excel and make up 20% of power users; an intermediate power user including developers using an OLAP tool and is approximately 70% of the user base; advanced power users would be statisticians and use tools such as SPSS. Advanced power users make up 10% of power users (Gile, 2003). Crystal Decisions tools focus on the beginning and intermediate power users as part of their product strategy.

3.6 Challenges for Power Users

Decision-makers are reliant on power users to understand what is happening in the business – and why. Data accuracy and ensuring the information they receive is part of the business process is a top priority of power users (Kohavi, 2002). Their common responsibilities include:

- Understand the business process and key business metrics to be able to present information appropriately.

- Translate one-offs into readily consumable and re-usable information.

- Know the structure and location of the data.
    - Extract and interpret data.

- Creating and sharing information in highly usable and understandable way for   business users.

- Managing and analyzing large amounts of data to understand what's happening across the business.

- Correlate information to business events.

Power users need to manage the overwhelming demands for information and business intelligence. They also encounter other issues such as:

- Managing multiple information management silos to gain the corporate truth.

- Providing information in a presentation medium.

- Meeting the overwhelming and different demands for Business Intelligence.

- IT constraints.

- Lack of security of data.

- Answering ad hoc questions.

- Loose business definition when asked for information.

- Prioritization of issues from many demands.

3.7 Types of Business Users

Business users are those people that are responsible for improving profits and results within an aspect of the organization. This group could include executives, line of business managers, marketers, salespeople and many other people who need to improve performance around multiple metrics.

3.8 Challenges for Business Users

The gap between relevant analytics and critical needs of business users still remain significant. There are many business users that do not feel comfortable with BI applications. Most business intelligence tools that are in the market today have been developed to meet the needs of power users and are for quantitative analysts. Visual overviews of information are becoming more popular and data visualization helps simplify the recognition of exceptions, problems and opportunities. Business users want straightforward visualizations and task-relevant

outputs. As one of Crystal Decisions Healthcare customers said in an internal interview[10], "one of the most valuable areas for management to visualize is the complete patient."

The tool must improve the results that the business user is executing. It needs to be able to get to the detail and aid in finding out why something has been happening extraordinarily.

Business users need to:

- Be presented with trends, comparisons, key metrics, and exception-based information.

- Use data analyst's packaged information that is provided to them.

- Make decisions from trusted information.

- Feel in control of their business.

- Not be responsible for technology.

- Have the ability to massage information slightly to present and brief others.

In most cases, the business users are scared of technology and do not want to learn new tools. They have multiple challenges when using and analyzing information to improve business performance. For these users, there is a large gap between receiving the relevant information and their needs. The reasons for this gap are (Clemons, 1991):

Analysis is time consuming

Many business users are making decisions by bringing together their own data to verify their decisions. This process is long and laborious and also leads to inaccurate results and decision-making. More-specific pains include:

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[10].team.crystaldecisions.com/internalinterviews/power users (July 2, 2003)

26

- Access to the exact information is not available or takes too long to access.

- The data that they are provided with has no context and does not aid in the decision that has to be made.

- Business user does not have a view of what is happening across their business unit.

- Analysis has been built for quantitative analysis and can not be shared across the enterprise.

Difficulty in accessing rich information

Rich information is needed to make informed decisions. Usually when viewing this type of information, other technical users need to create a view of the business for the business user. More-specific pains include:

- Tools that they can access are built for people with more technical skills like power users.

- Need access to visual and task-relevant outputs of information.

- Packaged information that they receive from others is not relevant and/or usable in reviewing key metrics of the business unit.

- Business users have to wait until a power user/IT make slight modification of the views of their information.

- Business users are scared of technology and how to use it.

Analysis is disconnected from the business process

In most organizations, analysis currently occurs sporadically and is amalgamated only when metrics need to be delivered. To capitalize on opportunities at any time, it is important that analysis is part of the business workflow. More-specific pains include:

- Inability to identify why the exceptions have occurred easily within the data.

- Cannot share their findings with key stakeholders within the business.

- Need to re-create information to use in presentations and proposals.

3.9 Conclusion

Multiple groups throughout the organization use business intelligence tools to facilitate the decision making process. People are continuing to use tools that are familiar and will efficiently provide them with information to facilitate their decision making, thus minimizing time for analysis,. Despite the large investments that companies are making in BI, users are still using Microsoft Access and Microsoft Excel to formulate their budgets, collate their data and analyze their business performance information. The reason for the large use of Microsoft Excel in organizations is the ubiquity of this tool throughout the organization and the flexibility it provides to both power users and business users.

Power users and business users are two groups of people that together make up approximately 30% of the organization. Companies such as Crystal Decisions need to focus on providing tools to the actual users of information to be successful. Power users, (i.e. data analysts and information specialists), are the interpreters of business data and spend the majority of their time analyzing large amounts of data. Business users are individuals within the organization who are responsible for making decisions to improve profitability for their business unit or product line. They have job titles such as marketing manager, VP of sales and product managers.

Business users and power users have different challenges when trying to facilitate the decision-making process and these needs have to be taken into account when companies are

planning their product or go-to-market strategy. Power users need to understand the business process and present information in an accurate business context. Currently they have to make slight modifications of information in an efficient way to meet many business user requests. Business users find analysis consuming as they have to create their own information by compiling the data themselves in Microsoft Excel or Word (Sherman, 2003) or they have to wait for the power user, who has many requests from multiple users, to create the appropriate information. Business users also need rich views of information, as part of the business process, in a visual and task-oriented manner.

Even though not all users, like power users, make decisions, it is important to understand how the decision-making process works to ensure that the appropriate tools are available to assist these users. This will ensure the use of business intelligence tools is part of the business process to maintain efficiency and profitability. Business users are decision makers and need tools that empower them to minimize the time to conduct analysis. As seen above the needs of power users and business users are quite different and need tools that are targeted at their different needs. Crystal Decisions should use the analysis of the users above to determine how to expand their product line to correspond to the user groups' needs.

4 WHY DO ORGANIZATIONS IMPLEMENT BUSINESS INTELLIGENCE TOOLS?

4.1 Chapter Overview

This chapter will examine the role that data has in the decision making process. Now that I have discussed the Business Intelligence industry, the opportunities that exist with user groups Crystal Decisions is currently not addressing and what needs these user groups have as a foundation to our analysis, it is important to discuss the challenges of data within organization. I will explore some data issues faced by companies today and explain why enterprises should see business intelligence as an important initiative for decision-making. The chapter finishes up with a look at Gartner Group's BI Process of Enlightenment to help demonstrate how companies use BI to gain the most productivity and value from it.

By understanding why BI tools are used, we can then show who would use them, how the products may be used by that business user or power user, and determine which user to specifically target with marketing and product design.

4.2 Data and Decisions

Business Intelligence enables organizations to make sense of the large amount of data that they have within their organization. Data in multiple silos throughout the company is a continuous challenge that all users face. Data is a foundation of good decision-making.

Data is an essential input into most decisions. Business intelligence helps turn this data into actionable information. Data helps managers to understand what is happening within the enterprise. Most companies agree that data needs to be managed but few people effectively receive a return on investment from their data. However, data on its own does not provide organizations what they need to increase their revenue and capitalize on any opportunities.

The following are common data challenges that face companies and need to be taken into account to ensure information is usable for decision making: (Levitin & Redman, 1998)

Information and business strategy are not connected

Companies do not know which data is imperative to make business strategy decisions and when it is identified, the data is usually not available. A long-term plan for how to incorporate new sources of information is not part of their overall plan.

Knowledge of data available

The company does not know what data is available, where the data is coming from and how to transform it into useful information.

Access to information

People cannot get access to the data that they need and they are not permitted to use it because it is not being shared with the appropriate stakeholders. Therefore, people are using their own tools to estimate business performance. Crystal Decisions has the challenge of providing the right information with the right level of interactivity to all users throughout the organization. Crystal Decision's products currently only allow IT to send batch reports throughout the organization.

Quantity

The current data that is being used does not have relevance or value that can be attributed to the metrics being determined.

Quality

Data variables are inaccurate and do not provide correct metrics.

Usage

Decision making by individuals is not based on facts and opportunities are missed.

Security/Privacy

Data is at risk of being accessed by unauthorized users and could cause the information system to halt due to usage by uninformed employees.

Data challenges are important to this analysis as they have a downstream affect on power users and business users and the issues that they face.

Once these data challenges are addressed, it is important for organizations to understand why they should plan for business intelligence as the next step and why it should be an important initiative in decision-making and strategy within their company. Business intelligence from Gartner in May 2002 (Dresner, Buytendijk, Linden, Friedman, Strange, Knox & Camm, 2002) ensures:

- Having more insight into your market than your competitors do.

