



From Mind to Market

Case Studies of Successful
Environmental Technology Companies
in Western Canada



Western Economic
Diversification Canada

Diversification de l'économie
de l'Ouest Canada

Canada 

Message from the Minister

I am very pleased to present this compendium of case studies on successful companies in the Western Canada environmental technologies sector.

The idea for these case studies came from the Western Canadian Environmental Technology Forum, which was hosted by Western Economic Diversification Canada (WD) last December. At the session, industry leaders remarked several times that “real case studies of successful companies” would be an invaluable tool for new companies and the entrepreneurs that lead them. Recognizing the need, WD has been able to respond in a practical and timely fashion.



The Western Canadian Environmental Technology Forum brought together over 120 leaders from the private and public sectors to discuss an action plan for moving the western Canadian environmental technologies sector forward. Paul Martin, then Prime Minister-designate, attended the dialogue session to speak first-hand with these industry leaders.

Prime Minister Paul Martin believes that environmental technologies are an important part of both our economic and social agenda, and that we must be ambitious if we are to leave the planet in better shape for future generations.

The case studies are a partnership between WD and the Canadian Institute for Market Intelligence (CIMI), an organization that has hands-on experience helping hundreds of early-stage technology companies to understand their business environment and bring their products to market. CIMI's expertise in providing business advisory services, market intelligence and technology commercialization support is now available to more entrepreneurs through these case studies.

Armed with these models of ingenuity, I picture innovative businesses all across the West devising new strategies and opportunities for success. The environmental technologies sector is a key component of the 21st century economy we are building in Canada and I commend you in your efforts to contribute to this exciting undertaking.

Together, we are building a stronger West and a stronger Canada.

A handwritten signature in black ink that reads "Stephen Owen". The signature is written in a cursive, flowing style.

The Honourable Stephen Owen, P.C., Q.C., M.P.
Minister of Western Economic Diversification and
Minister of State (Sport)

EXECUTIVE SUMMARY

Western Canada's environmental technology sector is in the early stages of development but successes are beginning to emerge. *Mind to Market* profiles four environmental technology companies from western Canada that have taken a concept through commercialization to realize sustained revenue. The four companies differ in age, product and service offerings, markets served, and type of ownership. While their stories reveal that there is no easy formula for success, some commonalities can be observed in their experiences.

The study showed that there are some aspects of technology commercialization that are unique to the environmental sector. Regulations tend to create market opportunities for environmental products or services. Also, specialized financing options, such as environmental responsible investment funds, are available to environmental technology companies. However, these factors alone are not enough to create a successful company. All profiled companies offer an impressive business case to customers that help improve performance and operational efficiency.

In fact, the most striking results of the study were the similarity in success factors to other technology sectors. The most significant factors driving success for environmental technology companies were talented and driven entrepreneurial leadership, a strong customer and market focus, and integration of sales and R&D objectives. The profiled companies realized that as they grew, so did their organizational needs. Human resources changed from primarily technical to include sales, marketing, and leadership capable of global expansion. Sales processes evolved to include distributor and formal lead generation and qualification processes. Strategic partnerships were employed to increase the scope of sales, distribution channels, research, and ongoing product design.

The good news is that it is never too late to start on the path to success. Not all of the profiled companies got it right the first time. Some of the companies interviewed experienced slow growth for many years. However, once a strategic market-focused approach was adopted, the companies were propelled into a high growth success story.

FROM MIND TO MARKET: ENVIRONMENTAL TECHNOLOGY COMPANIES IN WESTERN CANADA

The environmental technology sector in Western Canada is young but holds great economic promise for the region. Firms operating in this sector are generally small to medium-sized. Many companies are noted for the high quality of their technologies and expertise. Despite this potential, many lack the resources and experience to commercialize technology and expand sales.

However, examples of successful environmental technology companies are beginning to surface. The objective of this study is to investigate a sample of successful companies to uncover the factors that have led to their success. It is our hope that the experience of existing companies will provide growing environmental technology companies with a set of tools they can translate to their own circumstances.

Case Study Methodology

To begin the search for success factors, researchers selected four environmental technology companies. Researchers then focused on a defined set of business operations for in-depth analysis.

Company Selection

The research team selected one company from each Western Canadian province. The companies are diverse in their age, size, product offerings, markets served, and ownership. Despite their differences, all companies have one thing in common – they are successful. Each has taken a product or service from concept to commercialization and realized sustained revenue.

	Linnet Inc.	Ground Effects Environmental Services Inc.	Carmanah Technologies Inc.	BW Technologies Inc.
Location	Winnipeg, MB	Regina, SK	Victoria, BC	Calgary, AB
Year Founded	1988	1998	1998	1987
Employees	50	23	85	350
Product/Service	GIS & supply chain software	In-situ petroleum extraction	Solar-powered LED lighting	Gas monitoring devices
2003 Revenue	\$5 - 10 million	> \$1 million	\$9.2 million	\$53.6 million
Ownership	Private	Private	Public	Public

Company Analysis

Researchers explored multiple perspectives and areas of business operation. Two representatives from each company, a senior executive working for the company and an active business advisor working for a related service organization, offered their observations on company success. Researchers guided this exploration through a defined set of business operations. Six areas of operation were examined to reveal specific characteristics of the successful company:

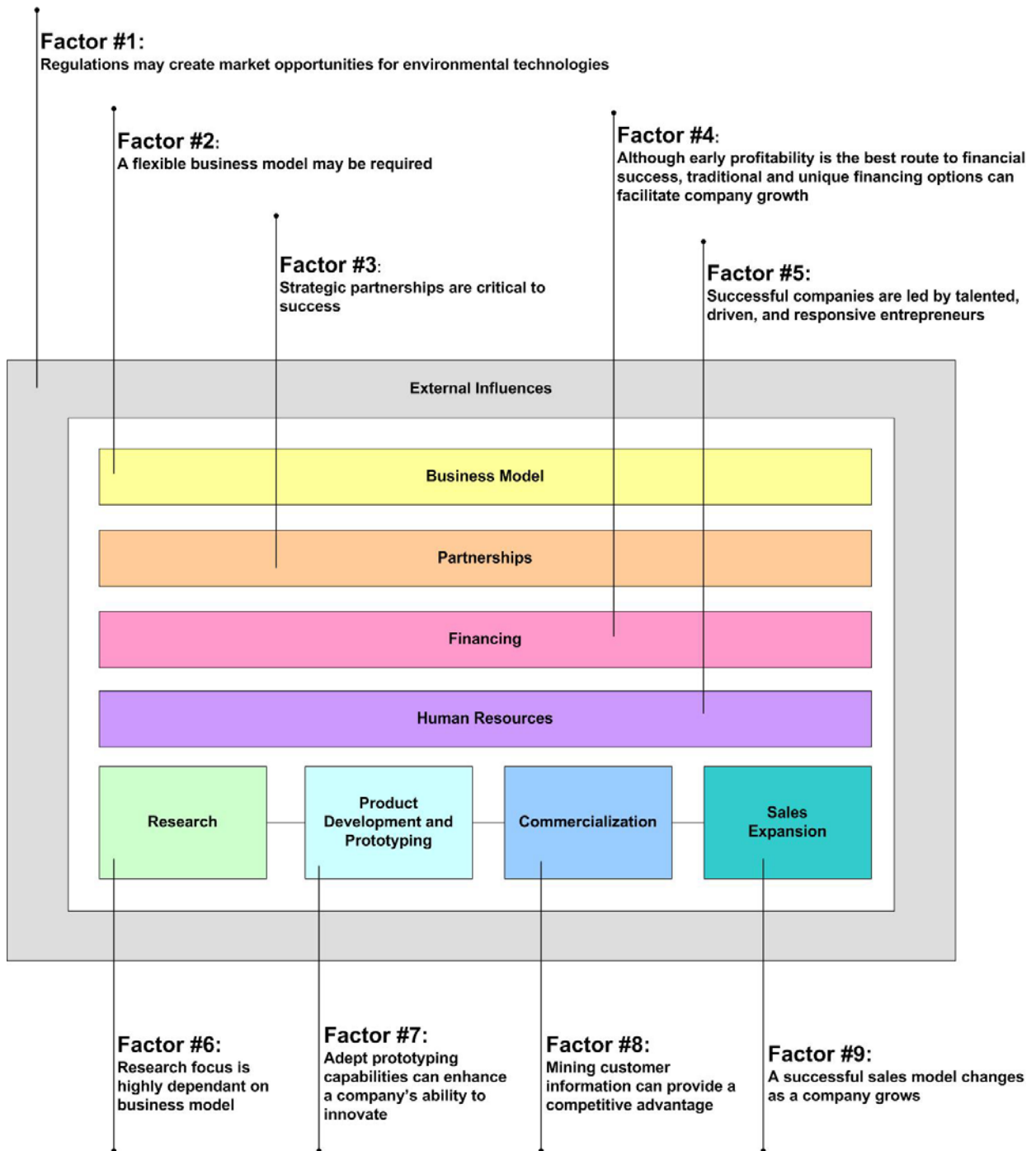
- i) The processes employed at four stages in the **product development cycle**: research, product development and prototyping, commercialization, and sales expansion;
- ii) The strategies used to develop the **business model** including intellectual property and licensing, ongoing innovation processes, legal considerations, operational excellence, and mergers and/or acquisitions;
- iii) The nature of **partnerships** with research organizations, suppliers, customers, distributors, marketing firms and incubators;
- iv) The significance of **financing** from founder, angel, private, public and government programs;
- v) The role of **human resources** including skill requirements, availability of individuals, and recruitment strategies;
- vi) The impact of **external factors** including government regulations, adoption of enabling technologies, and environmentally responsible values in society.

Success Factors for Environmental Technology Companies

The results showed that the road to commercialization is complex and often difficult. Each company faced the challenge of creating a product with an undeniable market need, acquiring first customers, attracting early-stage financing, and keeping up with the changing needs of a growing company. Each took a different path to overcome these barriers. While there are not easy answers to becoming successful, the study has illustrated some common characteristics of these companies and their unique stories.

Common Success Factors

As the executives and observers told their stories, similarities in their experiences began to surface. In each area of operation, researchers noted characteristics that were common to successful companies.



Success Factor #1: External Influences

Regulations may create market opportunities for environmental technologies.

Successful environmental technology companies are constantly scanning the environment for trends that might create market opportunities. Regulations enforcing environmental conservation measures play a significant role in creating markets for environmental technologies. However, successful companies did not rely on regulatory compliance to sell their product. All profiled companies offered a persuasive business case to customers. The technologies provided by these companies improved the bottom line or operational efficiency for their customers.

Success Factor #2: Business Model

A flexible business model may be required.

For many companies, their business model changed to reflect emerging market realities. Changes to the business model included changing from a technology-driven to a market-driven focus, expanding from an exclusive product or service offering, introducing a new product line, adding a product or service offering, or targeting a new market. Successful environmental technology companies showed flexibility in altering the business model to address discoveries in the marketplace.

Success Factor #3: Partnerships

Strategic partnerships are critical to success.

Partnerships offer young companies valuable assistance in commercializing products and realizing sales growth. The most effective type of partnership is determined by a company's business model: market-driven or technology-driven. Market-driven companies fostered customer relationships, which might involve user feedback, new product identification, or product design collaboration. Customer relationships result in reference customers, word-of-mouth marketing, improved product design, and research and development resources.

By comparison, technology-driven companies pursued research partnerships with universities, which might include shared facilities and research staff. Research partnerships allow young companies to fill technical skill gaps, gain access to specialized equipment, and elevate its profile as a technology leader.

