INFORMATION TO USERS

This manuscript has been reproduced from the microfilm master. UMI films the text directly from the original or copy submitted. Thus, some thesis and dissertation copies are in typewriter face, while others may be from any type of computer printer.

The quality of this reproduction is dependent upon the quality of the copy submitted. Broken or indistinct print, colored or poor quality illustrations and photographs, print bleedthrough, substandard margins, and improper alignment can adversely affect reproduction.

In the unlikely event that the author did not send UMI a complete manuscript and there are missing pages, these will be noted. Also, if unauthorized copyright material had to be removed, a note will indicate the deletion.

Oversize materials (e.g., maps, drawings, charts) are reproduced by sectioning the original, beginning at the upper left-hand corner and continuing from left to right in equal sections with small overlaps.

Photographs included in the original manuscript have been reproduced xerographically in this copy. Higher quality 6" x 9" black and white photographic prints are available for any photographs or illustrations appearing in this copy for an additional charge. Contact UMI directly to order.

**ProQuest Information and Learning
300 North Zeeb Road, Ann Arbor, MI 48106-1346 USA
800-521-0600**

UMI®

**PRODUCT NEWS RELEASES FOR TIME TO MARKET
COMPETITIVE INTELLIGENCE**

by:

Trevor Jason Izsak

**A thesis submitted to the Faculty of Systems and Computer Engineering in
partial fulfillment of the requirements for the degree of**

Master of Engineering: Telecommunications Technology Management

Carleton University

Ottawa, Ontario

March 2001

© Copyright

2001, Trevor Izsak

**National Library
of Canada**

**Acquisitions and
Bibliographic Services**

**395 Wellington Street
Ottawa ON K1A 0N4
Canada**

**Bibliothèque nationale
du Canada**

**Acquisitions et
services bibliographiques**

**395, rue Wellington
Ottawa ON K1A 0N4
Canada**

Your file Votre référence

Our file Notre référence

The author has granted a non-exclusive licence allowing the National Library of Canada to reproduce, loan, distribute or sell copies of this thesis in microform, paper or electronic formats.

L'auteur a accordé une licence non exclusive permettant à la Bibliothèque nationale du Canada de reproduire, prêter, distribuer ou vendre des copies de cette thèse sous la forme de microfiche/film, de reproduction sur papier ou sur format électronique.

The author retains ownership of the copyright in this thesis. Neither the thesis nor substantial extracts from it may be printed or otherwise reproduced without the author's permission.

L'auteur conserve la propriété du droit d'auteur qui protège cette thèse. Ni la thèse ni des extraits substantiels de celle-ci ne doivent être imprimés ou autrement reproduits sans son autorisation.

0-612-61018-7

Canada

Acceptance Form

The undersigned recommend to the Faculty of Computer and Systems Engineering
acceptance of this thesis

Submitted by Trevor Jason Izsak in partial fulfillment of the requirements for the degree
of Masters of Engineering: Telecommunications Technology Management

---

Thesis Supervisor
Antonio J. Bailetti

Department Chair
John Chinneck

Carleton University
March 13, 2001

PRODUCT NEWS RELEASES FOR TIME TO MARKET COMPETITIVE INTELLIGENCE

By

Trevor Jason Izsak

Abstract

News releases are typically the primary and first source of corporately sanctioned information about a new product. The objective of this research is to discover if relationships exist among company sizes, the number of product news releases published and time to market as defined through news release information.

Eight hypotheses were tested using data from 53 products in the data communications industry. Included in this were 30 products from 27 private companies and 23 products from 13 public companies. The data was collected during the period of February 18, 1999 to September 27, 1999.

The results show that large companies publish fewer news releases than small companies. This is observed in both the period before and after the product becomes available.

In terms of Product Availability, large companies produce more costly products than small companies. For Customer Exposure, large companies find their first customer for new products faster than small companies. It is shown that the longer it takes to bring a product to market, the shorter the time required to find the first customer.

This research is the first empirical study on the relationships between company size, news releases and time to market. Unlike other time to market studies, this thesis expands the definition of time to market to include the time required to find the first customer. In addition, this research provides a repeatable process to collect time to market data without direct contact with organizations. This provides an "outside-in" view of the company providing data that is not subject to the opinions and attitudes of the employees of the corporation.

ACKNOWLEDGEMENTS

Completing a thesis while continuing to work full time has been very challenging. I would like to thank Steve Oxner, my director at Nortel Networks, for seeing value in the TTM program and providing support in this endeavor.

I am very thankful to my thesis supervisor Prof. Antonio J. Bailetti for his comments, guidance and patience throughout this research. Over the last 5 years I have grown to look at Tony not only as a professor but also as a mentor. I would also like to thank John Callahan for his invaluable comments, creative ideas and statistical assistance.

I thank my parents, Edward and Vivian Izsak, for their continuing support and encouragement through the duration of this thesis.

I would also like to thank Kim Hunt for encouraging me to continue while she struggled herself to complete a Masters of Education.

Table of Contents

<u>Acceptance Form</u>	<u>ii</u>
<u>Abstract</u>	<u>iii</u>
<u>ACKNOWLEDGEMENTS</u>	<u>iv</u>
<u>Table of Contents</u>	<u>v</u>
<u>List of Tables</u>	<u>viii</u>
<u>List of Figures</u>	<u>ix</u>
<u>List of Appendices</u>	<u>x</u>
<u>1. Introduction</u>	<u>1</u>
<u>1.1. Objective</u>	<u>2</u>
<u>1.2. Company Size and News Release Variables</u>	<u>2</u>
<u>1.3. Contributions to Academic Literature</u>	<u>6</u>
<u>1.4. Contributions to Management Practice</u>	<u>7</u>
<u>1.5. Other Insights Gained</u>	<u>7</u>
<u>1.6. Organization of the Thesis</u>	<u>8</u>
<u>2. Literature Review</u>	<u>9</u>
<u>2.1. The importance of using news releases</u>	<u>9</u>
<u>2.2. Time to Market</u>	<u>11</u>
<u>2.3. News Releases for Competitive Analysis</u>	<u>12</u>
<u>3. Hypotheses</u>	<u>14</u>
<u>3.1. Product News Release Usage</u>	<u>14</u>
<u>3.2. Product Time to Market</u>	<u>16</u>

<u>3.3.</u>	<u>Aspects of News Releases Not Examined in This Thesis</u>	18
<u>4.</u>	<u>Research Design</u>	19
<u>4.1.</u>	<u>Unit of Analysis</u>	19
<u>4.2.</u>	<u>Research Sample</u>	19
<u>4.3.</u>	<u>Data Gathering</u>	19
<u>5.</u>	<u>Results</u>	30
<u>4.1.</u>	<u>Product Category Creation</u>	30
<u>5.1.</u>	<u>List of products</u>	31
<u>5.2.</u>	<u>Company Research</u>	31
<u>5.3.</u>	<u>Variable and Exploratory Data Analysis</u>	31
<u>5.4.</u>	<u>Results of Hypotheses Tests</u>	33
<u>6.</u>	<u>Discussion of Results</u>	40
<u>6.1.</u>	<u>Discussion of Results</u>	40
<u>6.2.</u>	<u>News Releases Usage and Company Size</u>	41
<u>6.3.</u>	<u>Product Cost and Complexity</u>	42
<u>6.4.</u>	<u>Time to Market and Company Size</u>	43
<u>6.5.</u>	<u>Market Window</u>	45
<u>6.6.</u>	<u>Standardization and Regulation of News Releases</u>	46
<u>6.7.</u>	<u>Limitations of Research Approach</u>	47
	<u>References</u>	48
<u>Appendix: A</u>	<u>News Release Messages</u>	49
<u>Appendix: B</u>	<u>Customer Affect Models [7]</u>	50
<u>Appendix: C</u>	<u>News Releases and Technical Uncertainty [9]</u>	51
<u>Appendix: D</u>	<u>Competitive Analysis Technique Evaluation</u>	52

<u>Appendix: E</u>	<u>Product Categories</u>	54
<u>Appendix: F</u>	<u>List of Qualified Products</u>	60
<u>Appendix: G</u>	<u>Private Companies</u>	63
<u>Appendix: H</u>	<u>Public Companies</u>	71

List of Tables

<u>Table 1:</u>	<u>CMP.net Publications www.cmpnet.com</u>	23
<u>Table 2:</u>	<u>Sample Product Category Table</u>	24
<u>Table 3:</u>	<u>Company Information Sources</u>	26
<u>Table 4:</u>	<u>Date Formats Conversions</u>	27
<u>Table 5:</u>	<u>Product Categories</u>	30
<u>Table 6:</u>	<u>Variable Analysis</u>	32
<u>Table 7:</u>	<u>Variable Normality</u>	32
<u>Table 8:</u>	<u>Variable Name Key for Result Tables</u>	33
<u>Table 9:</u>	<u>Hypothesis 1 Results</u>	33
<u>Table 10:</u>	<u>Hypothesis 1 Results without zero Time to Availability products</u>	34
<u>Table 11:</u>	<u>Hypothesis 2 Results</u>	34
<u>Table 12:</u>	<u>Hypothesis 3 Results</u>	35
<u>Table 13:</u>	<u>Hypothesis 4 Results</u>	36
<u>Table 14:</u>	<u>Hypothesis 5 Results</u>	37
<u>Table 15:</u>	<u>Hypothesis 6 Results</u>	37
<u>Table 16:</u>	<u>Hypothesis 7 Results</u>	38
<u>Table 17:</u>	<u>Hypothesis 8 Results</u>	39

List of Figures

<u>Figure 1:</u>	<u>Variable Relationship</u>	3
<u>Figure 2:</u>	<u>News Release Timing Description</u>	4
<u>Figure 3:</u>	<u>Product Selection Process</u>	20
<u>Figure 4:</u>	<u>Candidate Creation Process</u>	22

List of Appendices

<u>Appendix: A</u>	<u>News Release Messages</u>	49
<u>Appendix: B</u>	<u>Customer Affect Models [7]</u>	50
<u>Appendix: C</u>	<u>News Releases and Technical Uncertainty [9]</u>	51
<u>Appendix: D</u>	<u>Competitive Analysis Technique Evaluation</u>	52
<u>Appendix: E</u>	<u>Product Categories</u>	54
<u>Appendix: F</u>	<u>List of Qualified Products</u>	60
<u>Appendix: G</u>	<u>Private Companies</u>	63
<u>Appendix: H</u>	<u>Public Companies</u>	71

Introduction

News releases are typically the first source of corporately sanctioned information about a new product. News releases disclose information on product concept, product availability and first customer. This information trail can be used as a source of time to market information. Even though news releases are abundant and readily available through the Internet, little research has been done examining the information they contain and how they can be used as a source of information on time to market. This thesis will examine:

- Corporate news release usage: It has been said, “news releases offer the perfect low cost avenue of implied endorsement through subtle suggestion [10].”
- News releases as a source of time to market information: “Telecommunication, computers and the like-- undergo changes with astonishing rapidity,” [15] Product news releases typically contain information describing a product’s time to market and price.
- News releases as a source of competitive intelligence: News releases can contain valuable pieces of intelligence about a competitor [11].