- Adapt quickly to market conditions.

- Creating new opportunities for revenue.

According to Gartner Group, BI is a process of "enlightenment" and value it adds to the business. The stages are (See Figure 1):

Making sense of the business – understanding what is actually occurring within the business day-to-day.

Driving the business – ensuring the way that the business is moving forward is efficient and profitable.

Optimizing key organizational relationships – enhancing the current business processes through optimizing relationships with key stakeholders inside and outside the organization.

Insight into the business – defining what new opportunities should be sought after to increase revenue.
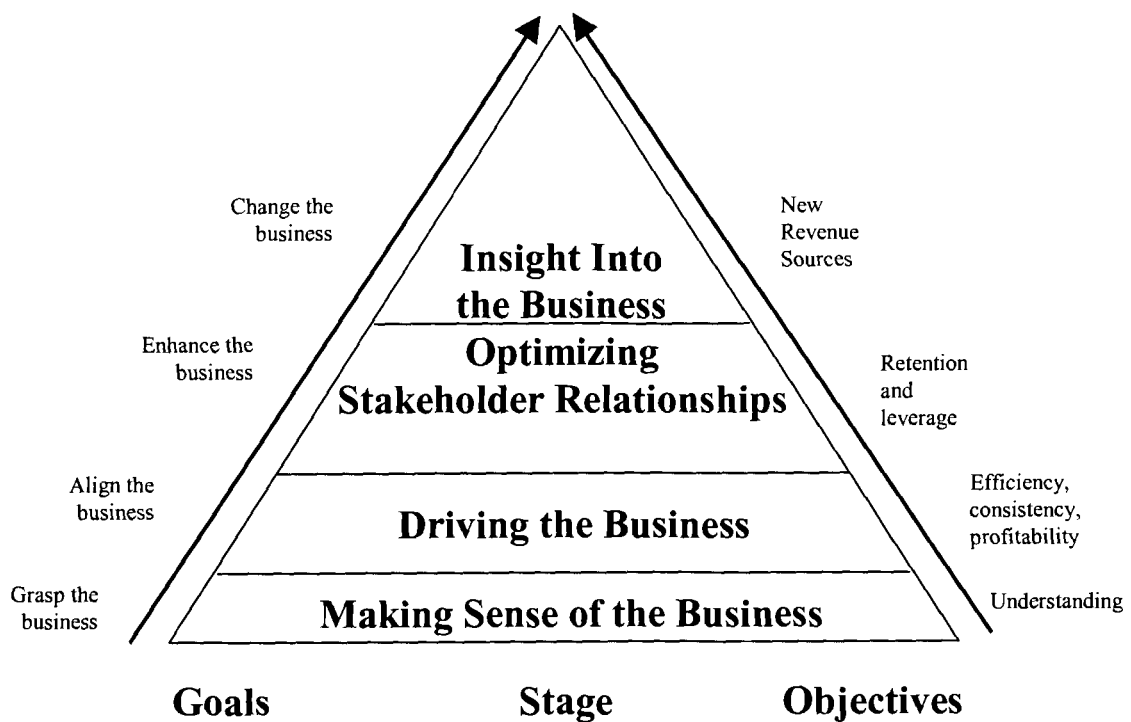
Source: Created by author based on Dresner (2002): The Business Intelligence Competency Center: The Process of Enlightenment

Figure 1: Gartner Group BI Process of Enlightenment

The figure and framework above demonstrates that once the spectrum of users have access to their data, to ensure a return on investment on data, business intelligence from companies like Crystal Decisions is critical to thoroughly understanding the business. This diagram demonstrates that as organizations spend more time with tools to make sense of their business, they can ultimately find new revenue sources and change the business. As you will see in upcoming chapters, there are multiple facets to decision making and business intelligence is key for users that need to make or aid decisions.

4.3 Conclusion

Organizations collect data within many of their operational systems, such as their CRM and ERP software, and need to extract this data to determine how to increase their revenues and minimize costs. In many cases, organizations have challenges with data and need a way to gain a return on investment on these systems. A lot of organizations do not know which data is imperative to the task at hand, what data is available, or how to access the information. They also have challenges with the quality, usage, and security of the data.

When data has been collected, business intelligence tools, from companies like Crystal Decisions, enable organizations to provide information on what data is important to make business decisions. However, it is important that the tools are available to the users that spend the most amount of time making or aiding decision-making. The goal of the process of enlightenment is to ultimately gain a "single version of the truth" and insight into the business. This will help to identify new opportunities for revenue through changing the business.

Going forward, Crystal Decisions should focus on providing knowledge of the data available and appropriate access of information for a wider spectrum of users within the customer's company.

5 DECISION MAKING

5.1 Chapter Overview

In my past analysis, I have determined that business intelligence companies that do not focus on people who aid or make decisions, like power users and business users, are not taking advantage of an opportunity for increased revenue in a slowly growing market. With the challenges that I have identified with organizations and their data, and the value of business intelligence to their organization, it is important to discuss how people make decisions. This discussion will help direct companies like Crystal Decisions when defining their new product strategy for this market. Chapter 5 concentrates on decisions and how they are made and who makes them. I start by defining decision making to give the foundation of what is needed to make a decision and then look at the types of decisions made in a company. I then explore the approaches to and process of making the decision. The 8 steps of Classical Decision Making are laid out. I identify who makes the decisions in the enterprise, where the effort is in the decision making process and the challenges of computer supported decision-making.

The chapter ends with a brief look at the challenge of human decision-making and what opportunity Crystal Decisions has and their fit within the process.

5.2 Definition of Decision Making

Decisions are trade-offs between alternatives. Making a good decision requires a clear understanding of the goals to be accomplished. The need for decision-making speed and accuracy enhances the decision maker's struggle of obtaining sufficient useful information on which to

base the decision within available time (Foss, 2002). Speed and accuracy are critical to ensure the information is usable within the organization. High quality information gleaned from good data loses its value if not presented or interpreted in a timely manner.

5.3 Types of Decisions

To ensure vendors provide business intelligence tools that are usable for decision makers within an organization, it is important to understand the anatomy of these decisions. There are three different types of decisions within an organization – from most to least important (McCarthy & Menicou, 2002). It is critical that all three of these decision types are addressed by a BI company's product portfolio. Crystal Decisions currently focuses on the operation decisions and some of the tactical decisions. Organizations like Crystal Decisions need to find ways to aid strategic and tactical decisions, as these types of decisions are deemed more important to the organization.

The three types of decisions are:

Strategic decisions – determines the overall direction of the company and are usually owned by executives or a senior line of business managers.

Tactical Decisions – short in duration, adaptive, and action-interaction realignments. Business users throughout the organization make these decisions.

Operational Decisions – day-to-day decisions that are executed by all levels of management throughout the organization and have a low level of importance.

High

Category II

Strategic
decisions

Tactical
decisions

Operational
decisions

Time of functional validity/
Level of importance

Low

Category 1
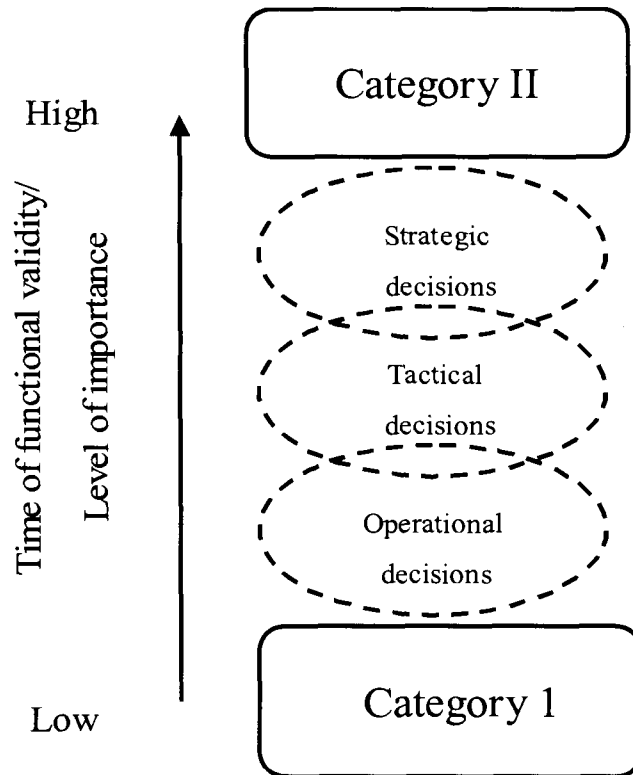
Source: Created by author based on McCarthy and Menicou (2002): A Classification Schema of Manufacturing Decisions

Figure 2: Types of Decisions

Decision makers make a different number of decisions depending on their level within the hierarchy of the organization. Executives have a lot of influence and make more long-term strategic decisions, middle management make decisions based on their direct business unit and Operations make tactical day to day decisions to ensure profitability. See Figure 3 (Foss, 1999). Business users make many of the strategic and business performance based decisions while power users, who mostly facilitate the process, make some of the tactical and operational based decisions. As listed in Table 1, power users are not significant decision makers within the organization. We will not focus on how power users make actual decisions, as their function is more to analyze large amounts of data and package it for users.