Success Factor #4: Financing

Although early profitability is the best route to financial success, both traditional and unique financing options are accessible.

The ability to generate profits early was one of the easiest ways to obtain early-stage financing from angels, banks or other investors. However, research-intensive and high-growth companies generally require additional financing options. Profiled companies have pursued both traditional financing sources, such as going public, and more unique sources, such as research partnerships with customers and investment from socially responsible European investment funds.

Success Factor #5: Human Resources

Talented, driven, and responsive entrepreneurs lead successful companies.

The founders of profiled companies were not homogenous. One serial entrepreneur transferred his commercialization experience and industry contacts to his second technology start-up. One transferred his R&D experience from a large engineering firm to start his joint venture. Two started developing their product lines and customer contacts for their first companies while still in university. However, each of these successful entrepreneurs had the innate vision and determination that gave them the strategic direction and stamina they needed to create commercial success from a market prospect. The process was not always easy; founders may need to share the leadership role with a new CEO, move from a research-intensive to sales-intensive focus, learn a new way of integrating operations, and share control of a centralized “head office” with a more globally-distributed team.

Success Factor #6: Research

Research focus is highly dependant on business model.

For market-driven companies, the development cycle was considerably shorter, companies reached profitability sooner, and sales were generally restricted to a single industry vertical. Successful market-driven companies minimized research efforts and focused on improving existing products to meet an expressed customer need.

For technology-driven companies, the development and sales cycles were considerably longer, financing strategies were more complex, and there was a greater potential to transfer technology to multiple industry verticals. Strategies used by successful technology-driven companies include a more intense research period, development of a new technology that changed the way customers do business, research partnerships with universities, and vigilant protection of intellectual property to maintain technology leadership.

Success Factor #7: Development and Prototyping

Prototyping and manufacturing capabilities can enhance a company's ability to innovate rapidly.

Maintaining high-quality product or component manufacturing facilities enhanced a company's ability to meet customer needs and gain credibility in the marketplace. The ability to prototype rapidly enabled a firm to quickly prove the concept and feasibility of a new product to potential customers. Specialized manufacturing equipment provided companies with the ability to quickly produce unique products with a competitive advantage. An efficient product design and manufacturing capability can also enable a firm to quickly expand their product line. Certification of manufacturing capabilities provides yet another competitive advantage, especially in international markets; the majority of the companies studied had obtained, or were in the process of obtaining, ISO or CMMI certification.

Success Factor #8: Commercialization

Mining customer information can provide a competitive advantage.

Customer feedback has played an important role in all of the companies interviewed. For companies with existing competition, customer feedback was invaluable in creating a product that better met the needs of the market. For some, customer feedback has identified entirely new applications and industry verticals for an existing technology. For others, the relationships developed through customer communication have resulted in research and development partnerships.

Success Factor #9: Sales Expansion

An effective sales model changes as a company grows.

All companies studied had developed a global customer base following a similar pattern of sales model evolution. In the earliest stages of growth, relationship building with customers was essential to gain market entry with local customers. This might include involvement in industry associations, providing educational workshops, product demonstrations, or joint product development. To expand the scope of sales, all companies obtained a distributor to access markets in the United States, Europe, Asia, and the Middle East. Distributors provide not only sales representation but also supporting service, customer communication, and identification of expansion possibilities that would be otherwise infeasible for young and/or smaller companies. Finally, once a company had learned the unique characteristics of each of their global markets through the distributor relationship, they introduced a direct sales force. This increased the company connection to its customers, improved profit margins through direct sales negotiation, and provided feedback for product improvement and expansion. Successful companies include a sales focus near the beginning of this evolution with special attention to the human resources required to implement sophisticated sales processes.

Case Study #1

Linnet

Winnipeg, MB

Phone: (204) 957-7566

Website: www.linnet.com

CEO: Bruce Graham

Company Facts:

Year founded: 1988

Employees: 50

Revenue Growth: 25% per year between 1988 and 2000 (over \$5 million in 2003)

In the late 1980's, the Manitoba government had, among its many goals, two specific needs: to stimulate economic development and to develop a digital base map and data warehouse to support government services. They turned to two engineering firms to help meet these needs and were soon incubating a new geographic information system (GIS) spin-off company: ***Linnet***.

Linnet develops business applications for the agriculture, forestry, environment, and utilities markets. Linnet's products and services merge three key technologies. Geographic Information Systems (GIS) are crucial for processing spatial data that is fundamental to land-based businesses. Enterprise Resource Planning (ERP) software provides comprehensive information processing across multiple organizational units and among multiple user access points for quick and efficient information management in a globally-distributed market. Finally, web-based applications enable collaboration across organizational boundaries ranging from better supply chain management to community-based economic development.

Staying Ahead of the Market Leads to Opportunity

"Linnet got a head start with GIS technology. By the time they were experts, others were just touching the top of the iceberg," recounts Gino Braha, a management consultant with G. Braha and Associates Ltd., who was requested a couple of years ago to conduct a review of Linnet's software products. As the concept of combining data management with geographic location began to become more established, Linnet was well positioned to provide their professional service.

Despite their early success, Linnet's CEO, Bruce Graham, saw that a business model based exclusively on professional services was vulnerable to changing government policies and economic conditions. Graham has a research and development engineering background and he was used to problem solving. He makes the next step sound easy, "We just paid attention to where the market was going." The forestry industry had adopted GIS technology but the globalization of the industry increased data management needs. Agriculture companies were beginning to manage for better quality and the US Bioterrorism Act has since drastically increased the need for these same companies to trace the movement of their products. Then, Graham stumbled onto the Baan corporate website and all the pieces of the puzzle fell together - if Baan could provide enterprise resource planning (ERP) software from a small town in the Netherlands, Linnet could provide specialized supply chain software products for agriculture and forestry companies from Winnipeg. "With our software, a company can now manage and track the route of a plant from seedling to its processor," explains Bruce Graham. No other software producer offers data and business management products that are this comprehensive. "Linnet kept pursuing their two key markets and did not lose focus. Their competitive position and the upside potential of the market enabled the company to secure a seven-year financing deal with a local venture capitalist," explains Gino Braha.