CHAPTER I - INTRODUCTION

1.1. Objective

This thesis will determine if the number of published product news releases is related to company size. For this analysis, company size will be tested against the number of product news releases published and the rate at which product news releases are published.

The thesis will determine if a product's time to market is related to company size. For this analysis, company size will be tested against product price, time to product availability and Customer Exposure. In addition, the analysis will determine if a longer development cycle affects the time it takes to find a first customer.

News releases provide an outside-in view of data communications companies and therefore can be useful for competitive intelligence. This thesis also aims to raise awareness of using news releases as a method of competitive analysis. This will be done through the examination of news releases using the evaluation dimensions outlined in Prescott and Grant [1].

1.2. Company Size and News Release Variables

This section defines the terms and variables used in this thesis. The focus of the thesis is on data communication products and therefore will only examine the news releases of such products. The variable framework shown below describes the relationships and the variables that will be tested in the thesis. The variables can be separated into three categories.

- Company size
- News Release Information
- News Release Timing

Figure 1: Variable Relationship

1.2.1. Company Size

For the purposes of this thesis the number of employees within the organization represents company size.

Number of employees

The number of employees is the total number of full time employees within the organization at the time of the first news release. If the company is a subsidiary, the population listed by the parent company will be used instead of the subsidiary. This is done because the subsidiary often remains tied to the resources and bureaucracy of the parent company.

1.2.2. News Release Timing

A news release is generally less than three double spaced pages and announces news about a company, product or service to media professionals [3]. To be used in the study a news release must meet the following criteria.

CHAPTER 1 · INTRODUCTION

- The release must be an official news release generated by the vendor of the product. This is identifiable by the corporation copyright at the end of the news release.
- The news release makes reference to the product.

Time to Market Framework

To examine time-to-market, the following milestones (figure 2) are used to provide a framework that generates time to market data for each product examined.

First News Release Date (Month/Day/Year): The date of the first news release that makes reference to the product

Product Availability Date (Month/Day/Year): The date when the product is generally available for purchase by customers.

Customer News Release Date (Month/Day/Year): The date of the first news release that indicates a customer has selected the product for deployment in their network, or the date contained in the news release that describes the product selection.

Figure 2: News Release Timing Description

CHAPTER 1 · INTRODUCTION

The three milestones shown above are used to create the following three variables used in the thesis:

Time to product availability (TPA) (measured in days)

Most products pass through an uncertain period where product information has been released but the product is still not available for purchase. This period of time is called “time to product availability” and is calculated by subtracting the “Product Availability date” from the “First News Release date”.

Customer Exposure (CE) (measured in days)

Most products pass through an uncertain period where the product is available but no customer has selected the product. This time is called “Customer Exposure” and is calculated by subtracting the “Customer News release date” from the “Product Availability date”.

Time to first Customer (TFC) (measured in days)

“Time to first customer” is the period from the time product information is released to the public and the time the first customer selects the product. It is the sum of the Time to Product Availability and the Customer Exposure.

1.2.3. News Release Information

To examine if company size is related to news release usage, two variables are collected to determine to what degree the company utilizes news releases. Each of the variables described below can be calculated for the TPA and CE periods.

Number of News Releases

Number of news releases is calculated by counting the number of product news releases published during the defined period.

CHAPTER I - INTRODUCTION

News Release Rate

The news release rate is calculated by dividing the total number of news releases published during the defined period by the duration of the period. The rate is in units of news releases per day.

In addition, one other variable is collected to assist in describing the product under development.

Product Price

Product price represents the price of the product mentioned in the news release. The price must be in U.S. dollars and be mentioned directly in the news release.

1.3. Contributions to Academic Literature

The contributions of this research extend into three distinct areas: news release usage, time to market and competitive analysis techniques.

- Through the examination of news releases it became apparent that different sized companies differ in their use of news releases. To my knowledge, this is the first empirical study that has attempted to find relationships between company sizes and news release usage.
- Most time to market studies do not make a distinction on the products studied in terms of their point on the technology life cycle. This study focuses on new products that are creating a new product category.
- Most time to market studies only examine products up to the point when the product becomes available for sale. This study expands time to market to include the time required to find the first customer. Most studies on the topic of time to market have focused on project data collected through employees directly involved in the projects. To my knowledge, this is the first empirical study that uses publicly available information to provide an “outside in” view of time to market.

CHAPTER 1 · INTRODUCTION

- If competitive information such as product time to market can be measured externally using news releases, there may be other valuable competitive information that can be extracted from news releases. To my knowledge, this is the first study that demonstrates how news releases can be used as a source of competitive intelligence.

1.4. Contributions to Management Practice

News releases have been typically viewed primarily as a source of publicity for a company's product [10]. The processes described in this research provide an end-to-end method to collect time to market competitive intelligence on both private and public companies. Management must be aware that news releases expose product information to competitors and provide product information on competitors. Managers can use this knowledge to develop specific strategies for competitive analysis and marketing communications.

The research suggests that managers should understand the goals they wish to achieve before publishing a news release. If the goals are understood, the messages contained in the news release can be tailored to maximize their effectiveness. Goals may include attracting resources, reducing technical uncertainty, generating publicity for products etc.

Managers must understand that development is only the first have of "Time to Market". They must ensure that their company has the tools and processes in place to support the products introduction into the market. Managers must be aware that in situations where all product factors are equal, large companies have an advantage over small companies through their marketing resources.

1.5. Other Insights Gained

The issues around obtaining product information are different depending on the type of company researched. Public companies may be comfortable releasing time to market information but that information can be influenced by the opinions of the source. Private companies often keep tight control of the information they release, making any research

CHAPTER 1 - INTRODUCTION

on their products difficult. News releases are a common medium used by both public and private companies to distribute product information.

The view that large companies take longer to develop products is not seen in the research. There appears to be no difference between large and small companies in the time required to develop a product. However, the research did show that large companies develop more expensive products than small companies.

Unlike development, marketing is not typically outsourced. Due to this, small companies will have difficulty competing with large companies in terms of product marketing.

1.6. Organization of the Thesis

Chapter 2 contains a literature review that provides the rationale behind the hypotheses examined in the thesis. This chapter will cover literature in the areas of time to market, competitive analysis, advertising, and business-to-business marketing.

Chapter 3 outlines the 8 hypotheses with information on test rationale and variables used.

Chapter 4 contains the research design of the thesis. It covers the research sample, the data collection process, and data analysis techniques.

Chapter 5 outlines the results of the study including products examined, statistical analysis and results of the hypothesis tests.

Chapter 6 covers the results observed in the thesis and provides discussion on the results. This chapter also describes the limitations of the approach used in the thesis.

2. Literature Review

For this thesis, literature was reviewed in the areas of time to market, competitive analysis, advertising, and business-to-business marketing. Section 1 examines advertising and marketing literature to explain the importance of using news releases. Section 2 examines time to market literature describing how time to market is critical for new product success. Section 3 examines competitive analysis literature to describe how news releases can be used as a new and powerful tool for competitive intelligence. Section 4 develops the hypothesis rational and testing motivation.

2.1. The importance of using news releases

News releases for startups

The excitement, challenges and potential financial rewards of being involved in a brand new company have created a plethora of high tech startups in the data communication industry. In this environment, large publicly trading companies compete with small, fast moving startup companies. Since small companies with limited brand recognition and marketing budgets are competing with large well-branded companies, by publishing news releases, new companies can create a public image for themselves [10] and give the buying market a better feeling about doing business with the company [10]. It has been said, "news releases offer the perfect low cost avenue of implied endorsement through subtle suggestion [10]". Start-ups must ensure they use news releases to their full potential.

News releases for publicity

Advertising is a powerful tool to maintain and protect leadership after it has already been obtained, but is not the best tool to build leadership of a new product or brand. A new brand must first generate favorable publicity in the media before it will have a chance in the marketplace [6 law 4]. Editorial coverage of a company or its products also outperforms paid advertising because consumers tend to place more trust in the words of

CHAPTER 2 - LITERATURE REVIEW

writers and editors than they do in advertisements [4]. Therefore, the best promotion strategy for new products is to focus first on publicity and then on advertising.

Publicity

Publicity is demand stimulation not paid for by the organization. It typically takes the form of a favorable news presentation in print, radio or television [8].

Promotion

Promotions are elements that inform the market on products and services of the organization [8].

Advertising

Advertising consists of activities paid for by the corporation, which involve in presenting an openly sponsor-identified message regarding a product, service or idea.

News releases are typically the primary and first source of corporately sanctioned information about a new product. Media professionals examine news releases to find interesting stories about which to write. It is because of this that news releases are a critical component to generate publicity for a new product. In addition, the easiest way to increase the coverage on your product is to ensure your product is first to the market [6]. Media writers know that people are interested in what is first, what is hot and what is new. Therefore, for a new product to be successful in the marketplace, promotional strategies must be put into place that:

- Leverage any attributes about the product that are “first of” or “brand new” [6].
- Increase the number of times the consumer encounters the new brand [7].
- Create publicity for the product in the media [6].

In summary, publicity is the most successful method to make the public aware of a new product or service. News releases create media interest and ultimately publicity for a new product or service.

2.2. Time to Market

“Telecommunication, computers and the like-- undergo changes with astonishing rapidity,” [15]. In industries where the underlying technology is advancing quickly, rapid product development is a “huge untapped source of competitive gain”[14] Being first to market generates advantages such as:

- Increased customer loyalty due to switching costs
- Increased market share
- Increased momentum driving future sales
- Higher profit margins from pricing freedom [14]

In the high tech market, large publicly trading data communication companies must often compete with small, fast moving startup companies. Since time to market is crucial for success in this environment, it would be useful to understand the differences that exist between small and large companies with respect to time to market. Time to market studies in the past have typically used data gathered from companies using internal methods such as direct interviews with project managers. Data gathered from sources internal to the corporation are filtered through the beliefs and attitudes of the corporation’s employees. If data could be gathered from sources of information external to the corporation, a new outside-in view of the product development projects would be created. This thesis will show how news releases can create such an outside-in view of product development projects.

Time to market research traditionally measures TTM from project start to when the product becomes available for sale. A time to market definition that includes the time required finding a first customer (Customer Exposure) would be more appropriate because it is directly related to return on investment. In other words, a product is not complete until someone is willing to pay for it. This study expands time to market to include the time required to find the first customer. This study also focuses on new

products that define new product categories. Other time to market studies do not differentiate their products in terms of their place on a technology life cycle.

2.3. News Releases for Competitive Analysis

Electronic Information Sources

“As organizations become more information-based and information from internal and external sources becomes electronically available on demand, traditional corporate functions such as planning, marketing, technical support, documentation and publishing will be dramatically transformed or even eliminated” [Hald and Konsynski][2]. This trend has also drastically changed the competitive intelligence function within corporations. Corporate information is freely available on the Internet through USENET news groups, news releases, job posting, financial reports, and company homepages. Unlike competitive analysis in the past, which relied predominantly on slow moving, pulp-published information sources (trade magazines, analyst reports, product reports), Internet based information is up-to-date and dynamic.