38

Strategic | Executives

Type of Decision

Middle Management

Tactical | Analysts

Operations

Number of decisions
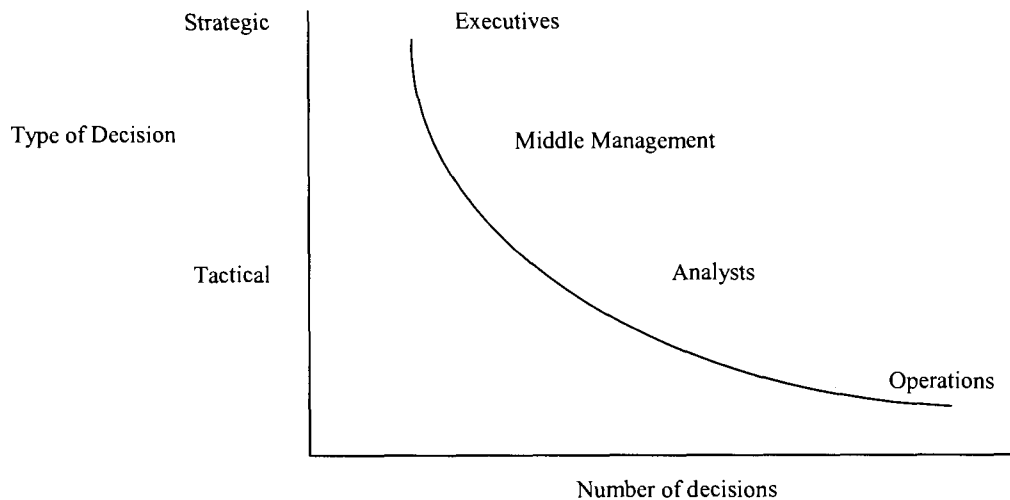
Source: Source: Created by author based on Foss (1999)

Figure 3: Decision Making and Hierarchy within the Organization

5.4 Approaches to Decision Making

The approach to decision making determines whether business intelligence tools can be used. There are many approaches to decision making including those from two extremes: guess and hope, and follow a decision making process (Foss, 1999). There are also hybrid approaches, a mixture of both using their own intuition and partially following a decision making process. A hybrid approach may include users implementing the tools they have to partially follow the decision making process and then make some estimations for decisions if they can not access the information they need. Here are some descriptions of the two extremes mentioned above:

1. Guess and hope

Users make decisions through guessing and hoping in a reactionary manner because of lack of information, and quick time to action.

2. Follow a decision making process

Users can also make decisions through integrating with strategic goals, determining the cause and effect of the alternatives that are being considered, and using this process to plan ahead. Usually when following a decision making process, business intelligence tools are used to validate the action plan and next steps.

5.5 Process of Making a Decision

Decision-making is the process of formulating a conclusion. According to McCarthy and Menicou, a decision can be "thought of as an action selected among alternatives." According to Ventana Research (Rogge, 2002), there are 8 steps to classical decision-making. They are (Figure 4):

1. Recognize the threat and opportunity of a specific event

2. Understand the factors between this threat and opportunity

3. Set goals and objectives

4. Devise solutions

5. Compare solutions

6. Decide on Action Plan

7. Execute Action Plan

8. Review Action Results

Within this process of making a decision, there are multiple areas where business intelligence may be used; comparing solutions and reviewing action plans are examples.

Classical Decision Making
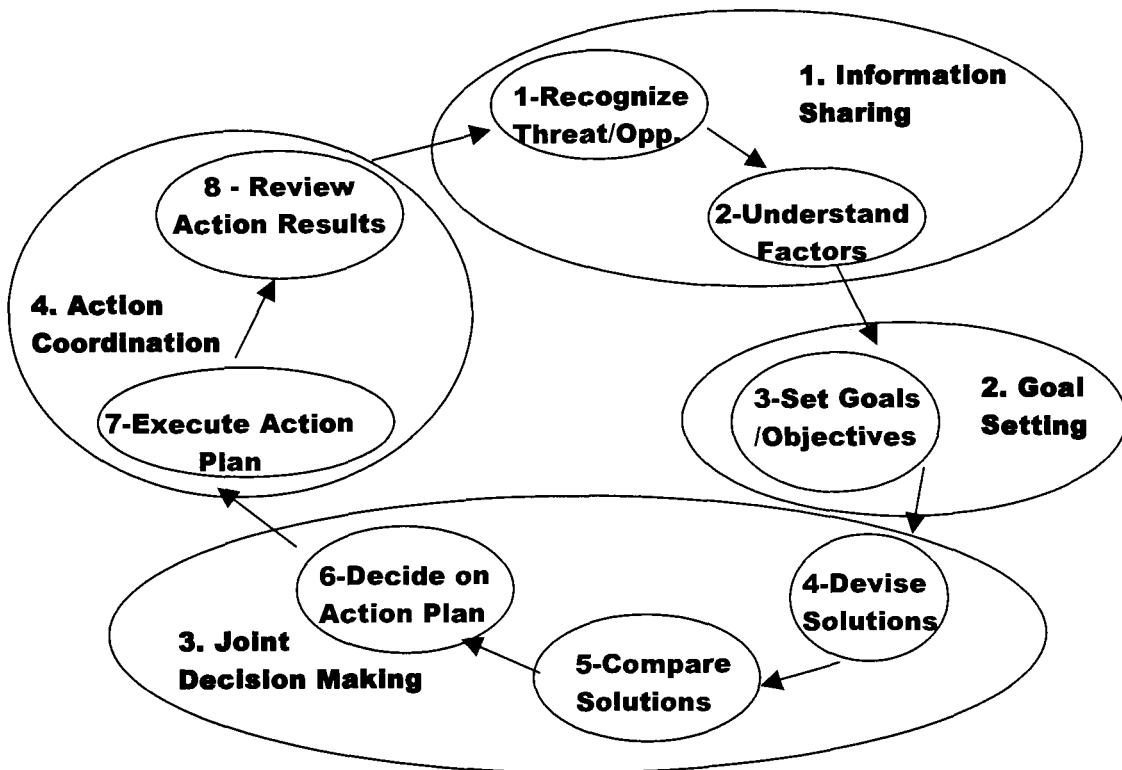
Figure 4: Classical Decision Making

Power users enable business users to initiate the decision making process and identify and recognize areas of threat and opportunity through such means as business intelligence tools. In an efficient decision making process, power users also support the decision making process by providing information when required along the eight steps listed above. Power users focus on the first stage "Information Sharing" in Figure 4 and provide this information to the business user to direct them through the rest of the decision-making process. Some examples of information provided to business users to initiate this process are revenue decreases below a certain level, costs within the supply chain exceeding certain levels and other opportunities for revenue within the sales pipeline.

These decision-making steps can be narrowed down into more broad activities (Smith, 1998):

Issues detection – identify the issues that are occurring within the business.

Issue definition – define the issue and what the source of it is.

Response identification – from the issue identified, formulate a response to effectively

Response implementation – implement the response to the issue and source of it that has been identified.

Information detection and definition fits within the Information Sharing step of Figure 4 and is where power users spend the majority of their time.

Crystal Decisions currently focuses on Issue detection and Issue definition with its technology. As these activities and discovery is the core of business intelligence and meets a large percentage of users (casual users which is up to 60% in some organizations (Gile, 2002)), they should continue to be focus areas. An appropriate tool to aid business users and power users to complete these activities will ensure efficiency in decision-making.

5.6   The Decision Makers

According to Keith Gile from Giga, there are five concentric rings of users with their own functional requirements that need to be enlisted to ensure that Business Intelligence is successfully used and implemented within the organization (Gile, 2003). As mentioned earlier, two of the groups that we have been particularly focusing on are power users and business users as many vendors, including Crystal Decisions, are currently not focusing on them. There is a large opportunity with these user groups as they spend a large percentage of their time with

conducting analysis and up to 30% of an organization are business users who make decisions and

need information to validate their decisions.