A Combination of Product and Service Offerings Prove Advantageous

"We would not be here today without the early support of the Manitoba government," says Bruce Graham. The initial support to develop a professional services business provided many benefits to the company. The Linnet team established expertise in GIS technology before many of its competitors. While working with professional service clients, the Linnet team gathered information about customer requirements and market trends that could be applied to their new product development. Maintaining the professional service model also supported product sales. When dealing with long sales cycles in conservative markets, the provision of professional services allows Linnet to demonstrate their potential to customers before these customers make a larger investment in a complete product suite.

Strategic Partnerships Abound

Linnet has employed partnerships at every stage of their growth. When they began to develop their product line, they turned to one of their large forestry clients. Rather than completing the custom build the customer had requested, Linnet negotiated the co-development of a marketable product; Linnet had a test-bed for a widespread market and the customer had an ongoing revenue stream through product royalties. When Linnet needed to upgrade their technology they have turned to their technical partners. Formal partnerships with ESRI (a leading GIS software provider) and Oracle not only add credibility to the company's products but also provide access to a technical support network and early releases of technology upgrades required for integration. When faced with more difficult technology challenges, Linnet turns to its research partnership with TRILabs. "For a very reasonable membership price, we have accessed very high level technical expertise to add advanced data networking and data warehousing capabilities to our products," explains Bruce Graham. When Linnet felt challenged by their product's long sale cycle, they again turned to partnerships. After completing a service contract for a prominent agribusiness supplier, the customer approached Linnet to develop a formal sales partnership. This new sales partner services leads in the US agriculture market, pre-qualifies sales leads, and reduces the sales resources required by Linnet.

Domain Excellence First, Operational Excellence Second

Linnet worked with many forestry and agriculture clients through its professional service division. The Linnet team had developed an understanding of the information needs facing these customers. However, to become experts in their field, they decided to hire experts in their customers' fields. Linnet has two unique director positions in their firm: one with extensive domain knowledge in agriculture and the other in forestry. These individuals have worked for years in their respective fields and are now translating this knowledge to provide products that deliver. These are not figurehead appointments. Domain directors are the caretakers of their sectors with responsibility for research and development, customer service, and everything in between.

With the priorities of their customers covered, Linnet then turned to improving operational excellence. In the past the company used the Rapid Application Development (RAD) method to develop software. They found this process very difficult to manage resulting in delivery delays and budget overruns. Today, the company is in

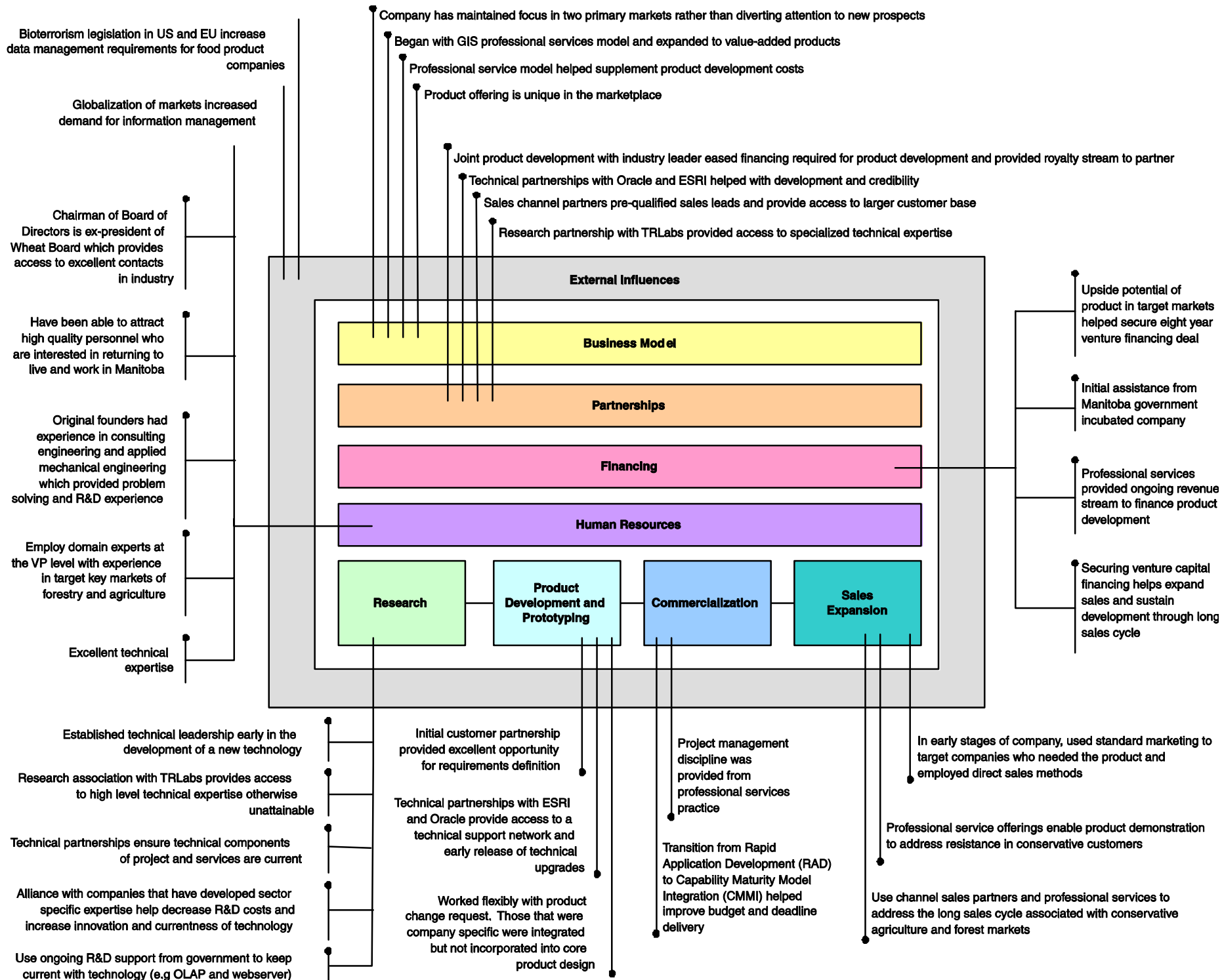
the process of becoming certified by the Capability Maturity Model Integration (CMMI) method. This process involves a rigorous set of sophisticated processes for development, integration of customer requirements, and quality assurance. By 2006, Linnet is hoping to become the first Manitoba company to receive a Level 3 certification under the program.