News releases are a very concentrated source of competitive information. The information is accurate due to the fact the news releases are authored and published on behalf of the company. The information is timely because it is in the company's best interest to release information as quickly as possible. The information is readily available because companies typically archive the news releases on their home pages for customers to reference.

Electronically available news releases are relatively new and therefore have not been examined by Prescott and Grant in “Managers Guide for Evaluating Competitive Analysis Techniques”. If news releases are compared (appendix D) to the competitive analysis categories defined by Prescott and Grant [1], it is found that they do not fit into any one of the competitive analysis categories but do fit partially in categories 13, 14, and 17.

#13 Stakeholder analysis and assumption surfacing and testing

News releases contain information on financing, vision, interoperability, partnerships, analyst comments and customer comments. These messages together create a comprehensive list of external stakeholders for the product.

#14 Market Signaling

News releases contain messages that signal the market in terms of vision awards, and product availability.

#17 Synergy Analysis

A list of external synergies can be drawn from news release messages including product interoperability testing and company partnerships.

News releases as a competitive analysis technique are substantially different from the other competitive analysis techniques examined. There is much to be gained by corporations who formalize the process to closely examine news releases of competitors.

3.1 Hypotheses

To gain insight into news release usage, four hypotheses were tested to look for relationships between company size and the quantities and rates of published news releases. To examine time to market, four hypotheses were tested to examine product price, product availability, Customer Exposure and market window.

3.1. Product News Release Usage

The timing and exposure frequency of advertising has been shown to affect a buyer's response [7]. Therefore the timing and exposure of news releases should also have an effect on a customer's purchasing behavior, and it is this purchasing behavior that is important to a vendor selling a new product. The time to market framework developed in this thesis separates the Time to First Customer period into two segments; Time to Product Availability which represent the first half and Customer Exposure which represents the second half of a product's time to market. This separation will allow independent testing of news release usage before and after the availability of the product.

It has been found that the effect of advertising diminishes during the product life cycle [7]. Since the purpose of news releases is to generate publicity for the vendor, the use of news releases early in the product lifecycle is extremely important to generate customer interest in the product. Smaller companies understand they have no track record, and believe that only through publicity will they be seen in the market. Larger companies already have strong brand recognition and market strength and therefore are not as aggressive in their publicity efforts. They will produce less news releases per product than small companies. News releases don't only generate publicity for a product, they also create a public image for the company [10]. A company's image will affect how well they can attract resources such as employees and venture capital. Small companies with limited resources are more concerned with attracting resources than large companies and will therefore publish more news releases. To examine the extent to which news releases

CHAPTER 3 · HYPOTHESES

are used in the early portion of the product's lifecycle, the Time to Product Availability period is examined.

Hypothesis 1: The number of news releases published during the Time to Availability period is negatively associated with the size of the company.

Once a product becomes available for sale (product availability date), the focus turns from attracting resources to marketing the product. Unlike large companies with well-developed channels to market and access to a large pool of marketing resources, small companies have limited channels to market and fewer resources. Small companies will continue to use news releases past the product availability date to assist in attracting customers through the Customer Exposure period, while large companies will focus on using their people for this.

Hypothesis 2: The number of news releases published during the Customer Exposure period is negatively associated with the size of the company.

To minimize any influence the duration of the time to market periods have on the number of news releases, we will normalize the number of news releases by the duration of the periods to create a news release rate for the Time to Availability and customer overhang periods.

Hypothesis 3: The news release rate during the time availability period is negatively associated with the size of the company.

Hypothesis 4: The news release rate during the Customer Exposure period is negatively associated with the size of the company.

3.2. Product Time to Market

Company size is usually related to the resources available. This relationship may affect the types of products developed as well as a product's time to market.

Competitive Advantage through Resources

It takes resources such as employees, money and time to develop products. Large companies are thought to have greater access to resources and larger R&D budgets and should therefore have a competitive advantage over small companies in terms of product development. Large companies can utilize their larger pool of resources to focus on more complex products or to bring the products to market faster than small companies.

Product Complexity

By using product prices as a measure of complexity, we can test if large companies do take advantage of their resource situation to engage in development of more complex products.

Hypothesis 5: The size of the company is positively associated with the price of the product.

Product Availability

If large companies have access to more resources than small companies, we should see that large companies take less time to produce products than small companies. Using news release time to market framework described in this thesis along with product news releases from various companies, we can test this opinion. If such correlations exist, it may be possible to gain insight into product availability of competitors' products.

Hypothesis 6: The Time to Availability is negatively associated with the size of the company.

CHAPTER 3 · HYPOTHESES

Market Acceptance

Marketing is war, and the first principle of warfare is the principle of force. The larger army has the advantage [5]. If this is true, larger companies that have large marketing departments and established channels to market should be able to find their first customer faster than small companies.

Hypothesis 7: Customer Exposure is negatively associated with the size of the company.

Market Window:

As discussed earlier, there are substantial advantages with being first to market in a new product category. In addition, there is the general opinion that if a vendor takes too long to release a product, they will miss the market window and have difficulty selling the product. By comparing Time to Availability with the Customer Exposure we can test this opinion.

Hypothesis 8: The Time to Availability is positively associated with the Customer Exposure period.

3.3. Aspects of News Releases Not Examined in This Thesis

News Release Messages and their Effect on the Customer

Through a close examination of news releases, it was observed that similar types of messages were repeated across news releases. To understand this in more detail, the messages contained in news releases were segmented into 19 distinct categories (Appendix A).

Message content is one of the 3 components of an advertising strategy [7]. The messages that are released to the market affect the customers' perceptions of the product. Various models attempt to explain how the consumer is affected by messages in advertising. (Appendix B)

Depending on the model most appropriate for the product, messages can be tailored to push the appropriate hot buttons of your target market. Communication equipment, which is a good example of an infrequently purchased product, can be considered a very high involvement product [7]. For this type of product, news releases that describe the experiences of other users would be most useful to persuade the customer. In addition, high tech industries are characterized by complex products, a large number of entrepreneurial competitors, customer confusion, and rapid change [8]. To market effectively in this environment, the sources of technical uncertainty must be understood. The sources of technical uncertainty are included in Appendix C.

An area not investigated in this thesis that could prove to be very interesting is how the messages contained in news releases address the sources of technical uncertainty for high tech products. Once this is understood, the messages can be tested against the time to market framework defined in this thesis to see what types of messages have the strongest effect on customers.

4.1. Unit of Analysis

The unit of analysis is a data communications product. For the product to be valid it has to have a defined time to first customer.

4.2. Research Sample

The sample was comprised of 53 products from the data communications industry, which included 30 products from 27 private companies and 23 products from 13 public companies. The data was collected from February 18, 1999 to September 27, 1999 with the final data representing a snapshot of the product as of September 27, 1999.

4.3. Data Gathering.

The data gathering process consists of three steps.

Step 1: Product Selection: Section 4.3.1

Identifies which new products are to be studied.

Step 2: Data Gathering: Sections 4.3.2

Identifies for each new product, which news releases should be examined and gathers data on each product.

Step 3: Data Analysis: Section 4.3.3

Creates new variables from the news release data.

4.3.1. Product Selection

The product selection process provides a method to determine which products from the data communications industry were to be studied. Product categories were used to identify similar products. By collecting data from similar products, the consistency and quality of the data is improved.

Figure 3: Product Selection Process

As shown in figure 3, the product selection process consists of three steps that will be repeated for each product category. The following section describes the data collection process in detail.

4.3.1.1. Product Category Creation

The product categories in this study focus on data communication products. Through discussion with experts in the data communications industry, a number of product categories were designed. A product category was composed of technical specifications and search descriptors.

Technical Specifications

Technical specifications are product attributes that define the product category. Technical specifications are chosen to create a product category with the core capabilities of interest. Products that meet the technical specifications are considered qualified members of the product category. Technical specifications should be attributes that are unique to the product category and easily measured. Example attributes, which are easy to measure, include number of interfaces, number of ports, number of sessions, packets per second, protocols supported etc.

Search Descriptors

Search descriptors are words closely related to the technical specifications that are used by Internet search engines to identify products with the potential to be a member of the product category. Products that are identified using the search descriptors are candidates for the product category.

Search descriptors need to be general to identify candidate products but specific to reduce the number of inappropriate or uninteresting products. The search descriptors chosen for each product category included general descriptors that detail the product core function and additional descriptors that either include or excluded other product details. By placing Boolean operators between the key descriptors, expressions can be built which enable effective, flexible Internet searches. Internet search engines use the Boolean expressions to query the Internet for candidate products. To aid in finding appropriate key descriptors, it is useful to examine the specifications of products that you want to have in a product category.

4.3.1.2. Candidate List Creation

Searching

The objective of step 2 is to identify the products that have the potential to be members of the product category. To generate a list of product category candidates, three Internet search engines are recommended. As shown in figure 5, “techweb” identifies products discussed in data communications trade magazines. “Deja News” identifies products being discussed by network operators. If the first two search engines do not provide an adequate number of candidates “Altavista” can be used to do an all-encompassing Internet search. The matches from the search engines are examined for product information.

Figure 4: Candidate Creation Process

Techweb

Techweb (www.techweb.com) is a web site that archives CMP.net magazines. Since the archives are searchable, if appropriate key descriptors are used, the web site will provide articles on products that have the potential to be members of the product category.

Table 1: CMP.net Publications www.cmpnet.com

Electronic Buyers' News	InternetWeek
EE Times	InformationWeek
Computer Reseller News	tele.com
Computer Retail Week	Data Communications
VARBusiness	Network Computing
WINDOWS Magazine	

Table 1 lists the magazines searched using techweb. From the Techweb page, the advanced search capability feature was used. The key descriptors are formatted such that phrases are include in quotes and any additional descriptors are added with (+) or subtracted with (-).

Example: ["service selection" + adsl] looks for documents containing both the string and the word.

DejaNews

DejaNews (www.dejanews.com) provides a searchable archive of Usenet discussion groups since March 20, 1995. Many Usenet discussion groups focus on data communications products. In DejaNews the "power" search capability feature was used. The key descriptors are formatted such that phrases are included in quotes and any additional descriptors are added with (&) or subtracted with (&!).

Example: ["service selection" & adsl] looks for documents containing both the string and the word.

AltaVista

Altavista (www.altavista.com) provides a blanket search of the Internet. Due to the substantial number of matches that are typically returned, it should only be used as a last resort when the other search engines have not identified an adequate number of products. The advanced query capability feature was used only when examining documents from the previous four months. The key descriptors were formatted such that phrases were included in quotes and any additional descriptors were added with (AND) or subtracted with (AND NOT).

Example: [“service selection” AND adsl] looks for documents containing both the string and the word.

Cataloging

Any products that have the potential to meet the technical specifications are added to the list of candidates. Any products that have been identified through previous searches but which have not been identified through the normal process can also be added to the candidate list. The output from a sample candidate list creation is shown in the sample category table (Table 2). The first column represents the information source of the candidate product, the second column indicates the company that provides the product and the third column contains the product name.