Business Intelligence Enterprise User Classification

IT (1-2%)

Power Users (2-5%)

Business Users
(5-30%)

Casual Users
(30-60%)

Enterprise Users
(60-100%)
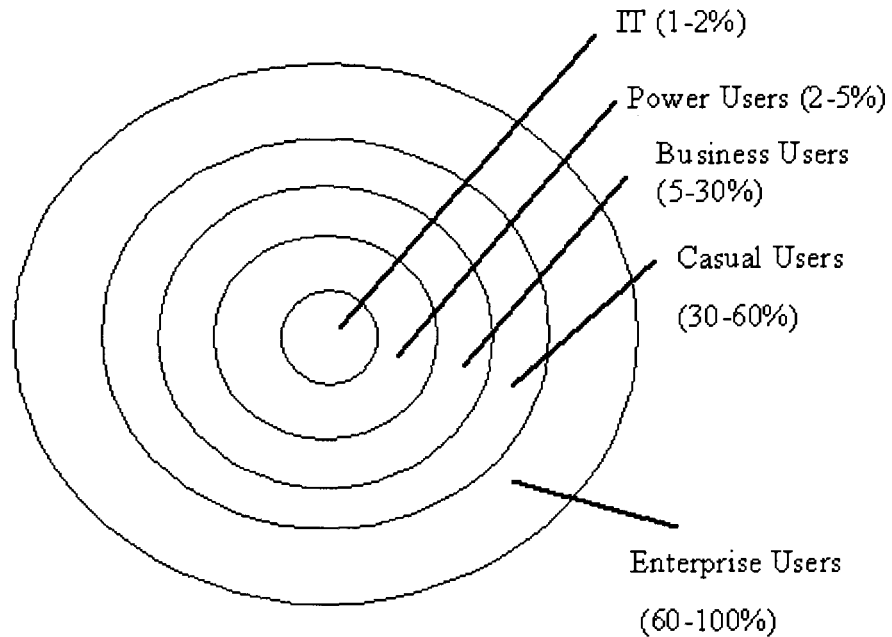
Source: Created by author based on Gile (2002): Enterprise Business Intelligence User Classifications — The Rings of Power

Figure 5: Business Intelligence Enterprise User Classification

The first and inner circle is IT. This group constitutes 1-2% of the enterprise and is

responsible for centralized data and architectural initiatives.

The next outer circle is the power user. They conduct *ad hoc* query, OLAP data mining

and more in-depth analysis. This is 2-5% percent of the organization and is classified as the "BI

Ghetto", where most analysis stays and never gets disseminated throughout the organization.

The third layer is one of the two user communities that usually are missed in tool

business intelligence decisions. These are the business users. This group depends on the analytic

producers who provide information based on the analytic process. Business users need to modify and investigate their information to improve business performance. This user community represents 5-30% of the organization.

The second to last circle is the casual user who requires report development with formatting and irregular access to pre-built applications. Casual users represent 30-60% of the enterprise.

The group in the final circle is called Enterprise Extended users and is another group that has not had much attention in the past. In their business they need information delivered through one of many different delivery mediums including web, devices and paper. This group represents 60-100% of the organization.

Of these 5 users groups, not all are decision makers. See Table 1 (% of users in BI). Business users, casual users, and enterprise extended users are the decision makers within the enterprise. These users are a mixture of executives, middle management, and operations as mentioned above. These groups are influential and need tools to be able to aid their decisions. Crystal Decisions needs to focus on those user groups that are currently not having their needs met with product development.

5.7 Effort in Decision Making

According to William Morris with regards to decision making, "most of the effort consists of developing the concept or the model of the decision through the processes of searching for alternatives, predicting the outcomes, and evaluating them in terms of the decision-maker's objectives" (Morris, 1968).

Most decision making by humans is concerned with the discovery and selection of satisfactory alternatives; only in exceptional cases is it concerned with the discovery and selection of optimal alternatives (Morris, 1968). Power users need to understand this need when creating information to provide to business users.

5.8 Computer-supported Decision Making

There are currently different levels of acceptance of computer-supported decision making within the enterprise. Many people find computer-based tools difficult to use. There is often a lack of user friendliness and an inability to collaborate with others because different applications are used throughout the organization. Familiarity with the application environment is very important to ensure a more rapid learning curve with the tool.

5.9 How Tools currently support the Decision Making Process

Despite the large investments that companies have made over the past 5 years, people are still using Microsoft Access/ Microsoft Excel. Individuals are still formulating their budgets,

sales and profitability targets and reports manually in spreadsheets. This data is gathered by

individuals from multiple sources and time is spent discussing whether the information is

accurate. This is an inefficient process of using tools to support decision-making.

The most used tool for making business performance decisions is Microsoft Excel. There

are 150 million users[11] of Microsoft Excel in the market today and therefore it is ubiquitous

throughout organizations. Power users and business users use this tool not only because everyone

has it within and beyond their organization, it also helps minimize the time from analysis to

action. As a power user from a Crystal Decisions customer said, "if you can think of it, it

[Microsoft Excel] can do it."[12] People also use this tool because it works with all of their other

applications, which are predominantly produced by Microsoft.

5.10 Examples of Customers using Tools to support Decision Making

Community banks and retail store chains are a couple of examples of customers using

tools to support the decision making process. Community banks use tools in a variety of ways

including: analyzing the performance of individual business units, understanding and improving

customer relationships and determining more profitable loan and deposit strategies (Davidson,

2003).

An example of a bank using a tool to improve customer relationships is BancorpSouth,

Yupelo, Missouri. The bank focuses on customer relationships and allows for better pricing

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[11] http://www.olapreport.com/products/OLAP_spreadsheets.htm (June 29, 2003)

[12] team.crystaldecisions.com (June 22, 2003)

46

decisions to be executed through the bank. Through the tools used, analysis is pushed out to the managers who are personally dealing with the actual customers and pricing decisions are determined. The success of this analysis for BancorpSouth can now be seen in its stock performance – in 2001/2002 the stock price increased 50% to $19 per share (Fuchs, 2002).

Another example from a study conducted by Professor Alan Montgomery of Wharton University found that tools aiding decision support in category management (managing multiple product categories) in a store chain improved operating profit by 25.8% (Sequent, 2003). This was conducted through managing price levels at the store level instead of adopting a uniform policy across all stores.

5.11 Challenge with Human Decision Making

Human beings have tendencies to make decisions based on opinion, not fact. Many people face the issues of "ignorance, pride, and fear' when making a decision. Ignorance, pride and fear can cause arrogance and feelings of pressure due to time constraints and unfamiliar territory for decision making. These issues coupled with the increase of complexity within the business environment demonstrate the importance of appropriate business intelligence tools.

Business decisions are not all rational decisions. Some decisions that are made result in negative performance and people do not like to take responsibility. This lack of accountability can cause a person to make decisions that ultimately end up damaging the organization.

Information Management tools are often used to "rationalize emotional decisions" "Statistics – if you torture them enough and they'll tell you anything"(Rogge, 2002).

5.12 Crystal Decisions' involvement within the decision making process

Crystal Decisions focuses on helping with issue recognition and definition. It focuses on creating intelligence on historical data and helps companies to review metrics like corporate performance in an interactive way.

The strength of Crystal Decisions is with its infrastructure and providing robust reporting to casual and enterprise extended users. Even though the product line is extending, Crystal Decisions has very minimal focus on enabling power users and business users to gain insight into issue recognition and definition. Power users currently do not have the tools available from Crystal Decisions to be able to gain deep analysis into the organizational data and initiate the decision making process. Business users do not have tools available from Crystal Decisions to complete making the decision. To be able to provide power users and business users with the tools to interactively identify the issue and the response they should take, is critical to maximize revenue opportunities and minimize costs.

5.13 Conclusion

In order for Crystal Decisions to capture more market share, it is essential to understand how individuals within an organization make decisions, how they are involved in the process, what challenges they face and what appropriate tools are needed to support this process. As Keith Gile determined through his research, there are 5 groups of users within an organization and they are: IT, power users, business users, casual users, and extended enterprise users. Business users facilitate strategic business performance decisions while power users aid this

process and make minimal tactical base decisions. Crystal Decisions currently focuses on IT, casual and extended enterprise users but do not focus on power users and business users who are a large part of the decision making process (approximately 30% of decision makers) within the organization.

There are two extreme approaches to decision making and they are "guess and hope" and following a decision making process. The "guess and hope" approach involves human decision-making where some decisions are made based on opinion not fact. This results in decisions that are purely emotional and may not be rational.