The Results

Today, Linnet software products are used by some of the largest forestry and agriculture companies across North America, including Del Monte, one of the world's largest fruit and vegetable distributors. The company employs more than 50 people from their Winnipeg Manitoba office. The company generated revenues between \$5 million and \$10 million in 2003 and has realized an annual revenue growth rate of approximately 20% between 1988 and 2001.

Analysis of Company Success Factors

- Excellent foresight in identifying trends in two industries – agriculture and forestry – that demonstrated increasing needs for large-scale data management.
- Entering a market with few competitors, and even fewer competitors offering enterprise level software, has positioned the company for market leadership.
- Numerous partnerships facilitate the sales process and reduce resources required for R&D.
- Professional services partially fund new product R&D and inform the product development process.
- Consistent focus on two conservative markets with long sales cycles has proved worthwhile.



Case Study #2

Ground Effects Environmental Services Inc.

Regina, Saskatchewan
Phone: (306) 352-1400
Website: www.groundeffects.org
CEO: Sean Frisky

Company facts:

Year founded: 1998
Employees: 23
Revenue growth: double sales every year (over \$1 million in 2003)

Sean Frisky incorporated Ground Effects Environmental Services (Ground Effects), a company that develops vapour extraction units at gas stations to remove petroleum products from the surrounding soil and groundwater. Before Ground Effects entered the market, these units were notoriously unreliable. He began experimenting with different technologies to improve the reliability of the unit and proposed the new system to his employer. Impressed with his innovative approach, his employer decided to give the new technology a try and Ground Effects had its first customer.

Ground Effects has developed technologies to remove oil and other volatile organic compounds from contaminated soil and ground water. Until recently, contaminated sites were excavated and contaminated material was landfilled. Ground Effect has developed a product line that tackles underground contamination on-site. The company's products measure the contamination and its impact, and remove this contamination through vaporization, oxygenation, liquid suspension, filter, and vacuum technologies. The resulting solutions provide an effective, economical, and low maintenance clean-up solution to customers.

Systems engineering approach solves a business problem

"Traditional engineering takes a stovepipe approach. Sean is a new kind of engineer," explains Dennis Belliveau, the Industrial Research Assistance Program (IRAP) advisor who worked with the young company to develop their product. Belliveau is referring to environmental systems engineering. "The systems engineer looks to the source of the business problem and can see the complex network of factors that cause and can solve the problem." For Ground Effects, this

capability translates into elegant product design. “Our systems use 30% fewer moving parts than the competitor which means fewer breakdowns and greater reliability for the customers,” explains Sean Frisky. With little to choose from, customers had become used to poor reliability from vapour extraction units. “It was not uncommon for these units to operate only 20% of the time,” explains Dennis Belliveau. The improved and streamlined design introduced by Ground Effects has improved the reliability of these systems to 99%.

Customer relationships pay off

Ground Effects epitomizes a market-driven company. Constant communication with product users provides the company with direction to expand their product line. “Sean has great contacts with some of the largest oil and gas companies in Alberta, such as Shell. He is able to sit down with these companies and talk about their long-term needs,” says Peter Beaulieu, the IRAP advisor who has worked with the company most recently. The company stays just ahead of the demand curve, minimizing research efforts in favour of rapid commercialization. Ground Effects began expansion with add-ons to their existing products. Soon, the company was developing entire systems for their customers. “Sean is able to see what customers need, and present a solution they had never imagined,” explains Beaulieu. For example, some of the solutions Ground Effects have produced are entirely self-sustaining, using the contaminants removed from the environment to fuel the extraction units. Customers are so impressed with the company’s ability to innovate that they have now started to partner with Ground Effects to fund joint research and development projects. “These companies have a great need for new technology but nowhere to turn for development services. They have partnered with us because innovative development is our specialty,” says Sean Frisky.

Product design and manufacturing capability facilitate rapid response

Ground Effects is able to take an idea generated in a customer meeting and develop it into a new add-on product or system in a matter of weeks. The key to this speed to market is a combination of product design and manufacturing capabilities. The company is able to anticipate the future needs of customers and incorporate these features into product design. “It is not uncommon to see flanges on the product that allow easy interchange of add-on parts or different power sources. The product can be easily modified rather than starting from scratch with an entirely new part,” explains Peter Beaulieu. Innovation at Ground Effects is prolific.

The company has developed over 100 products, some of which are not available anywhere else in the world. “We have just completed our first comprehensive catalogue. Customers are used to working with us to develop a specific solution to their problem. They are shocked when we hand them the catalogue and they see the scope of our operations,” says Sean Frisky.