4.3.1.3. *Qualified List Creation*

The objective of step three is to identify qualified products from the list of candidate products. The qualified products will be used in the data collection process while the disqualified products are discarded. Qualified products are products whose specifications meet the specifications of the product category. To identify which products are qualified requires the gathering of detailed information from the vendor’s homepage on the product and comparing it to the category specification. The fourth column contains product specification. The sixth column contains the results from comparing the product specifications with the category specifications.

Table 2: Sample Product Category Table

Broad Band Remote Access Concentrator				
An access server without modems which has the ability to terminate PPP and route/switch the data based on domain				
Service selection + ADSL				
1. Broadband RAS				
2. Subscriber Management + ADSL				
Source	Company	Product	Specs	Qualify
Techweb	Cisco	SMS1000	4000 sessions 20 contexts	y
Techweb	PulseCom	Dynamic connect. Broadband SAM	3072 sessions	y
AltaVista	Newbridge	6510 Service Selection Gateway	L2TP PPP term via 6400	y

4.3.2. News Release Gathering

News release gathering was executed from February 18, 1999 to September 27, 1999

4.3.2.1. Data Collection Methodology

Once the products have been identified using the product selection process, it is relatively simple to collect news releases for each product. The majority of news releases are available publicly from web sites as described below. The quantitative data collected from the news releases have little dependency on opinion or human interaction therefore removing subjectivity from the process.

4.3.2.2. Measures

The data collected for each product was partitioned into three categories:

- a) Company Size
- b) News Release Information
- c) News Release Timing

a) Company Size:

The number of employees in the organization represents company size. The data communication industry is going through heavy consolidation with mergers and acquisitions occurring daily. Therefore, when determining which company to examine, choose the company that existed six months prior to the product debut. Company size information is available through a number of sources.

Table 3: Company Information Sources

The organization web pages Company history and investor information
The Electronic Data Gathering, Analysis, and Retrieval (EDGAR) database (http://www.sec.gov/edgarhp.htm) An archive of company submissions to the U.S. Securities and Exchange Commission (SEC). Only useful for U.S Based public companies. The 10K annual reports for company information.
System for Electronic Document Analysis and Retrieval (SEDAR) (http://www.sedar.com/) An archive of Canadian company security submissions. Only useful for Canadian public companies.
OneSource (www.onesource.com) "Pay for use" database containing public and private company information.
Telephone Many companies provide corporate information over the telephone that is not widely available through other sources.

The data should be representative of the company's situation at the time of the first news release. In situations where data is difficult to obtain, use the best source available.

Number of employees

The number of employees is the total number of full time employees within the organization at the time of the first news release. If the company is a subsidiary, the population listed by the parent company will be used instead of the subsidiary because the subsidiary remains tied to resources and bureaucracy of the parent company.

b) News Release Timing

Product delivery information is available from corporate news releases. A news release is generally less than three double spaced pages and announces news about a company, product or service to media professionals [3]. To be used in the study, a news release must meet the following criteria.

CHAPTER 4 · RESEARCH DESIGN

- The release must be an official news release generated by the vendor of the product. This is identifiable by the corporation copyright at the end of the news release.
- The news release makes reference to the product.

The most convenient source for vendor generated news releases is the company's own homepage. For each product, the following milestones must be identified.

First News Release Date (Month/Day/Year)

This is the date of the first news release that makes reference to the product.

Product Availability Date (Month/Day/Year)

The product availability date is the date when the product is generally available for purchase by customers. The availability date is often unclear; therefore the following process is used to determine the availability date.

If the news release says "available now", use the date of the news release. However, if the news release mentions the date when the product will be available, use the date mentioned in the news release. If multiple dates are available use the most recently provided. If no availability information is available, use the first customer date as the availability date.

Availability information is often presented in the form of 1Q98 or 2H98. For convenience in performing calculations, dates that are indicated by quarters or halves will be represented by the last possible day that meets the definition. Dates indicated by months such as "available in June" are represented by the last possible day in the mentioned month.

Table 4: Date Formats Conversions

Examples:

1Q99 = March 31, 1999

1H99 = June 30, 1999

YE99 = December 31, 1999

June '99 = June 30, 1999

Customer News Release Date (Month/Day/Year)

The customer news release date is the date of the first news release that indicates a customer has selected the product for deployment in their network, or the date contained in the news release that indicates when the customer selected the product. This includes plans to deploy, has deployed and in service.

c) News Release Information

News release information takes the form of number of news releases and number of news releases per day. Each of the four variables described below can be calculated for Time to Availability and Customer Exposure.

Number of News Releases

Number of News Releases is calculated by counting the number of product news releases published during a defined period. This is calculated for both the Time to Availability period and the Customer Exposure period

Product Price

Product price represents the price of the product mentioned in the news release. The price must be in U.S. dollars and must be mentioned directly in the news release.

4.3.3. Data Analysis

From the raw data collected in the data collection process, the following new variables were created.

Time to product availability (TPA) (measured in days)

Most products pass through an uncertain period where product information has been released but the product is still not available for purchase. This period of time is called “time to product availability” and is calculated by subtracting the “Product Availability date” from the “First News Release date”.

CHAPTER 4 · RESEARCH DESIGN

Customer Exposure (CE) (measured in days)

Most products pass through an uncertain period where the product is available but no customer has selected the product. This time is called “Customer Exposure” and is calculated by subtracting the “Customer News release date” from the “Product Availability date”.

Time to first Customer (TFC) (measured in days)

“Time to first customer” is the period from the time product information is released to the public and the time the first customer selects the product. It is the sum of the “Time to Product Availability” and the “Customer Exposure”.

To examine relationships independent of duration of the Time to Availability and the Customer Exposure periods, a new variable News Release Rate was created.

News Release Rate

The news release rate is calculated by dividing the total number of news releases published during a defined period by the duration of the period. The rate is in the units of news releases per day. This is calculated for both the Time to Availability period and the Customer Exposure period.

5. Results

1.1. Product Category Creation

Through discussions with experts in the data communications industry, the following nine product categories were chosen for examination. The categories were chosen because it is felt that they are new to the data communications industry and they are or soon will be critical components in data networking architectures.

Table 5: Product Categories

Product Category	Description
Broad Band Remote Access Controller	An access server without modems which has the ability to terminate PPP and route/switch the data based on domain
Terabit Router	A device that provides layer 3 routing/switching with 1 terabit or more of switching fabric or back plane capacity. (use smaller of the two as deciding factor)
Remote Access Concentrator	A device that provides modem functionality for 672 or more simultaneous dial up sessions in one chassis. (Not ISDN or 56/64k dedicated)
ATM Switch	A device that switches only ATM cells and with a back plane or switching capacity of 25Gbps or more
Gigabit Ethernet Switch	A device that switches gigabit Ethernet and with more than 30 GbE ports and 30Gbps back plane or switch capacity.
Caching Appliance	A caching server running on dedicated hardware and is not a software only solution
Load Balancer Appliance.	A load balancer running on dedicated hardware and is not a software only solution
Edge Router	An IP router that supports 100 or more T1 ports.
Firewall Appliance	An firewall appliance that supports 45Mbps or more of throughput

A table was generated (Appendix E) for each product category. Each table lists the category, definition, search descriptors and the candidate products as identified from the Internet search process.

5.1. List of products

From the nine product categories created, 101 products were identified as candidate products. Once additional research was performed on each product, the list was reduced to 53 qualifying products across the nine product categories (see Appendix F). The 53 qualifying products came from 40 companies:

- 27 private companies contributed 30 products
- 13 public companies contributed 23 products

5.2. Company Research

Each of the 40 companies was independently researched for data on their ownership (private/public), number of employees, headquarters, and year founded. For the purpose of this thesis only the number of employees was used in hypothesis testing. The results are shown in Appendix G.

5.3. Variable and Exploratory Data Analysis

Table 6 presents the samples, ranges, mean and standard deviations for the variables examined in the thesis. The number of employees in the organizations of the projects studied ranged from 3 up to 190,000 with the mean being 18,473.

News Release Variables:

The products studied had zero to ten news releases published during the Time to Availability period with a mean of 1.86. During the Customer Exposure period, anywhere from one to 11 news releases were published with a mean of 2.11. The products examined were priced from \$8k to \$80k with a mean of \$40k.

Time to Market Variables

The length of the TTA period ranged from zero days (product became available for sale on the same day as it was announced) to 273 days. The average had a TTA of 91 days.

CHAPTER 5 - RESULTS

The length of the CE period ranged drastically from 0 all the way up to 436 days. The average CE period was also 91 days

Table 6: Variable Analysis

Variable	Type	N	Minimum	Max	Mean	STD. Deviation
Number of Employees	Dependent	35	3	190000	18473.8	43642.06
News Releases published during the TTA period	Independent	35	0	10	1.86	2
New Releases published during the CE period	Independent	35	1	11	2.11	1.89
Product Price	Independent	35	\$8k	\$80k	\$40k	26.3
Length of TTA Period	Independent	35	0	273	91.14	75.81
Length of CE Period	Independent	35	0	436	91.17	109.12

All hypotheses were tested were using bivariate correlation. Examination of skewness and kurtosis (table 7) indicates that that most of the variables are not normally distributed, and suffer from long right tails. Since the data was not normal, Spearman was used to calculate the correlation coefficient. The direction of the expected result was indicated prior to the tests, therefore one-tailed tests were used.

Table 7: Variable Normality

Variable	Skewness		Kurtosis	
	Statistic	Std. Error	Statistic	Std. Error
Number of Employees	3.008	0.398	8.66	0.778
News Releases published during the TTA period	2.167	0.398	6.953	0.778
New Releases published during the CE period	3.398	0.398	14.324	0.778
Length of TTA Period	0.561	0.398	-0.227	0.778
Length of CE Period	1.355	0.398	1.554	0.778
Product Price	0.278	0.398	-0.985	0.778

5.4. Results of Hypotheses Tests

The following section lists the results from the hypotheses tests. For this section the following key should be used to understand the variables listed in the result tables.

Table 8: Variable Name Key for Result Tables

SIZE	Size of company (represented by number of employees)
NR_TTA	Number of news releases published during the Time to Availability period
NR_CE	Number of news releases published during the Customer Exposure period
NR_TA_RT	News release rate during the Time to Availability period
NR_CE_RT	News release rate during the Customer Exposure period
TTA	Time to Availability
CE	Customer Exposure

5.4.1. Company Size and News Releases Usage

The following two hypotheses examine product news releases to determine if there are relationships that exist between company size and the number of news releases published.