The decision making process includes many steps to ensure positive business performance results. One of the key areas of decision-making is information sharing. This includes issue detection and definition within the process and is a key area that needs to be supported, particularly by power users. As mentioned above, Crystal Decisions currently focuses their tools on this area for IT, casual users and extended enterprise users but not for power users and business users. For business users to accept computer-based tools, user friendliness and familiarity of the tools need to be taken into consideration. Acceptance of these tools will increase the ability to collaborate and evaluate the outcomes for the potential decision in terms of the decision-maker's objectives.

Crystal Decisions needs to focus on the needs of power users and business users within the decision making process. Power users need to be provided with the tools that will efficiently allow them to analyze and package information corresponding to the business users' decision making process and provide it in usable and understandable format. Business users need to be provided with familiar, user friendly tools that will allow them to easily review and improve their

business performance based on fact, not opinion, to identify and execute on the appropriate

response to an issue.

6 END USER ADOPTION OF TECHNOLOGY

6.1 Chapter Overview

For end users to adopt technology, there are many facets to consider including: usability, ease of use, where the tools exists in the technology adoption lifecycle, and awareness of the solution in the marketplace.

When the IT department builds solutions for end users, there is generally a comment from this group that "we built it and they didn't use it". This is usually due to a couple of reasons:

- Exhaustive surveys took place on what a solution is supposed to do but not on how it should work or who will be working with it.

- IT developed a solution without any end user input

Chapter 6 addresses a few major issues and how they affect end user adoption of technology. This chapter describes 2 models of adoption - the Technology Adoption Model (TAM) and the Theory of Reasoned Action (TRA), and describes 2 perspectives of adoption of technology: Diffusions of Innovations and Economics of Technology Standards, and the 5 stages of the "Technology Adoption Life Cycle". This helps to understand the theories and perspectives as to why users adopt technologies.

The second section of this chapter describes brand equity and how valuable it is to companies when introducing new products to market. I explore the causes of dilution of brand

equity, the relation of communication and brand dilution, and understanding what Crystal Decisions provides in regards to branding.

6.2 User Acceptance of Computer Technology

According to Davis (1989), there are two models around user acceptance of computer technology. According to these theories, there are multiple internal and external factors that investigators have determined will affect whether a user will adopt a technology. The factors are: user involvement in system development, type of system development used, nature of the implementation process and cognitive style.

The Theory of Reasoned Action (TRA) developed by Fishbein and Ajzen states that a person's performance is based on his/her behaviour intention and this is founded on a person's attitude and subjective norm, which is the person's perception that people who are important to them think he/she should perform the behaviour. This model is intrinsically driven.
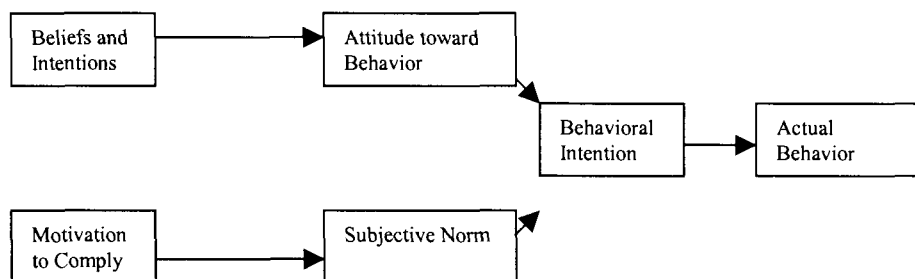
Source: Created by author based on Davis (1989): User Acceptance of Computer Technology: A Comparison of Two Theoretical Models

Figure 6: Theory of Reasoned Action Model

Another model that was created by Davis is the Technology Adoption Model (TAM) This adaptation of the TRA states that it is critical to trace external factors on internal beliefs, attitudes and intentions and that adoption is based off both internal and external factors. TAM focuses on 2 attributes in particular: perceived usefulness and perceived ease of use. Perceived

usefulness is the perspective that a person believes that his/her use of the technology will increase his/her job performance within the company. Perceived ease of use is the belief that a system will be free of effort.

Figure 7: Technology Adoption Model

In conclusion, even though these models are quite different and the TAM approach is based off the TRA model, there are commonalities/differences between them that are important to discuss when planning to ensure adoption with new audiences such as power users and business users. One of these is the perceived usefulness in the TAM approach and motivation to comply with people such as management in the TRA model. This combination suggests that people want to perform to increase their business performance and if these tools are both easy to use and can help impress their superiors they are more likely to adopt it. Therefore, when ensuring adoption of tools from companies such as Crystal Decisions, it is important that people are able to get their jobs completed more quickly as they will be rewarded for this.

Perceived ease of use (EOU) is another important aspect of the TAM model that should be taken into account. A tool needs to be seen as free of effort. Factors that would affect EOU are: product features such as buttons, icons, and touch screens as well as other external product

services such as training, documentation, and user support. Some suggestions for actions that can be taken from these models to ensure adoption are: exposing users for one hour to a prototype system before it is fully developed which will help provide feedback for changes and ensure adoption. As well, from the many studies that Davis has done, usefulness was seen as more important to focus on than ease of use. Therefore, more focus should be given towards business intelligence tools to ensure performance and accuracy of the information given to users, than adding more features to make the tool easy to use.

6.3 Perspectives on Adoption of Technology

There are a couple other potential viewpoints as to why companies adopt technologies: Diffusion of Innovations throughout the organization and Economics of Technology Standards (Fichman & Kemerer).

6.3.1 Diffusions of Innovations

Diffusions of Innovations has determined that a "process of communication; when and how a potential adopter learns about an innovation are important determinants of whether the individual will adopt." There are 5 attributes that they have determined lead to adoption of technology and they are:

1) Relative advantage of using the technology

2) Compatibility with other applications and business processes

3) Complexity of using the technology

4) Trial ability without major expense of effort

5) Observability of the results and benefits can be communicated to other people

6.3.2   *The Economics of Technology Standards*

The Economics of Technology Standards focuses on "increasing returns to adoption" which is defined as the adoption of the technology being dependant on how large the community of adopters are. Sources that lead to adoption are:

1) Learning by using

2) Positive network externalities – number of current users

3) Large base of compatible products

The economic factors that affect technology adoption are: the prior technology because it already has a large install base; return on investment because once the money is invested they will not get it back; sponsorship internally of the new technology; expectations around the new future technology being positive.

There are multiple considerations when purchasing tools. Both the Information Technology department and the tool user need to be involved in the decision making process. There needs to be a project management team put in place for the implementation of a business intelligence solution. The "project management team needs to identify the stakeholders, determine their requirements, and then manage and influence those requirements to ensure a successful project" (Product Management Institute Inc., 2000). On this team, to ensure full adoption of the business users, a power user from the business unit needs to help lead the project with IT.

Power users and business users are key producers and users of information and need to gain insight into their information to enable decision making to take place. It is important to understand their profiles and challenges in the current enterprise environment.

6.4 Technology Adoption Life Cycle

Usability and ease of use are features that are important to adoption with the TAM model. However, when a BI tool is chosen and introduced to an organization, there is a process by which users adopt technology. It is important to analyze this process and where Crystal Decisions stands with their product line as this will ensure more end user adoption of technology and will enable more thorough recommendations. According to Geoffrey Moore, organizations that are selling their technology can sit within five different segments or stages along the "Technology Adoption Life Cycle" (Moore, 1999).

1. Innovators – also known as "Technology enthusiasts". These are people that become committed to the technology very early, as they like to get their "hands dirty" and play with it. They do not mind having to use version 1 technology and they usually dig further into the product to find out all the features that the product will provide them. They have a small amount of influence on the buying cycle but are somewhat important as advocates for the technology. As suggested by Geoffrey Moore, this group can be targeted through products that are seeded in the market.

2. Early Adopters – who are also known as "Visionaries." These are people that want to adopt a technology because they want to start a new future to ensure a competitive advantage. They like being heard and therefore, are the first group that really helps a company adopt the technology.

Once they have adopted the technology, this group is also very demanding on the R&D department of the acquired product. They demand special modifications that only they would utilize.

3. Early majority – who are also know as "Pragmatists." These are people that make the majority of the technology purchases. They do not like technology and they want to make their systems work more seamlessly and efficiently. They rely on references when purchasing. This is the market that is critical for Crystal Decisions to own part of to ensure uptake of the solution.

4. Late Majority – who are also known as "Conservatists." The Late Majority includes customers who do not believe and are pessimistic about achieving any value from technology. They are sensitive to price and are very demanding. Their demands do not usually get met because they will not pay for services that will help them to be productive much quicker.

5. Laggards – who are also known as "Skeptics." These people are not adopters necessarily of technology; they are critics and need to be sold around.