Branding Excellence

“The products Ground Effects produces are first class quality. The company does their own manufacturing – it is a work of art,” says Dennis Belliveau. When IRAP and Ground Effects investigated introducing the practice of lean manufacturing to the firm, they realized that the basic components were already in place. The company keeps a small inventory of frequently used components, is based on quick delivery to market, and minimizes processing requirements. The high quality of Ground Effects’ products can be seen in every aspect of the company. With just 23 employees, the company is in the process of becoming ISO certified. “There are only about 25 ISO certified companies in Saskatchewan and very few of these are environmental technology companies,” says Dennis Belliveau.

The Results

Since its inception five years ago, Ground Effects Environmental Services has doubled the company’s revenue each year, expanded sales internationally, and grown to a staff of 23 people. Increasing their product line at an astonishing rate, the company has surpassed their competition to claim the position of market leader in Canada and provide products that are known as the “Mercedes” of the industry.

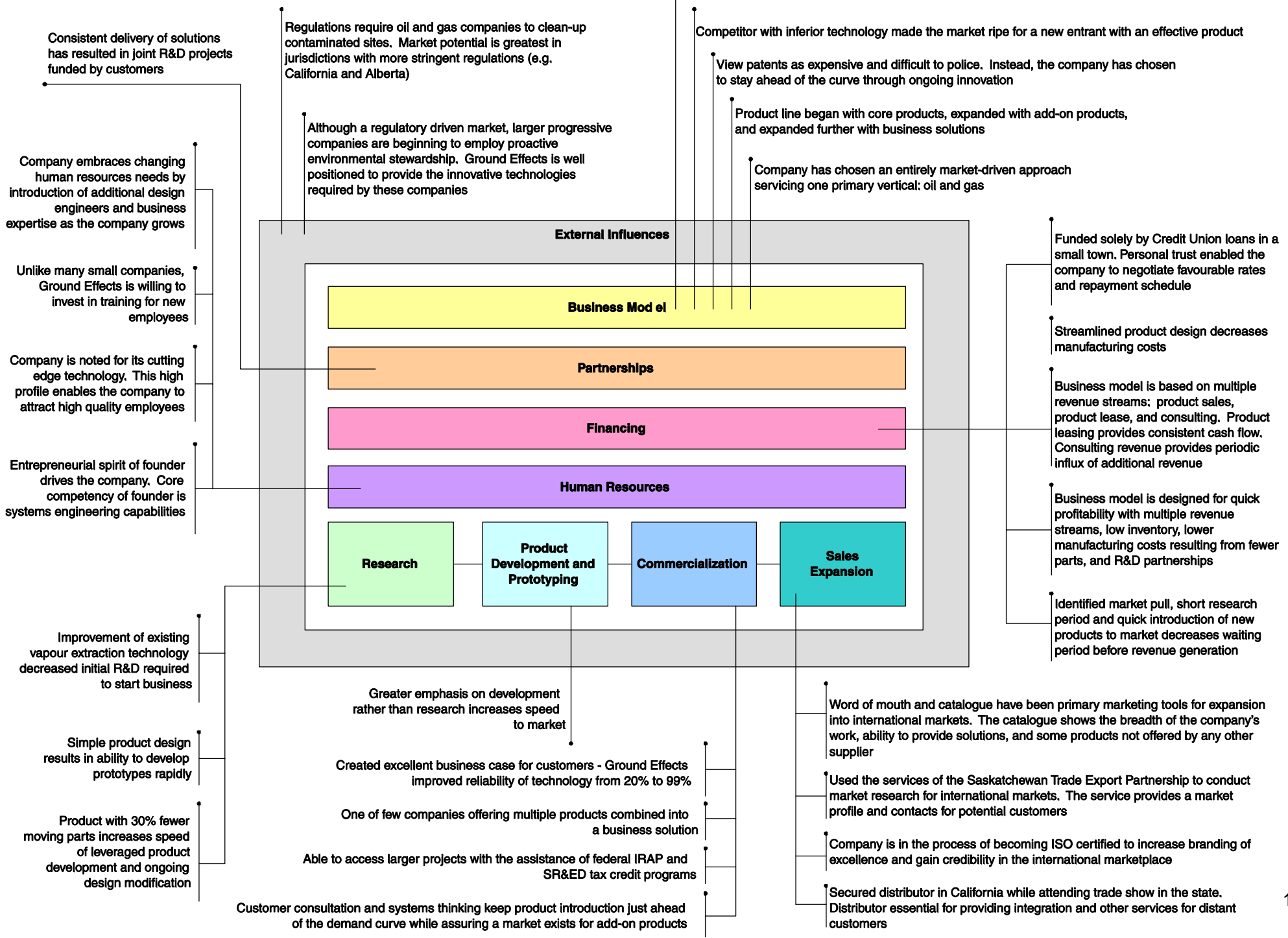
Analysis of Company Success Factors

- The company entered a market primed for innovation. Incumbent products were unreliable and customers had nowhere to turn for improvements. Ground Effects product performance results in a clear strategy for product differentiation.
- Simple but robust product design has improved product performance, increased innovation capacity, decreased time to market, and reduced ongoing development and manufacturing costs.
- The company expanded product offerings in many directions including add-on products, business solutions, “turnkey” projects, and joint research and development. This multi-

faceted expansion has improved product performance, increased revenue streams, and developed ongoing customer relationships.

- Maintaining control of manufacturing capabilities has enabled the company to brand excellence and increase speed to market.
- Vigilant attention to customer needs maintains viability of market-driven approach.

Provide products and services to both large oil and gas companies and the consultants that serve these companies. Fostering partnerships with consultants transforms a potentially competitive environment into one of mutual benefit



Case Study #3

Carmanah Technologies Inc.

Victoria, BC

Phone: 1-877-722-8877

Website: www.carmanah.com

CEO: Art Aylesworth

Company facts:

Year founded: 1998

Employees: 85

Revenue growth: approximately 75% annually since 1998 (\$9.2 million in 2003)

After selling his company, David Green set off on a sailing trip with his family. However, he soon ran into a problem: constant use of his anchor lights was draining his sailboat battery. Determined to develop a more efficient form of lighting for marine navigation, he set course back to Victoria and began his next company – Carmanah Technologies.