Hypothesis 1

The table below shows the bivariate correlation results relevant to hypothesis 1: *The number of news releases published during the Time to Availability period is negatively associated with the company size.*

Table 9: Hypothesis 1 Results

Correlations

			SIZE	NR_TTA
Spearman's rho	SIZE	Correlation Coefficient	1.000	-.019
		Sig. (1-tailed)	.	.456
		N	35	35
	NR_TTA	Correlation Coefficient	-.019	1.000
		Sig. (1-tailed)	.456	.
		N	35	35

CHAPTER 5 - RESULTS

The results show that no significant association was found between company size and the number of new releases in the Time to Availability period. Through further examination it was noticed that eight products, all belonging to relatively small companies, had a Time to Availability of zero, which indicates the company did not release any information about the product until it was ready to ship. If these eight samples are removed from the data and the hypothesis is tested against the remaining products (see table 9), we find that a significant correlation is found. Large companies publish fewer news releases per product in the Time to Availability period than small companies.

Table 10: Hypothesis 1 Results without zero Time to Availability products

Correlations			SIZE	NR_TTA
Spearman's rho	SIZE	Correlation Coefficient	1.000	-.406*
		Sig. (1-tailed)	.	.018
		N	27	27
	NR_TTA	Correlation Coefficient	-.406*	1.000
		Sig. (1-tailed)	.018	.
		N	27	27

*. Correlation is significant at the .05 level (1-tailed).

Hypothesis 2

The table below shows the bivariate correlation results relevant to hypothesis 2: *The number of news releases published during Customer Exposure period is negatively associated with the company size.*

Table 11: Hypothesis 2 Results

Correlations			SIZE	NR_CE
Spearman's rho	SIZE	Correlation Coefficient	1.000	-.441**
		Sig. (1-tailed)	.	.004
		N	35	35
	NR_CE	Correlation Coefficient	-.441**	1.000
		Sig. (1-tailed)	.004	.
		N	35	35

** - Correlation is significant at the .01 level (1-tailed).

CHAPTER 5 - RESULTS

There is a significant association between the company size and the number of news releases published during the Customer Exposure period. Large companies publish fewer news releases during the period than small companies.

5.4.2. Company Size and News Releases Rates

To remove any influence the duration of the time to market periods have on the number of news releases published, we normalized the number of news releases by dividing by the duration of the corresponding period to create a news release rate with the units of news releases per day.

Hypothesis 3:

The table below shows the bivariate correlation results relevant to hypothesis 3: *The news release rate during the time availability period is negatively associated with the company size.*

Table 12: Hypothesis 3 Results

Correlations

			SIZE	NR_TA_RT
Spearman's rho	SIZE	Correlation Coefficient	1.000	-.408*
		Sig. (1-tailed)	.	.017
		N	35	27
	NR_TA_RT	Correlation Coefficient	-.408*	1.000
		Sig. (1-tailed)	.017	.
		N	27	27

*. Correlation is significant at the .05 level (1-tailed).

The results from hypothesis 3 show that large companies publish fewer news releases per unit of time during the availability period than small companies.

CHAPTER 5 - RESULTS

Hypothesis 4:

The table below shows the bivariate correlation results relevant to hypothesis 4: *The news release rate during the Customer Exposure period is negatively associated with the company size.*

Table 13: Hypothesis 4 Results

Correlations			SIZE	NR_CE_RT
Spearman's rho	SIZE	Correlation Coefficient	1.000	-.028
		Sig. (1-tailed)	.	.449
		N	35	24
	NR_CE_RT	Correlation Coefficient	-.028	1.000
		Sig. (1-tailed)	.449	.
		N	24	24

The results show that no significant association was found between company size and the news release rate in the Customer Exposure period.

5.4.3. Company Size and Product Price

The following hypothesis examines product price as gathered from news releases to determine if relationships exist between company size (represented by the number of employees) and product price.

Hypothesis 5

The table below shows the bivariate correlation results relevant to Hypothesis 5: *The company size is positively associated with the price of the product*

Table 14: Hypothesis 5 Results**Correlations**

			EMPLOY	PRICE
Spearman's rho	EMPLOY	Correlation Coefficient	1.000	.456**
		Sig. (1-tailed)	.	.003
		N	35	35
	PRICE	Correlation Coefficient	.456**	1.000
		Sig. (1-tailed)	.003	.
		N	35	35

** . Correlation is significant at the .01 level (1-tailed).

The results show a positive correlation between company size and product price. Large companies produce more costly products than small companies.

5.4.4. Time to Market and Company Size

The following two hypotheses look for relationships that exist between product time to market and company size. Time to market is considered to be the sum of two variables: Time to Availability and Customer Exposure.

Hypothesis 6

The table below shows the bivariate correlation results relevant to hypothesis 6: *Time to Availability is negatively associated with the company size*

Table 15: Hypothesis 6 Results**Correlations**

			SIZE	TTA
Spearman's rho	SIZE	Correlation Coefficient	1.000	.219
		Sig. (1-tailed)	.	.104
		N	35	35
	TTA	Correlation Coefficient	.219	1.000
		Sig. (1-tailed)	.104	.
		N	35	35

The results show there is a no statistically significant correlation between company size and Time to Availability. Large companies require the same amount of time to bring their product to availability as small companies.

Hypothesis 7

The table below shows the bivariate correlation results relevant to hypothesis 7: *Customer Exposure is negatively associated with company size.*

Table 16: Hypothesis 7 Results

Correlations

			SIZE	CE
Spearman's rho	SIZE	Correlation Coefficient	1.000	-.311*
		Sig. (1-tailed)	.	.034
		N	35	35
	CE	Correlation Coefficient	-.311*	1.000
		Sig. (1-tailed)	.034	.
		N	35	35

*. Correlation is significant at the .05 level (1-tailed).

The results show that there is a significant association between company size and Customer Exposure. Large companies find their first customer for new products faster than small companies.

5.4.5. Market Window

There is the general opinion that if a vendor takes too long to release a product they will miss the market window and have difficulty selling the product.

Hypothesis 8

The table below shows the bivariate correlation results relevant to hypothesis 8: *Time to Availability is positively associated with Customer Exposure.*

Table 17: Hypothesis 8 Results

Correlations

			CE	TTA
Spearman's rho	CE	Correlation Coefficient	1.000	-.448**
		Sig. (1-tailed)	.	.003
		N	35	35
	TTA	Correlation Coefficient	-.448**	1.000
		Sig. (1-tailed)	.003	.
		N	35	35

** - Correlation is significant at the .01 level (1-tailed).

The results show that there is a significant negative association between Time to Availability and Customer Exposure. The longer a product takes to go to market, the shorter the time required to find a first customer.

6. Discussion of Results

This chapter provides additional discussion on the hypotheses results. Section 6.1 presents a summary of the results while sections 6.2 - 6.5 provide in-depth discussions. Section 6.6 examines the need for standardization and regulations around news releases. Section 6.7 describes the limitations of the research.

6.1. Discussion of Results

This research is the first empirical study on the relationships between company size, news releases and time to market. Unlike other time to market studies, this thesis expands the definition of time to market to include the time required to find the first customer. In addition, this research provides a repeatable process to collect time to market data without direct contact with organizations. This provides an “outside-in” view of the company providing data that is not subject to the opinions and attitudes of the employees of the corporation. Eight hypotheses were developed from literature on time to market, competitive analysis, advertising and business-to-business marketing. They were tested using a sample of 53 new products from data communications companies. In summary, the results show the following:

First, the data suggests there is a tendency for small companies to only release product information when the product is available for customer sale. For companies that release product information before the product becomes available, it has been shown that:

- Compared to small companies, large companies publish fewer news releases per product.
- Compared to small companies, large companies publish fewer news releases per product per unit of time during the time to availability period.

These results indicate that large companies do not use or value news releases in the same way as small companies.

CHAPTER 6 - DISCUSSION OF RESULTS

Second, the results indicate that large companies develop more costly products than small companies. This suggests that large companies take advantage of their larger resource assets to develop products that cannot be adequately delivered by smaller, resource constrained companies.

Third, in terms of time to market, the results indicate company size is not related to the time required to produce a product. If Customer Exposure is examined the results indicate that large companies can find their first customer faster than small companies.

Fourth, the results indicate that the longer it takes to develop a product, the shorter the time required to find the product's first customer. This suggests that the market for a new product develops slowly, which permits late entrants to find customers as fast as early entrants.

6.2. News Releases Usage and Company Size

From the 32 products studied, it was observed that eight of the products did not release information until the product was available for purchase. Six of the eight products were from companies with less than 180 employees. This indicated there is a tendency for small companies to not release product information until the product is available for sale. This may be because the organizations do not understand the value of news releases or it may be a method of protecting intellectual property until the product is ready for sale.

If the above mentioned eight products are considered to be outliers and are removed from the test, the results indicate that large companies do not use or value news releases to the same degree as small companies. During the TTA period, smaller companies publish more news releases at a fast rate than large companies. This supports the thought that startups take full advantage of news releases to promote their product and company. By publishing more news releases per product, small companies may hope to:

- Attract new employees
- Attract venture capital

CHAPTER 6 · DISCUSSION OF RESULTS

- Create market momentum to increase capital through an IPO or existing market stock

During the Customer Exposure period, small companies continue to publish more news releases than large companies. This supports the notion that large companies rely on their sales and marketing resources to find customers. Small companies with limited sales and marketing resources use news releases as part of their marketing strategy in an attempt to reduce the technical uncertainty that exists with their product.

6.3. Product Cost and Complexity

The results indicate that large companies develop more costly products than small companies. The higher cost may also indicate the product is more complex in nature. This could be for the following reasons:

- 1) Large data communications companies typically have large “carrier class” customers that offer services to a great number of customers. This environment historically requires complex, scalable systems with advanced redundancy and management capabilities.
- 2) Large companies are proactively using their resource advantages to develop products that cannot be offered by small companies.

With the emergence of new competitive service providers, traditional network topologies are changing to a more distributed nature where large, centralized, complex products are being replaced with smaller distributed products at the edge of the network. This fact may force large companies to reevaluate how they use their resource advantages.

6.4. Time to Market and Company Size

Product Development

Large companies are thought to have greater access to resources and larger R&D budgets and therefore should have shorter product development times. Hypothesis 5 shows that there was no significant association found between company size and the Time to Availability however, there was a statistically insignificant trend suggesting that large companies take longer to develop products than small companies. If one believes that large companies produce more costly and complex products as confirmed in hypothesis 5, it makes sense that the products would take longer to develop. Historically, large companies may have had resource advantages, but today the environment is different due to two factors:

1) Increased use of outsourcing:

Today small product development companies have at their disposal a wide range of companies specialized in providing design and manufacturing services. This gives the small company the virtual resources they need to quickly design and produce products.

2) Capital Availability:

The venture capital opportunities for small companies are greater than at any time in history. This combined with the trend to IPO a company early has created large amounts of capital that can be used by small companies to purchase design and development services.

The increased use of outsourcing combined with the amount of capital available has created an environment where small companies can produce products as fast as large companies.