Between the early market and the pragmatists in the adoption cycle, movement seamlessly from the one target group to another is very difficult due to what Geoffrey Moore calls the "Chasm." This is an area that many technology companies fail because they do not change their go-to-market techniques. The early adopters are looking for products that just "work" and the pragmatists want the "whole product."

The pragmatist is the segment that has the largest potential for revenue, it is important to target a beachhead (niche) market, which resides within the group. This identified group would

be those people that other conservatist colleagues look for validation from to ensure their needs are met and to make a safe technology purchase decision.

With its expanded product line, the current Crystal Decisions technology resides within the early adopter market. It is important for Crystal Decisions to target their entire product suite their early adopters to become visionaries and make them happy and supply references for the pragmatists. Pragmatists need to be supplied with references and a whole product with limited usability problems. To subsequently capture the rest of the market, prices will be able to be decreased to meet the needs of the conservatists.

An example of a company that has successfully crossed the chasm is Lotus Notes (Notes). When Lotus Notes was introduced to the market, its technology was not like any other. In the past, the most important function of a database, which collects information, is to minimize and ultimately cease the large amount of file duplication and consolidate it in a centralized place. However, Notes went against this paradigm and created "replication" to enable all users to share information no matter where they were in the world through email. Users saw this opportunity as a tool that had increased usability. There are now competitors such as Microsoft Exchange that also holds a very large market share in this area. So how did they cross the chasm?

Notes crossed the chasm by initially focusing their efforts on the "enterprise vision of corporate communication" and then narrowing it down to a more focused level of a business solution that was targeted at a specific function. The first niche that they targeted was global account management. They narrowed in on worldwide accounting and consulting firms because they had just won a sales deal with a visionary at Price Waterhouse Coopers for 10,000 licenses.

Crystal Decisions has crossed the chasm with some of their products for IT and developers, but not with the product suite for business users and power users. This may be due to the lack of awareness but could also be due to the technology and the focus on the user that the technology was built for. There are many reference customers with Crystal Reports but these customers do not aid the adoption for those power users and business users who are heavily involved in the sales cycle.

Crystal Decisions' product suite and new technologies for power users and business users need to gain more end user adoption to be accepted as a standard for companies. For software to be adopted and become dominant, it must defeat a number of obstacles of adoptability (Fichman & Kemerer) and implementation through a project team.

6.5 Branding Effects on the Adoption of Tools

Apart from the actual tool and the value it provides the user to ensure adoption, brands are an important asset of any technology organization, especially if they are well established. Brands enable organizations to sell to specific audiences and be the go-to vendor for a solution to a problem. "Most think of marketing as merely selling and branding as an advertising campaign or a slogan"(Ward, Light, & Goldstine, 1999). Brands allow companies to sell at prices that are above their costs, ensure more seamless market entrance with new products and increase opportunity for attracting new customers. The cost of introducing a new brand in some markets has been estimated to be from $50 million to more than $100 million (Keller & Aaker, 1997). A brand is a name, term, symbol or design, which identifies and distinguishes the products and services marketed by a firm from those of its competitors. Brands are assets that need to be extendable and managed effectively.

A brand can be business-to-business or business-to-consumer based. Business-to-business products are usually branded with the company's name as the discriminator and not as a sub-brand (e.g. Crest Tooth Paste is a sub-brand of Procter and Gamble's). For these types of products, evaluation is not only based on product attributes but on the company itself. Company evaluation includes employees, skills, responsiveness and their channel partners.

As mentioned earlier in this paper, Crystal Reports, now the world leading *desktop* report writer, was Crystal Decisions only product for four to five years. In 1996, Crystal Decisions extended its product line into other areas to include a large focus on the enterprise and analysis for different users throughout the organization.

Despite these additions to the product line, there was lack of adoption of the new enterprise products released by Crystal Decisions because of the difference between the brand extension and the expectations of the market for the current desktop product. Vendors will see more adoption of their technology if they focus their branding on new products. It is important to determine how to effectively bring these products to market and meet the needs of users and business users that have not been addressed before.

6.6 Business-to-Business Branding

There has been very little brand equity research done on business-to-business companies. Most of the research that has been completed to date has been focused around consumers, but this research is appropriate to my analysis. For business-to-business brand equity, potential customers looking at purchasing a product are not just looking at the product but at the company

as a whole and are more concerned about "source credibility"(Keller and Aaker, 1990). Does the company have a good reputation; is their name synonymous with quality and service etc.?

As Gordon, Calantone, and Benedetto, wrote in their Journal of Product and Brand Management article Brand Equity in the business-to-business sector (1993), brand equity is a "potent source of competitive advantage, as it permits brand differentiation and high levels of brand recognition, even among non-users." As Keller and Aaker wrote it is important to leverage a strong brand name to reduce the risk of a new brand because of the familiarity already established. Brands can be based around an image that they build cutting edge products such as Lucent, whose message to the market "in effect is 'We know competitors will match us, but look to us to be the first with the newest technology.'"

Some researchers have said loyalty is usually global and extends across product lines. Any efforts to position new products in a method differing from those existing may be very difficult and may have challenges with adoption. This adoption does not only encompass the product and company but also its channel. In a lot of cases, the user would rather change their products and not their channel partners. Distribution channels are important for adoption with business-to-business organizations. They are a key component of a product solution and can address different users.

6.7 Causes of Dilution in Brand Equity

Many opinions exist as to what causes dilution of brand equity and decreasing the opportunity for adoption[MP1]. Price, quality, and the company itself are consistent factors with business-to-business companies; however, there are other attributes that cause parent brand

dilution due to a brand extension that may happen with a product that could be developed by Crystal Decisions just for business users. There are close and far extensions to a product line or category (e.g. far brand extension is a parent brand of Microsoft® Office and an extension of Microsoft Xbox) and differing opinions as to what affect each have on dilution. It is important to avoid producing the wrong extension, as it could be damaging to the brand and may be very expensive to the business and decrease adoption (Keller and Aaker, 1990).

Some researchers, such as Keller and Aaker (1990 and 1997), have determined that there is a high importance of brand affect and category similarity. They determined that 'poorly' rated extensions come from lack of perceived fit or similarity to the original product. However, other researchers such as, Broniarczyk and Alba, have determined that brand associations dominated over the affect of the parent brand and product category similarity. In some cases, there was an opposite affect on brand preference. For example, in the breath mint category, Close-up was preferred more than Crest as it has a better perception with fresh breath where as Crest was preferred in dental care. Another example is Apple Computers being known for user friendliness.

It is important to determine whether an extension is suitable to the specific product at hand. As Gordon, Calantone and Benedetto wrote, sometimes a "lower priced, lower quality product actually weakened not only the market standing of the higher quality original product, but also perceptions of the firm's entire product line." To get a product extension adopted, according to Keller and Aaker, it is important that the brand extension is not seen as something where the value does not equal the cost, it is easy to make and/or is being released to the market just to make a large amount of money [for the company].

This analysis is relevant to this paper as there is currently not much awareness of Crystal Decisions' products with business users and power users. For this adoption to take place, users need to understand that enterprise technology is now the focus of the company. Most importantly, it is essential to demonstrate to these users that this technology is usable and will allow them to be more productive when making decisions.

6.7.1   Communication and Brand Dilution

"Powerful brands make promises that are enduring" (Ward, Light & Goldstine, 1999). Many companies have been let down by vendors that they work with as they communicate and promise a lot and deliver less. With brand extensions such as a business user tool, this could cause dilution to the parent brand equity due to unmet expectations. As Goldstine, Light and Ward wrote "the credibility of a company's promise of value results from persistence and consistency."

As mentioned earlier, for a brand extension to be successful, it needs to be determined as to whether the same channels can be used as the current parent brand. If the extension has a target of current non-users of the company, new distributors may need to be enlisted and a different communication message may need to be created.

6.8   Branding – Understanding of what Crystal Decisions provides

From this research, there is a lot of information that can be applied to the challenges at Crystal Decisions. Crystal Decisions needs to be able to deliver products to market that have a positive connection to the parent brand and are not seen as de-focusing the company. Like Apple

Computer with it image of user friendliness and Lucent Technology with innovation, Crystal Decisions needs to define brand associations linked to important benefits with business users and power users.. This will allow Crystal Decisions to own a competitive differentiator and to gain market share.

The target markets of Crystal Decisions with these new brand extensions in enterprise and analysis are non-users of the parent brand. It is important to define the appropriate distribution channels and whether the benefits of the product are similar and could be adapted to those of the parent brand association. Successful relations with new channel partners and product positioning will ensure a good new customer experience. If a brand extension does not fit within the parent brand, a different brand name and association should potentially be established.