Carmanah designs and manufactures solar-powered light emitting diode (LED) lighting solutions for the marine, roadway and railway markets worldwide. In the past, lighting in marking channels and waterways, on moored vessels, and hazard lighting on roads, highways, and railways required regular maintenance by staff and a power source. Carmanah Lights use a self-contained energy source and LED technology for improved energy efficiency, higher light output, a wider colour range, and maintenance-free life of up to five years.

In the Right Place at the Right Time

Since the 1970s, light emitting diode (LED) technology has advanced considerably. The efficient devices can save up to 90% of the energy required to power an incandescent light. LED light sources are quickly replacing conventional lighting in the \$12 billion global illumination market. David Green saw LED lights as a natural partner for solar-powered energy. Since introducing the first solar powered LED light for marine navigation in 1998, Carmanah Technologies has carved out a niche of technical expertise in self-contained micro-lighting. “David anticipated the trend correctly. The LED technology is a bit quirky and he had a head start in uncovering the technology,” explains Art Aylesworth, Carmanah’s CEO. The company partnered with the University of Victoria and the British Columbia Institute of Technology to

develop the early technology. “We now have 20 to 30 techniques that we use to make very small solar-powered LED lights more efficient,” explains Art Aylesworth. For example, the small solar panels are domed to increasing the amount of solar energy collected at all angles; LED lights pulse rather than remaining on constantly; and, sophisticated software manages inconsistent solar energy input. Carmanah has patented many of these techniques. “This company definitely has all of their technical ducks in a row,” says Rob Wylie, the latest in a series of IRAP advisors who have helped the company develop their technology.

A Niche Market with Seemingly Endless Applications

Looking back, David Green may have wished his family vacation had been by bus rather than boat. The company’s first product was a self-contained marine light designed for the Coast Guards to use on navigation buoys. “We were presenting a disruptive technology and asking people to think differently. They did not even have specifications for LED lighting used in marine navigation,” recalls Art Aylesworth. The business case convinced the Coast Guard to consider the new technology; with smaller equipment and virtually no maintenance, the cost of servicing a single navigational marker could be reduced from \$50,000 per year to zero for the five-year life of the product. After four years of experimentation and certification in the highly regulated field, Carmanah’s marine lights were in place. The next application came more easily. When the transit agency in London spotted the Carmanah logo on a marine light in a channel, they called the local distributor. The group thought that the product might be perfect for new transit shelter lighting, for which the Heritage Committee has specified size restrictions. Unfortunately, the competitors had had months to develop a solution and Carmanah was coming in late in the game with only six weeks to the deadline. This is where four years of perfecting their craft paid off. The firm not only delivered the prototype on time but also won the contract and opened a new market opportunity. The range of possible markets continues to grow. “The company is now faced with opportunities that are simply too large to turn down,” explains Rob Wylie. Carmanah now manufactures self-contained LED micro-lighting for marine, roadway, railway, transit, and airport markets.

Formalized Management Practices

Formalized management practices were identified as an early priority by the founder. “We received ISO certification with only 12 engineers,” recalls Art Aylesworth. As the number of

customers and product lines expand, the company is pressured to develop a more sophisticated system to deal with the multiple streams of activity. An Enterprise Resource Planning (ERP) system helps to integrate the management of financial, manufacturing, customer services, and sales activities. After a few failed product ideas resulted from overzealous sales leads, the company implemented a Product Steering Group. Every new product improvement or market opportunity is vetted through this group of technical, sales, and business representatives. The Steering Group develops a business case for each idea to ensure it is strong from both a technical and market perspective.

Reconnecting With the Customer

Like many small companies with a limited sales force, Carmanah successfully partnered with a distributor to bring products to global markets. In 2000, David Green decided the company would need a new strategy to reach the next level of growth. He brought Art Aylesworth on board as CEO, a self-professed salesperson and team builder to complement David Green's technical expertise. Under the new sales focus, the company reintroduced a direct sales team and started an award winning e-commerce strategy. The firm has developed a micro-website for each of its industry verticals to increase tracking capabilities and present products in a market-specific context. The e-commerce sales channel now generates 20% of total sales, reduces sales processing time, and provides credibility and support for the direct sales team. "The website provides a good barometer for where people are interested in using our products. When we see a potential new application surfacing, we will put a business development person on the case to investigate the potential," explains Art Aylesworth.