Product Marketing

It has been said that marketing is war, and therefore the larger company will win the marketing battle [5]. The results of hypothesis 7 support this statement by suggesting that large companies find their first customer for new products faster than small companies. This association may exist for three reasons:

- **Limited channels to market:** Small companies are typically start-ups and therefore do not have the existing channels to market or customer relationships that may exist in larger organizations.
- **Limited Track Record:** Small companies are looked upon as inherently unreliable and not necessarily dependable due to their limited track record in the industry. Large customers often recommend that small companies team with larger companies to ensure an adequate support infrastructure is available behind the product.
- **Hesitancy or difficulty in outsourcing marketing:** Marketing, unlike design and development, is not typically outsourced. Because of this, small companies with five marketing staff have to compete head to head with large companies with hundreds of marketing professionals.

While large and small companies can compete head to head through development and design, large companies have strength in sales and marketing that small companies cannot match today.

6.5. Market Window

It has been said that late products will miss their market window and therefore will be difficult to sell. The results from hypothesis eight conclude that the longer a product takes to develop the shorter the time it takes to find a first customer. The Chasm model developed by Geoffrey Moore can be used to explain why this occurs [12].

Products that are released early in the product life cycle will encounter the demand generated by the innovator and early adopter segments. Innovators are drawn to new technologies and are often willing to take product risks, but unfortunately they usually have limited capital. Early adopters are the next segment to take notice of new products. They want to exploit new technologies and usually have the capital to purchase innovative products. However, this segment is often niche focused and therefore has small markets. The third customer segment in the product life cycle is the early majority. This segment makes the bulk of technology purchases and often looks for strong references from people they trust. Therefore, even if a product is released late, and misses the first two customer segments, it has the potential to arrive during the early majority phase when the bulk of products are purchased. This model may explain why products that take the longest to develop have the shortest Customer Exposure.

On a side note, a short time to first customer is not necessarily a measure of product success. Having a short development cycle and a faster time to market provides advantages such as increased market share, improved margins, reduced switching costs for customers etc.

6.6. Standardization and Regulation of News Releases

The purposes of news releases are to generate publicity and provide information to potential customers. In addition, this information is also used by other businesses for insight into the products and strategy of their competitors.

Financial results are one of the 19 types of information identified that consistently appears in product news releases. Public U.S companies must report financial figures to the Securities and Exchange Commission in accordance with the Securities Exchange Act. Unlike financial figures, there is no regulatory body to enforce the accuracy of the other 18 types of data appearing in product news releases. Products are the lifeblood of high technology companies. There is evidence to show that product news releases can have a significant impact on stock valuations, yet there is no guarantee that the information released is correct. Through this research, examples have been found where products disappear from existence, availability dates have slipped drastically and partnerships have been announced which have not produced any observable results. The lack of regulations in this area creates an environment where companies could potentially disrupt the market with unclear or exaggerated news releases.

6.7. Limitations of Research Approach

First, the sample size remained limited due to time considerations. Out of 53 products researched, a large number had not indicated a customer, reducing the usable sample size significantly.

Second, the conclusions rely heavily on the assumption that the variables used are adequate proxies for the real measures. For example, time to product availability is being used as a proxy for product development duration. First news release date is being used as a proxy for the start of product development.

Third, the research presented has been largely exploratory in nature because there is very little published material on the topic of news releases and their relationship with product time to market. Since there are limited theories upon which to build, a substantial part of the research effort was focused on producing a consistent framework for collecting news release data. The statistical analysis and hypotheses used were simple bivariate tests that will hopefully spawn new questions and theories requiring multivariate tests.

REFERENCES

References

- [1] Prescott, J. Grant, J. 1988. A Managers Guide for Evaluation Competitive Analysis Techniques. Interfaces, 18, no. 3. The Institute of Management Science
- [2] Bradley, Hausman, Nolan. 1993. Globalization, Technology, and Competition, DLC
- [3] What is a Press Release. Charles Kessler and Associates; http://www.net-market.com/proactive_marketing.htm
- [4] Richter, Jake. 1995. The Press Release A Garage Entrepreneur: CAD++ <http://www.richterscale.org/garage/garent-5.htm>
- [5] Ries, Trout. 1994. The 22 Immutable Laws of Marketing. Harper Business
- [6] Ries, A. Ries, L. 1998. The 22 Immutable Laws of Branding Harpercollins
- [7] Vakratsas, D. Ambler, T. 1999. How Advertising Works: What Do We Really Know. Journal of Marketing Vol. 63. 26-43
- [8] Sommers, Barnes, Stanton, Futrell. 1989. Fundamentals of Marketing. 5th Canadian Addition, McGraw-Hill Ryerson Limited
- [9] Rangan, Shapiro, Moriarty Jr. 1994. Business Marketing Strategy. Mcgraw-Hill
- [10] Bordan, K. 1994. Bullet Proof News Releases , Franklen Sarrett
- [11] Farrell, A. Competitive Intelligence Basics. Woodlawn Marketing Services <http://www.worksys.com/ci101.htm>
- [12] Moore, G. 1998. The Gorilla Game. Harper Business
- [13] Kotler, P. 1999. Kotler on Marketing. The free Press.
- [14] Smith, Preston G.. Reinerstsen, D. 1991. Developing Products in Half the Time. Van Nostrand Reinhold
- [15] Fine, C. 1999. Clock Speed. Perseus Books

Appendix: A News Release Messages

The following table describes the types of messages frequently found in news releases.

Category	Description
1. Debut	First ever mention of the product.
2. Financing	Information that notes investment, funding or financing received by the company.
3. Awards	Information that mentions an award the product has received or the placement the product has received in an award category.
4. Tradeshow	Information noting the product will be shown at a trade show.
5. Demo	Information indicating the product will be in a demo.
6. Vision	Information on the company's vision or indication that the companies vision will be explained at an event.
7. Named Only	The product is named without any detail given to its functionality.
8. Innovation	Information noting new features or new technology integrated into the product. Innovation must be an upgrade to the existing product and does not create a new platform.
9. Interoperability	Information noting interoperability testing between the product and some other vendor's equipment.
10. Partnership	Information regarding investment in the products development in the form of IP or money that will aid in advancing the product. Can also be in the form of joint marketing agreements
11. Analyst comments	Comments from industry analysts that mention the product specifically. Also includes comment from VC firms.
12. Customer: Plans to deploy	Information indicating that the customer has selected the product and is planning to deploy the product.
13. Customer: Deployment	Information indicating that the customer has deployed the product.
14. Customer: In service	Information indicating that the product is in service in the customer's network.
15. Customer: Comments	Comments from the customer with respect to the product.
16. Customer: Testing	Information indicating that the customer performed testing on the product.
17. Other Testing	Information indicating that someone other than the customer performed testing on the product
18. Beta Availability	Information noting the product availability for beta use. Must use the word beta in the release.
19. Customer Availability	Information noting the date when the product will be available for customer use.

Appendix: B   Customer Affect Models [7]

1) Market Response Model

Purchasing behavior is related to advertising, price, and promotional measures

2) Cognitive Information Models

Advertising does not change the consumer preferences. Consumer decisions are rational.

3) Pure Affect Models

Consumer preference depends on the familiarity and feelings evoked by the advertisements. The product becomes linked to feelings, and emotions.

4) Persuasive Hierarchy Models

A hierarchy exists that must be performed in order for success. The consumer must be informed and then persuaded, but only in that order.

5) Low involvement Hierarchy Models

The consumer preference is largely affected by experience with the product.

6) Integrative Model

Frequently purchased products: Low involvement and affect motivated.

Infrequently purchased products: For high involvement products, for which trial is risky or expensive, higher order beliefs are formed immediately but they need not be based exclusively on advertising. External information sources (word of mouth, magazine articles) and prior experience should affect the higher order beliefs. The effect of advertising may not be strong.

7) Hierarchy Free Models

The Hierarchy free model is the smallest category. It suggests that advertising is part of a brand totality.

Appendix: C   News Releases and Technical Uncertainty [9]

1) Will the new product function as promised?

- The following message types can be used to suggest that the product will function as promised;
  - Demos
  - Analyst Comments
  - Customer Comments
  - Customer Testing
  - Other testing

2) Will the Delivery timetable be met?

- Interoperability: Show the product is far enough in design to be tested
- Customer testing, Other testing: Shows the product is close to completion
- Beta availability: Shows that the beta version is ready
- Customer availability information describe when the product can be tried or purchased.

3) Will the vendor give High-Quality Service?

- Awards
- Partnerships
- Interoperability
- Analyst Comments
- Customer testing, Other testing

4) Will there be side effects of the product or service?

- Customer Testing, Other Testing

5) Will new technology make ours obsolete?

- Unclear if news releases address this uncertainty.

One area that causes technical uncertainty that is not mentioned above is the lack of information on the product. To address this uncertainty, trade shows can provide a forum to educate potential customers.

Appendix: D Competitive Analysis Technique Evaluation

To compare the applicability of news releases as a competitive analysis technique, the 10 evaluation dimensions outlined in Prescott and Grant [1] were applied to news releases.

#	Dimension	Options	News release fit for Dimension
1	Time	Development	Short The development time consists of determining the objectives and constraints of the analysis.
		Execution	Short-Moderate - Depending on the number of news releases to be examined, the execution time can be short to moderate in duration. - The development time is short and the execution time is flexible depending on the depth of analysis wanted.
2	Financial Resources	Low News releases are freely available.	

3	Managerial Skill	Technical	Required at a depth necessary to understand factors in the news releases.
		Interpersonal	Low requirement Limited interpersonal contact required
		Conceptual and Diagnostic	Low-High Depending on the type of analysis, the implications of the news release messages may or may not be obvious.
		Analytic	High Required to determine the key variables to be studied in the analysis and to understand the interrelationship when analyzing the results.

APPENDIX D-COMPETITIVE ANALYSIS EVALUATION

4	Sources	- Because news releases contain information specific to the area of interest, they can be considered as "target sources" which provide the greatest amount of useful information in the shortest period of time. - The advantage of news releases over other target sources is that they are not one-shot sources and can be revisited and continually updated. - News releases are different because they can be considered a target source and are available like library sources. News releases can fill the "target-library" void that was shown in the Prescott-Grant paper.
5	Availability	The data in news releases is available in the raw so is considered to be "derived from analysis". The raw data can be processed as needed
6	Timeliness	News releases offer several advantages over other competitive information sources. Not only do they provide historical data, they also provide data on the future through messages of company vision, future products, and strategies.

7	Accuracy	• Accuracy of the data is dependent on the amount of managerial skill required to obtain the information needed. • Conceptualizing, diagnosing and analyzing is partly subjective and will create some error in the data.	
8	Updating Requirements	Frequency	• The analysis can be updated "ad hoc"[1] when the need arises because the information will be archived and freely available at any time.
		Difficulty	• New news releases can be accessed very easily.
9	Advantages		• Usefulness will increase. as more information becomes availability on the web.
10	Limitations		• Possible loss of news releases due to acquisitions. • News releases are very different than other competitive intelligence information. They fit into a category that no other sources fit. Because the company publishes the news releases, the information is widely available, free of charge, and specific.

Appendix: E   Product Categories

The following 9 tables outline the product categories created in the study.