Communication and corporate marketing are other areas that Crystal Decisions can use when adding a brand extension. As written by Keller and Aaker (1997), if the product positioning for the corporate brand extension is similar to the corporate marketing activity, expectations of the consumer are less likely to be negatively affected. Like 3M, if Crystal Decisions focuses on being an innovative solutions company, this would provide the most valuable enhancements to any corporate brand extension.

6.9 Conclusion

Adoption of technology within organizations is a large challenge. Only 25-30% of software that is purchased by an organization is actually used in production. There are many factors to consider that will ensure the adoption of a technology. They are: features such as ease of use and usability, learning by using, attributes with the products that lead to adoption where

the technology resides in the "Technology Adoption Life Cycle", branding of the technology from the vendor, and ensuring a project management team is in place. No matter if it is a power user or business user they both adopt technology but will have different priorities of attributes (e.g. level of complexity for power users is higher than business users).

Branding is an important asset of a technology vendor. Brands allow organizations to attain assets that identify and distinguish the products in its portfolio from its competition. Crystal Decisions has gained significant branding over the past 19 years in desktop reporting from its Crystal Reports product and in 1996. Crystal Decisions extended its product line into other areas including a significant focus on the enterprise. Until recently, due to the difference between the parent brand and the brand extension, the lack of brand equity within the enterprise market has minimized the potential uptake with users. Despite having some tools in the product portfolio for them to use, power users and business users within the organization have not "come on board. Crystal Decisions needs to focus heavily on marketing messages around the enterprise to re-focus external perspectives of the company.

Another reason for a minimal amount of adoption with business users and powers users is that Crystal Decisions entered the enterprise market in 1996 and with its extended product line, it currently resides in the early adopter market. To increase this penetration of adoption, Crystal Decisions needs to focus on receiving references from its early adopters to capture the pragmatists and cross the chasm.

Finally, there are two potential viewpoints around similar product attributes that need to be considered when determining whether a company will adopt a technology and they are: Diffusions of Innovations and the Economics of Technology Standards. The attributes associated

for the Diffusion of Innovations are the company sees the relative advantage of using the technology, the compatibility with other applications and business process, complexity of using the technology and ease of triability. The Economics of Technology Standards sources that lead to adoption are learning by using, positive number of users and a large base of compatible products. Crystal Decisions needs to take these sources of adoption into account when planning future enhancements to the product line for power users and business users.

Once the attributes for the products are prioritized to maximize user adoption, a project management team needs to be put in place that includes representatives from both the power user and business user community to ensure their needs are met. When implementing a business intelligence solution, Crystal Decisions should suggest that a project management team with the right stakeholders be put in place to ensure increased adoption of the software within these organizations.

7 RECOMMENDATIONS FOR THE CRYSTAL DECISIONS BUSINESS INTELLIGENCE SUITE

7.1 Chapter Overview

In chapter 7, I make a series of recommendations for Crystal Decisions' Business Intelligence suite from the preceding analysis. To answer the question of this paper "How can companies, like Crystal Decisions, expand their market share and adoption within companies and target and meet the requirements of those users whose need for software programs in decision making are not currently addressed?", Crystal Decisions needs to focus on both product development and their go-to-market strategies. For Crystal Decisions to maintain a competitive advantage and increase revenue to reach the "New Enterprise Business Intelligence Suite" is important for this organization to effectively target business users and power users, to meet their specific needs. Organizations implement business intelligence tools because they are trying to receive a return on investment on their data and provide insight to business users to identify areas of opportunity for revenue and cost savings.

Organizations consist of five different audiences: IT, power users, business users, casual users, and extended enterprise users. Business users are decision makers and power users help facilitate the decision making process and their needs for tools in this process are very different. Business users need to improve revenue of their business unit and identify areas of opportunity through issue detection and identification. Power users package information according to the business process (e.g. results around inventory and costs) and contribute to initiating the decision making process. There are three levels of decisions within the enterprise starting at the most

important with strategic decisions with line of business managers and executives to operational decisions in fulfillment.

Many end users make decisions using a combination of the two extreme approaches: "guess and hope" and using a "decision making process." This does depend on the task at hand and what information and tools are available to assist in the process. Human decision-making can be very inaccurate but many end users find computer-supported decision-making difficult to use and thus adversely affecting the process of decision making. Allowing business users to conduct analyses through using tools, companies have realized profitability and increases in stock price.

It is important that Crystal Decisions tools support the decision making needs of end users and also encourage these users to adopt the technology once it is purchased by the company from the vendor. Crystal Decisions currently has challenges with branding in the enterprise business intelligence space and this causes companies to not adopt their technology because of lack of credibility. Crystal Decisions' enterprise product suite needs to achieve more wins within the early adopter market to encourage adoption by pragmatists and cross the chasm. This suite also needs to be identified as having attributes of adoption such as learning by using, large number of users, advantage in using and a base of compatible products.

Below are the recommendations for Crystal Decisions and their BI product suite to ensure it is meeting the needs of power users and business users, and their need for making and facilitating the decision making process. I also make recommendations to increase adoption within the enterprise market.

7.2 Recommendations

For Crystal Decisions to succeed in the Business Intelligence market, it is critical that they maintain a competitive advantage and differentiator (Porter, 1998) over its competitors on its way to reach the new "Enterprise Business Intelligence" market. To achieve this objective, Crystal Decisions needs to enhance its product suite to meet more of the needs of business users and power users and have a solid go-to-market plan to increase its entire product line penetration within an organization.

As identified in this paper, there are many challenges in the current market today. There are many business users and power users that need to make decisions efficiently throughout all activities and steps in making decisions, particularly around issue detection and definition. Users throughout organization continue to use tools like Microsoft Excel/ Microsoft Access which do not ensure a "single version of the truth" and accurate information for the organization to make decisions. Many users are not using the tools that are provided by the organization, primarily because they find these tools do not efficiently support their decision making process and are not usable, do not correspond with the way that they like to visualize the performance of the business and are not easy to use.

Another challenge that faces Crystal Decisions is the lack of awareness of the products that have been released in the past few years that meet the needs of power users and business users. An example of a product that meets the needs of these users is Crystal Analysis. Crystal Analysis has only had limited market adoption and most of these purchases have been from the early majority. Another reason for this lack of awareness is due to the IT departments, who hold the budget for tools that are not aware of the breadth of capabilities of Crystal Decisions.

The recommendations that are proposed in this paper are focused at both the product development and market strategy components of Crystal Decisions to ensure market adoption of its product suite. It is aimed at addressing the market challenges of having the appropriate tool that meets business user and power user needs, the evaluation decision to ensure support of the user community, and the go-to-market strategy to ensure awareness within the enterprise.

7.3 Technical

7.3.1   Product Development

Crystal Decisions has many tools that meet the needs of different levels of users throughout the organization to aid in their decision-making. The focus of this product line has been towards IT, and effectively providing casual and extended enterprise users (which are also known as information consumers) with efficient delivery of formatted reports.

Most vendors have developed tools that are built for power users but do not take into account the critical needs of business users. In the end, the tool that the vendor releases to the market is a product that does not address the important needs of either group. Business users include both executives and business managers and they need a broad range of criteria to ensure that a tool supports the decision making process.

Business Intelligence applications that are used today may be powerful and relatively simple to use, but in most cases only power users use them. Power users need a tool which they can ensure "managers spend more time trading the problem and less time trying to discover or

define it." They need to continue to have a tool where they can make the difficult areas of producing information more efficient to minimize the amount of time business users have to wait to have their requests fulfilled.

One of the particular areas within a business user tool that needs product development focus is data visualization. Business users need "straightforward visualizations and task-relevant outputs" (Clemons, 1991). For both executives and workers, a tool will be utilised if it is easy to use and adds value to the work that is being done.

One of my recommendations for the Crystal Product Suite is to create different versions of the analysis tools. An example is a basic edition for a business user and more advanced edition for the power user. The basic edition would provide the empowerment of the users to conduct analysis on their own, but does not provide the in-depth analysis options such as statistical calculations, multiple functions on a dynamic worksheet, or in-depth formatting that is currently included in some of the Crystal Decisions product line. Its functionality focuses more towards the power user, and therefore, the focal point of these recommendations will be for the business user.

For product adoption, a new edition of technology needs to be seen by these users as a "whole product" and not demonstration software. Crystal Decisions needs to conduct more research into standard business user questions and in what departments, industries and verticals these questions are asked. Once this information is collated, special "out-of-the-box" templates should be created as part of a business user product. It should be targeted towards one group of people within Geoffrey Moore's pragmatist segment such as financial institutions and their sales management. A couple of examples of templates that should be created for sales analysis include

meeting a common need for pipeline analysis linked to a Top 5 potential customer list by revenue, and then a Top 5 potential customer list by % to close.

7.3.1.1   Data Visualization

Data visualization is a trend that business users are starting to adopt. As written by Philip Russom (2000), for data visualization to be used by business users, it must provide out-of-the-box functionality for solving business problems, such as analyzing...customer behavior, product categories and business performance." Data Visualization also needs to be flexible to be customised to particular business user needs.

Business users need to be able to focus on the information discovery and analysis instead of the user interface without feeling that they are using complex visualizations. Instead they should have a "minimally invasive user interface where the user double clicks part of the visualization, drags and drops objects on the screen or right clicks the mouse to select something from the menu. The mouse needs to be an extension of the user's hands" (Russom, 2000\).

It is believed that data visualization has a strong opportunity for adoption in the future. Understanding customers is becoming more important. For example with loyalty programs at supermarkets and helping them understand customers' buying habits. Analyzing this information is critical for ROI on the collection of data. It is important that business users feel that they have no boundaries around their analysis for visualization and that navigation is very intuitive.

Here are some recommendations when implementing more data visualization in the Crystal Decisions product line:

7.3.1.1.1   Ease of Use

Data visualization needs to be easy to work with and understand. It must improve the user's work and also help analysis to make a decision more efficient. For example, if a user sees a negative result on a bar chart, it needs to be easy to navigate and identify what the root cause of the problem is. As Microsoft Excel has become a ubiquitous analysis/decision support tool for enterprises, the look and feel should be similar to that of the Microsoft Office platform.

7.3.1.1.2   Details of Data

Including the details behind the visualizations is important for gaining more insight into what is happening within the organization. One of the challenges that business users have is confirming that the view of data that they are looking at is accurate.

Therefore, the tool for business users needs need to have an easy way to demonstrate where the data is coming from.

7.3.1.1.3   Visual Analysis

For business users, worksheets and tables do not always allow for the uncovering of significant points of interest to immediately signify such challenges as increased costs. Therefore, it is critical to have many visual objects to explain what is happening within the enterprise. Objects such as charts and logos should be able to be inputted across the product line to ensure visual analysis consistency.

7.3.1.1.4   Interactivity

For adaptation of user needs, business users should be empowered to easily modify their analysis with the amount of interactivity they require for the task at hand and be able to share and collaborate with others on their findings.

To ensure business users adopt new data visualization once it is included in the Crystal Decisions product line, particularly more advanced techniques, it is important that Crystal Decisions has reference sites where business users, who are pragmatists, can understand how companies are using these tools effectively within their organization. Therefore, having business users involved as an early adopter or the beta cycle of a new version is important.

7.3.1.2   Task-relevant analysis

Buttons and toolbars should be very similar to what they experience in Microsoft Office, particularly PowerPoint, as they would like to present their findings to other people. Business users should be able to pull different visualizations onto their "workplace" screen by simply dragging different objects from the icon filled toolbars.

When a business user designs the visual information in the web or desktop, the analysis experience should be seamless. If they are to open up their designer which we will call a "workplace", they would be provided with an initial layout and template like PowerPoint that would direct the user as to where they should drop charts, formatted tables, worksheets, insert pictures, text and many other objects. If they were to bring a formatted table or worksheet into their analysis, and they were to choose a chart as their next object, the chart would know from the viewpoint of data what type it should render (e.g. line, pie, bar graphs).

For the business user, the analysis experience should work with the other supported tools that they use regularly as part of their productive day-to-day activities. This will ensure a larger uptake of the tool throughout the organization.

7.4 Market Strategy

7.4.1 Product Suite Adoption

With the current product line, as well as when more techniques/features are implemented in upcoming versions to ensure ease of use for business users, Crystal Decisions sales should ensure that there is power user and end user/business user involvement in the purchasing process.

Because 84% of power users produce data and analysis, and have the largest use of BI systems, they are influencers in the tool purchase process. As mentioned previously in this paper, only 25-30% of software licenses that purchased for a large deployment are actually used. Advice from IDC on ensuring adoption of business intelligence is for companies to execute the implementation under project management principles that encourages business users and IT to collaborate and communicate with regard to expectations.

7.4.2 Product Suite Ubiquity

Crystal Decisions has achieved ubiquity with tools with developers integrating reports into their application and with IT for the creation of enterprise-wide robust reporting. This achievement occurred through the seeding in Visual Studio, Microsoft's development software,

the Crystal Decisions sales force and also through other OEM (Original Equipment Manufacturing) bundles. However, as mentioned earlier with power users and business users, Excel still maintains the tool market for decision-making.

The Crystal Decisions suite needs to not only be easy to use for business users and provide the in-depth data analysis for power users; it needs to be recognized as a tool of choice for these user groups. Seeding of business user tools needs to occur through products such as Microsoft Office, Microsoft Money, and other CRM and financial applications. This will enable business users to become accustomed with Crystal Decisions' product offering. Seeding would enable a low cost approach to the adoption of this technology to allow more trial for pragmatists to witness.

If a product is seeded within another application for business users and power users, branding within the product needs to occur to ensure uptake throughout the organization for other end users. Some examples of branding would be logos and the company name on all analysis documentation produced.

8   CONCLUSION

Based on the preceding analysis, it appears that Crystal Decisions has been, and should continue to follow the System Lock-in strategy. The implication for Crystal Decisions in pursuing the lock-in strategy is to ensure that Crystal Decisions will become the default tool for business users, and power users will be able to produce more effective information for the business. This is the end goal and must occur in a phased and focused approach from both the technology and go-to-market strategy perspectives.

8.1   Phase 1

Crystal Enterprise Business

Crystal Decisions should create a new product that is just targeted to business users called "Crystal Enterprise Business". This product should focus on data visualization and should also enable the business users to segment their analysis into tasks. Business users should be able to create the analysis on their own through out-of-the-box templates to ensure a shorter learning curve.

The data visualization within the first product that is released should have a familiar look and feel like Microsoft Office and have the flexibility and interactivity to move objects around freely on the screen. It should be very easy to use and should be targeted towards a niche market such as sales managers within financial institutions. Crystal Decisions should work with a few customers to ensure they adopt the beta product to provide feedback and become reference

customers. This would enable the pragmatists within the financial institution industry to see how other customers have been using this technology.

In Phase 1, not all the data visualization should be available in the first release as it is important to get this product out to market, but the basics with graphing and integration with Microsoft Office needs to be present. Benchmarks should be created to determine whether the business user product is allowing the end users to be more productive or not. This will indicate whether business users will adopt this product as they see a relative advantage of using the product.

In phase 1, a concentrated effort should be started to ensure the business user product becomes ubiquitous throughout the organization. Crystal Decisions should work with Microsoft and their Office product line to determine how they can bundle with this technology and demonstrate added value above Microsoft Excel. As written by Keller and Aasker, it is important that the brand extension is not seen as something where the value does not equal the cost, it is easy to make and/or is being released to the market just to make a large amount of money.

Targeted marketing conducted by Crystal Decisions is also important. Business users should be targeted through events such as Gartner Group forums and industry conventions such as finance in phase 1. Continuous research should be conducted with this user community and communicated to the product management and R&D departments to ensure that the development of the user interface correlates to what is appealing to business users.

With the addition of this new product to the product suite and the strong enterprise

reporting background, Crystal Decisions will be able to start demonstrating a competitive and

differentiated product strategy and value from Cognos and Business Objects.

8.2 Phase 2

As Phase 1 will take approximately a year to release, and in the technology industry this

timeframe is long, my phase 2 recommendations will be brief.

If Crystal Decisions is able to release a version 1 of Crystal Enterprise Business, within a

year the next version should include more data visualization capabilities and out-of-the-box

templates for other industries such as retail.

By phase 2, Crystal Decisions and Microsoft should have made some progress on

partnerships around Microsoft Office and seeding of this product with these users should begin

during this timeframe.

With this phased approach, Crystal Decisions will have achieved the "New Enterprise

Business Intelligence" before its competitors and will also ensure customer retention and

increased revenue through another product edition revenue stream.

9 GLOSSARY

This glossary provides the full naming of the acronyms used throughout this paper.

BI – Business Intelligence

IT – Information Technology

EBI – Enterprise Business Intelligence

EBIS – Enterprise Business Intelligence Suite

CRM – Customer Relationship Management

ERP – Enterprise Resource Planning

OLAP – On-line Analytical Processing

KPI – Key Performance Indicators

Notes – Lotus Notes

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