Table 1: Broadband Remote Access Concentrator

Broad Band Remote Access Concentrator				
An access server without modems which has the ability to terminate PPP and route/switch the data based on domain				
1) Service selection + ADSL 2) Broadband RAS 3) Subscriber Management + ADSL				
Source	Company	Product	Specs	Qualify
Techweb	Cisco	SMS1000	4000 sessions 20 contexts	y
Techweb	PulseCom	Dynamic connect, Broadband SAM .	3072 sessions	y
AltaVista	Newbridge	6510 Service Selection Gateway	L2TP PPP term via 6400	y
AltaVista	Alcatel	AXI510	2,000 PVCs PPP L2TP	y
AltaVista	AG Communications	ATIUM Gateway	Client, web based provisioning	n
AltaVista	Ericsson	Data Application Network Adaptor	PPP over ATM	y
AltaVista	Redback	Service Subscription Manager	PPP PPP over ATM L2TP	y
AltaVista	Assured Access	Broadband RAS	40,000 session	y
AltaVista	Westell	No product		n
AltaVista	3Com	No product		n
AltaVista	Efficient	No product		n

APPENDIX E-PRODUCT CATEGORIES

Table 2: Terabit Router

Terabit Router				
A device that provides layer 3 routing/switching with 1 terabit or more of switching fabric or back plane capacity. (use smaller of the two as deciding factor)				
1) terabit router				
2) terabit switch				
Source	Company	Product	Specs	Qualify
Techweb	Argon Networks	Giga Packet Node	160Gbps Non blocking backplane	No
Techweb	Avici System	Terabit Switch Router (TSR)	2.5Gbps - 5.6Tbps	Yes
Techweb	Juniper Networks	M40 Internet Backbone Router	40 Gbps backplane	No
Techweb	Neo Networks	Stream Processor 2400	512Gbps switch fabric	No
Techweb	Nexabit Networks	NX64000 Multi-Terabit Switch Router	6.4 Tbps	Yes
Techweb	NetCore Systems	Everest integrated switch	2.5Gbps switching fabric	Yes
Techweb	Pluris	Terabit Network Router (TNR)	"multi tbps"	Yes
Techweb	Torrent	IP9000 Gigarouter	20 Gbps	No
Previous Research	Cisco	GSR12000	60Gbps	No
Previous Research	Ascend	GRF1600	16Gbps	No
Previous Research	Lucent	Packetstar 6416	128Gbps Backplane. 64Gbps Switch fabric	No

APPENDIX E-PRODUCT CATEGORIES

Table 3: Remote Access Concentrator

Remote access Concentrator				
A device that provides modem functionality for 672 or more simultaneous dial up sessions in one chassis. (Not ISDN or 56/64k dedicated)				
1) remote access concentrator				
Source	Company	Product	Specs	Qualify
TechWeb	Lucent	Portmaster 3	60 ports	No
DejaNews	Lucent	Portmaster 4	864 Ports	Yes
TechWeb	Shiva	LAN rover Access Switch	120 ports	No
TechWeb	Aptis (Nortel)	CVX1800	1344 ports	Yes
TechWeb	Bay Networks (Nortel)	V5399 RAC Module	56/62 * 12 slots=576 / 744	Yes
DejaNews	Cisco Systems	AS5800	10slots*72=720	Yes
DejaNews	ACC (Ericsson)	Tigris (11 slot)	1,344	Yes
DejaNews	Ascend (Lucent)	Max TNT	24/30 * 14slots = 336/420 ports	No
DejaNews	3com/USR	Total Control Multiservice Access Platform	288 ports	No
Previous Research	Assured Access	X1600	832 ports	Yes

Table 4: ATM Switch

ATM Switch				
A device that switches only ATM cells and with a back plane or switching capacity of 25Gbps or more				
1) Core ATM switch				
Source	Company	Product	Specs	Qualify
Techweb	Newbridge	Main Street 6190	Up to 1 Tbps	y
Techweb	Cisco	Catalyst 8500 Multiservice ATM switch	40 Gbps	y
Techweb	Fore	Forerunner ASX-4000	40 Gbps	y
AltaVista	Ascend	GX550	25 Gbps	y
AltaVista	Alcatel	Alcatel 1000 BBX	32-1.6Tbps	y
AltaVista	Nortel	Concorde/Vector		n
AltaVista	Lucent	GlobeView2000	160Gbps	y
AltaVista	Bay	Centillion		n
AltaVista	3Com	PathBuilder		n
Altavista	Ericsson	AXD301	10 Gbps to 160 Gbps	y

APPENDIX E-PRODUCT CATEGORIES

Table 5: Gigabit Ethernet Switch

Gigabit Ethernet Switch				
A device that switches gigabit ethernet and with more than 30 GbE ports and 30Gbps backpane or switch capacity.				
1) Gigabit Ethernet Switch				
Source	Company	Product	Specs	Qualify
TechWeb	Allied Telesyn		8 ports	-
TechWeb	Foundry	Big Iron	64 ports/128G switch	y
TechWeb	Extreme	Black Diamond	48/64G switch	y
TechWeb	Acclaim		Cannot access	-
TechWeb	Bay	Accelar 8000	128/50-256G switch	y
TechWeb	Prominet (Lucent)	Cajun P550	24/22.8G switch	-
TechWeb	3COM	Core Builder 9000	24	-
TechWeb	Xylan	Omni Switch Router	32/22G	-
TechWeb	HP	Procurve Routing Switch 9308	64/256Gbps	y
AltaVista	Cisco	Catalyst 6500	130/32-256	y
AltaVista	Galileo			-
AltaVista	Plaintree	Wave Switch9200	16/32	n
AltaVista	XLNT	Millennium 4000	36/40G	y
AltaVista	Packet Engines	Powerrail 5200	25/52G	n
Other Research	Fore	ESX-4800	48/40G	y

Table 6: Caching Appliance

Cache Appliance				
A caching server running on dedicated hardware and is not a software only solution				
1) Cache Server				
Source	Company	Product	Specs	Qualify
Techweb	Cacheflow	Cacheflow...	Appliance	y
Techweb	Cisco	Cache Engine	Appliance	y
Techweb	CSM-USA		Proxy Server	n
Techweb	Deerfield		Proxy Server	n
Techweb	Entera	Teranode Cache	Appliance	y
Techweb	Eolian Inc.	Infostorm	Appliance...S/W	n
Techweb	IBM	Webcach Manager	Appliance	y
Techweb	InfoLibria	Dynacache	Appliance	y
Techweb	Inktomi		Appliance S/W	n
Techweb	Microsoft		Proxy Server	n
Techweb	Netscape Communications		Proxy Server	n
Techweb	Network Appliance	Netcache	Appliance	y
Techweb	Novell Inc.		Proxy Server	n
Techweb	Ositis		Proxy Server	n
Techweb	Packet Storm	WebSpeed	Appliance...No info	n

APPENDIX E: PRODUCT CATEGORIES

Table 7: Load Balancer

Load Balancer				
A load balancer running on dedicated hardware and is not a software only solution.				
1. Load Balancer				
Source	Company	Product	Specs	Qualify
Techweb	F5Labs	BigIP	No Debut PR	n
Techweb	Alteon	Ace Director		y
Techweb	Foundry	Server Iron		y
Techweb	Cisco	Local Director		y
Techweb	Radware	Web Server Director	No Debut PR	n
Techweb	ArrowPoint	CS100/800	Server management	n
Techweb	Bright Tiger	Cluster Cats	S/w	n
Techweb	Holon Tech	Hyperflow 800/1600		y
Techweb	Hydra Web	900/2000/5000		y
Techweb	Resonate	Central dispatch	S/w	n
Techweb	Coyote Point	Equalizer		y

Table 8: Edge Router

Edge Router				
An IP router that supports 100 or more T1 ports.				
1. Edge router				
2. Aggregation router				
Source	Company	Product	Specs	Qualify
Techweb	Shasta	Subscriber service system	No info available	n
Techweb	Redstone	Rx1400	4000ft1	y
Techweb	Transmedia		Over 100 ds-3	y
Techweb	Ennovate	Envoy1600	100 T1	y
Techweb	Bay	V15000	672 Ds-1/24 DS-3	y
Techweb	Torrent(ericsson)	IP 9520	60 ds-3	y
Techweb	Xylan		64 fT1	n

APPENDIX E-PRODUCT CATEGORIES

Table 9: Firewall Appliance

Firewall Appliance				
An firewall appliance that supports 45Mbps or more of throughput				
1) Firewall appliance				
Source	Company	Product	Specs	Qualify
Techweb	Internet Devices	F10K	100Mbps – no other info	n
Techweb	Fortress Technology		70Mbps	y
Techweb	VPNNetworks		90Mbps	y
Techweb	Cisco		170Mbps	y
Techweb	Watchguard Technologies		FireboxII	y
Techweb	Rampnet		small	-
Techweb	Technologic		small	-
Techweb	Radguard		100Mbps-no customer	n
Techweb	Sonic Systems		T3-new no customer	n
Techweb	NetScreen		84Mbps	y
Techweb	Lucent		No info	-

APPENDIX F-QUALIFIED PRODUCTS

Appendix: F List of Qualified Products

Category	Vendor	Product Name
Broadband Remote Access Concentrator		
1	Assured Access	Broadband RAS
2	Redback	Service Subscription Manager
3	PulseCom	Dynamic connect. Broadband SAM.
4	Newbridge	6510 Service Selection Gateway
5	Ericsson	AXI510
6	Alcatel	Data Application Network Adaptor (DANA)
7	Cisco	6510 Service Selection Gateway
Tera-Bit Router (4)		
1	Pluris	Terabit Network Router (TNR)
2	Nexabit Networks	NX64000 Multi-Terabit Switch Router
3	Avici System	Terabit Switch Router (TSR)
4	NetCore Systems	Everest integrated switch
Remote Access Concentrator (6)		
1	Livingston	Portmaster 4
2	Aptis	CVX1800
3	Cisco Systems	AS5800
4	Bay Networks	V5399 RAC Module
5	ACC	Tigris (11 slot)
6	Assured Access	X1600
ATM Switch (7)		
1	Newbridge	Main Street 36190

APPENDIX F-QUALIFIED PRODUCTS

2	Cisco	Catalyst 8500 Multiservice ATM switch
3	Fore	Forerunner ASX-4000
4	Ascend	GX550
5	Alcatel	Alcatel 1000 BBX
6	Lucent	Globeview2000
7	Ericsson	AXD301
Gigabit Ethernet Switch (7)		
1	Foundry	Big Iron
2	Extreme	Black Diamond
3	Nortel	Accelar 8000
4	HP	Procurve Routing Switch 9308
5	Cisco	Catalyst 6500
6	XLNT	Millennium 4000
7	Fore	ESX-4800
Caching Appliance (6)		
1	Cacheflow	Cacheflow...
2	Cisco	Cache Engine
3	Entera	Teranode Cache
4	IBM	Webcach Manager
5	InfoLibria	Dynacache
6	Network Appliance	Netcache
Load Balancer (6)		
1	Alteon	Ace Director
2	Foundry	Server Iron
3	Cisco	Local Director

APPENDIX F-QUALIFIED PRODUCTS

4	Holon Tech	Hyperflow 800/1600
5	Hydra Web	900/2000/5000
6	Coyote Point	Equalizer
Edge Router (5)		
1	Redstone	Rx1400
2	Transmedia	
3	Ennovate	Envoy1600
4	Bay	V15000
5	Torrent	IP 9520
Firewall (5)		
1	Fortress	VPN-100
2	VPNet	VSU-1100
3	Cisco	Cisco PIX
4	Watchguard	Firebox II
5	Netscreen	Netscreen-100

Appendix: G Private Companies

1. ACC

Company Name	ACC (Advanced Computer Com.)	www.acc.com
Ownership	Private	www.acc.com
Head Quarters	Santa Barbara, CA	www.acc.com
Founded	1991	www.acc.com
Number of employees	200	www.acc.com

2. Alteon Web Systems

Company Name	Alteon Web Systems	www.alteon.com
Ownership	Private	
Head Quarters	San Jose Ca	
Founded	May 1996	
Number of employees	108	

3. Aptis

Company Name	Aptis	www.aptis.com
Ownership	Private (Acquired by Nortel 1998)	
Head Quarters	Chelmsford, MA (978)-250-3888	
Founded	1997	
Number of employees	50	Press Release March 18,1998

APPENDIX G-PRIVATE COMPANIES

4. Assured Access

Company Name	Assured Access	URL:www.assuredaccess.com
Ownership	Private	URL:www.assuredaccess.com
Head Quarters	Milpitas CA, 408-941-1800	URL:www.assuredaccess.com
Founded	September 1996	URL:www.assuredaccess.com
Number of employees	85	telephone March 4, 1999

5. Avici Systems

Company Name	Avici Systems	www.avici.com
Ownership	Private	www.avici.com
Head Quarters	North Billerica, MA 978-964-2000	www.avici.com
Founded	1996	www.avici.com
Number of employees	80	OneSource

6. Cacheflow

Company Name	CacheFlow	www.cacheflow.com
Ownership	private	
Head Quarters	Sunnyvale Ca 408.220.2200	
Founded	1996	
Number of employees	70	

7. Coyote Point

Company Name	Coyote Point	www.coyotepoint.com
Ownership	Private	
Head Quarters	Sunnyvale Ca	
Founded	1995	
Number of employees	3	Telephone April, 27

APPENDIX G-PRIVATE COMPANIES

8. Ennovate Networks

Company Name	Ennovate Networks	www.ennovatenetworks.com
Ownership	Private	
Head Quarters	Boxborough MA 01719 978.263.2002	
Founded	1997	
Number of employees	50	

9. Entera

Company Name	Entera Inc.	www.entera.com
Ownership	Private	
Head Quarters	Pleasanton Ca 925.730.2200	
Founded	1997	
Number of employees	15	Phone April 29

10. Extreme

Company Name	Extreme Networks	www.extreamnetworks.com
Ownership	Private	
Head Quarters	Santa Clara Ca 888-257-3000	
Founded	1996	
Number of employees	180	

APPENDIX G-PRIVATE COMPANIES

11. Fortress Technology

Company Name	Fortress Technology	www.fortresstech.com
Ownership	Private	
Head Quarters	Tampa FL 813-288-7388	
Founded	1995	
Number of employees	35	Phone May 4, 1999

12. Foundry Networks

Company Name	Foundry Networks	www.foundrynetworks.com
Ownership	Private	
Head Quarters	Sunnyvale Ca 888.887.2652	
Founded	1996	
Number of employees	75	Telephone April 27, 1999

13. Holon Technology

Company Name	Holon Technology	www.holontech.com
Ownership	Private	
Head Quarters	San Jose Ca 408.369.4600	
Founded	1996	
Number of employees	65	

14. Hydraweb Technology

Company Name	Hydraweb Technology	www.hydraweb.com
Ownership	Private	
Head Quarters	Ny, Ny 212.809.5900	
Founded	1996	
Number of employees	29	

APPENDIX G-PRIVATE COMPANIES

15. Infolibria

Company Name	www.infolibria.com	
Ownership	Private	
Head Quarters	Waltham Mass 800.778.2111	
Founded	1997	
Number of employees		

16. Livingston

Company Name	Livingston Enterprises	www.livingston.com
Ownership	Private (Acquired by Lucent December 16, 1997)	
Head Quarters	Pleasanton, Ca. 1-800-458-9966	
Founded	1986	
Number of employees	250 December 1997 (400 now)	Telephone March 25, 1999

17. NetCore Systems

Company Name	NetCore Systems	www.netcoresys.com
Ownership	Private	www.netcoresys.com
Head Quarters	Wilmington MA. 978-694-1555	www.netcoresys.com
Founded	October, 1996	www.netcoresys.com
Number of employees	50	telephone March 5, 1999

18. Netscreen

Company Name	Netscreen Technologies	www.netscreen.com
Ownership	Private	
Head Quarters	Santa Clara 408-330-7800	
Founded	1997	
Number of employees	50	Telephone: May 4, 1999

APPENDIX G-PRIVATE COMPANIES

19. Nexabit Networks.

Company Name	Nexabit Networks	www.nexabit.com
Ownership	Private	www.nexabit.com
Head Quarters	Marlborough MA, 508-460-3355	www.nexabit.com
Founded	January 1998	Telephone, March 5, 1999
Number of employees	150	Telephone, March 5, 1999

20. Pluris Terabit Network Systems

Company Name	Pluris Terabit Network Systems	www.pluris.com
Ownership	Private	
Head Quarters	Cupertino CA 408-863-9920	
Founded	1996	Red Herring (www.redherring.com)
Number of employees	10	Red Herring March 1998

21. Redback Networks

Company Name	Redback Networks	URL:www.redbacknetworks.com
Ownership	Private	URL:www.redbacknetworks.com
Head Quarters	Sunnyvale Ca, 408-548-3500	URL:www.redbacknetworks.com
Founded	1996	URL:www.redbacknetworks.com
Number of employees	130	telephone Feb.25, 1999

22. Redstone Communications

Company Name	Red Stone Communications	www.redstonecom.com
Ownership	Private Siemens: PTA-March18, 1999	www.redstonecom.com
Head Quarters	Westford MA 01886 978.692.1999	www.redstonecom.com
Founded	Sept, 1997	www.redstonecom.com
Number of employees	85	Phone April 26, 1999

23. Transmedia Communications

Company Name	Transmedia Communications	www.trsmmedia.com
Ownership	Private	
Head Quarters	SanJose CA. 95119 408.363.8988	
Founded	1988	
Number of employees	60	Phone: April 26, 1999

24. Torrent Networking

Company Name	Torrent Networking	www.torrentnet.com
Ownership	Private Ericsson: AQ:April 13	
Head Quarters	Silverspring. Mayland 301.586.8200	
Founded	1996	
Number of employees	80	

25. VPNet

Company Name	VPN Technology Inc	www.vpnet.com
Ownership	Private	
Head Quarters	San Jose Ca 888.876.3888	
Founded	1995	
Number of employees	65	Telephone: May 4, 1999

26. Watchguard

Company Name	Watchguard Technologies Inc	www.watchguard.com
Ownership	Private	
Head Quarters	Seattle Washington 206-521-8340	
Founded	1996	
Number of employees	130	Telephone: May 4, 1999

APPENDIX G-PRIVATE COMPANIES

27. XLNT

Company Name	XLNT	www.xlnt.com
Ownership	Private (intel)	
Head Quarters	San Diego Ca 800.956.8638	
Founded	1989	
Number of employees	55	Telephone April 29

APPENDIX G-PRIVATE COMPANIES

Appendix: H Public Companies

28. Ascend

Company Name	Ascend Communications Inc.	www.ascend.com
Ownership	Public (Lucent)	
Head Quarters	Alameda Ca 510.769.6001	
Founded	1989	
Number of employees	3060	10-k 1999

29. Alcatel

Company Name	Alcatel	www.alcatel.com
Ownership	Public	www.alcatel.com
Head Quarters	Paris France, 33 1 40 76 10 10	www.alcatel.com
Founded	1898	20F Dec31,1997
Number of employees	190,000, 73,900	20F Dec31,1997

30. Bay Networks

Company Name	Bay Networks	www.baynetworks.com
Ownership	Public (Acquired by Nortel 1998)	www.baynetworks.com
Head Quarters	Santa Clara . Ca	www.baynetworks.com
Founded	1985	One Source
Number of employees	7,500	One Source

APPENDIX G-PRIVATE COMPANIES

31. Cisco Systems

Company Name	Cisco	www.cisco.com
Ownership	Public	www.cisco.com
Head Quarters	San Jose Ca. 408-526-4000	www.cisco.com
Founded	1984	Onesource
Number of employees	15000 (6.3k sls&m)	10K

32. Ericsson (Telefonaktiebolaget LM Ericsson)

Company Name	Ericsson	www.ericsson.com
Ownership	Public	www.ericsson.com
Head Quarters	Stockholm Sweden. 46 8 719 0000	www.ericsson.com
Founded	1918 Ltd	One source
Number of employees	103,667	98Report 12/31/98

33. Fore

Company Name	Fore Systems Inc.	www.fore.com
Ownership	Public	
Head Quarters	Warrendale PA 724-742-4444	
Founded	1990	
Number of employees	1,592	10-K. 1998

34. Hewlett Packard

Company Name	Hewlett Packard	www.hp.com
Ownership	Public	
Head Quarters	Palo Alto Ca	
Founded	1939	
Number of employees	124,600	

APPENDIX G-PRIVATE COMPANIES

35. IBM

Company Name	IBM	www.ibm.com
Ownership	Public	
Head Quarters	Armonk NY 914-499-1900	
Founded	1911	
Number of employees	291,067	

36. Lucent Tech,

Company Name	Lucent Technologies	www.lucent.com
Ownership	Public	
Head Quarters	Murryhill NJ	
Founded	1925	
Number of employees	150,504	OneSource

37. Network Appliance

Company Name	Network Appliance	www.networkappliance.com
Ownership	Public	
Head Quarters	Santa Clara CA	
Founded	1992	
Number of employees	450	10-K (1998)

38. Newbridge Networks

Company Name	Newbridge Networks	URL:www.newbridge.com
Ownership	Public	URL:www.newbridge.com
Head Quarters	Kanata On, 613-591-3600	URL:www.newbridge.com
Founded	1996	10K 4/30/98
Number of employees	6336	10K 4/30/98

APPENDIX G-PRIVATE COMPANIES

39. Nortel Networks

Company Name	Nortel Networks	URL:www.nortelnetworks.com
Ownership	Public	
Head Quarters	Brampton Ont.	
Founded	1914	OneSource
Number of employees	75,000	

40. PulseCom

Company Name	PulseCom	URL:www.pulse.com
Ownership	Subsidiary of Hubbell	URL:www.pulse.com
Head Quarters	Tulsa OK, 918-252-1578	URL:www.pulse.com
Founded	1909 (Inc.), 1958	Web Page. Once Source
Number of employees	8,801, 350	10K. OneSource 12/31/97, 9/14/98