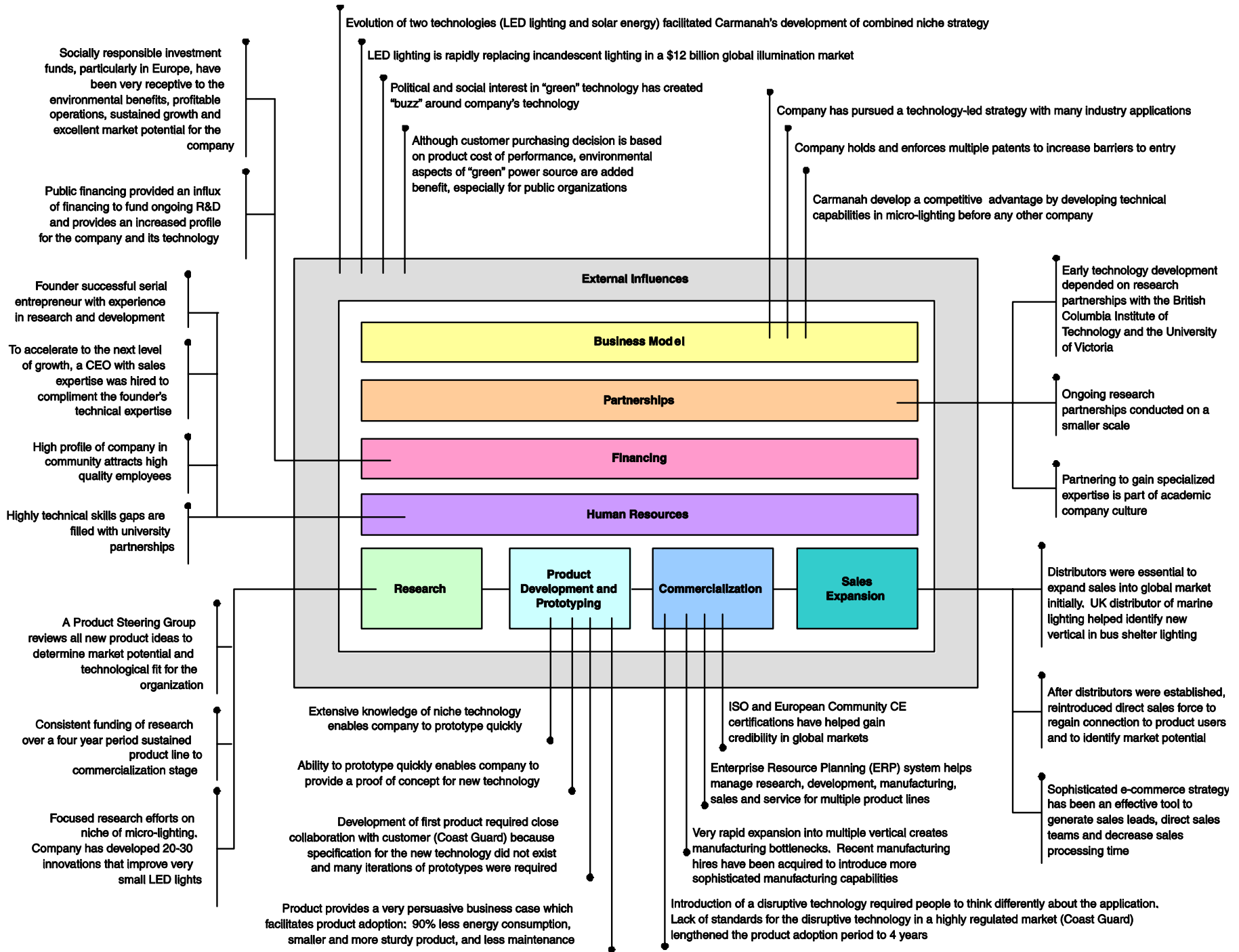
The Results

Over 90,000 Carmanah lights are now installed in over 110 countries. The company employs 65 people in their Victoria, BC head office and another 25 people in their Calgary-based subsidiary. It generated revenue of \$9.2 million in 2003 and has enjoyed an annual revenue growth rate of approximately 75% since 1998.

Analysis of Company Success Factors

- The company's technology-driven model paired with intellectual property protection creates a barrier to entry for competitors.

- The company followed a niche strategy that has enabled it to achieve technical leadership before competitors, some of which are large companies with substantial research and development capabilities.
- The company took advantage of the evolution of both LED and solar power technology to facilitate its success.
- Customers adopted the company's disruptive technology because it presented a radical improvement to business operations.
- The company's core technology is applicable to multiple industries expanding growth potential.
- Once the core technology was developed, the company embraced a sales focus to accelerate growth.



Case Study #4

BW Technologies Inc.

Calgary, AB

Phone: 1-800-663-4164

Website: www.gasmonitors.com

CEO: Cody Slater

Company facts:

Year founded: 1987

Employees: 350

Revenue growth: approximately 40% annually for past five years (\$53.6 million in 2003)

Sometimes entrepreneurship is a calling. At the young age of 22, Cody Slater was studying astrophysics when he came across a gas-monitoring device that he thought could use some improvement. He decided to leave school and soon the world's first solar-powered, wireless gas detection system was the flagship product of his new company - BW Technologies. The company went on to develop multiple product lines including disposable personal detectors for various gases.

BW Technologies designs, manufactures and markets a full line of gas-detection equipment. Poisonous gases are a daily risk for people who work in many industries, including mining, fire rescue work and the oil and gas industry. The company created the world's first wireless, solar-powered gas detector. Other products produced by BW include portable, hand-held instruments, as well as detectors that can be stationed or affixed in buildings.

Quick Delivery to Market

BW Technologies can take a product to market in six to eight months, compared to about 18 months for competitors. "Our competitors did not believe our claims when we first entered the marketplace. They soon heard from their customers that they needed to pay attention," recalls Bryan Bates, Chief Operating Officer and Executive Vice-President at BW Technologies. Exceptional manufacturing capabilities fuel this speed. For example, the firm invested in their own surface mount line to reduce the need for outsourcing. Now they can run three iterations of a design in three days, compared to a three-week turnaround from an outside firm. "They don't worry about patents. They can move faster than any of their competitors and stay two steps

ahead,” explains Bill Croft, the founder of the incubator that first housed the young company. Keeping ahead of the technology curve is part of the culture at BW Technologies.

Formalized sales process

Six years ago, Cody Slater hired Bryan Bates from an American competitor. Bates describes the advanced sales techniques employed by the company: “We use the Harvard Business School model for sales execution: vision, action plan, and accountability.” With a network of distributors and large direct sales force, coordination of daily operations, the “major” project pipeline, and performance monitoring is essential. This complex coordination is facilitated by a Customer Relationship Management (CRM) system. “I could measure our performance every five to ten minutes if I needed to. This is how responsive and connected our field staff are to the support tools provided by our company’s infrastructure,” explains Bates. Despite the size and sophistication of the company, they have not lost sight of the roots. “Bureaucracy can be the death of a company. Even when you become a sizable entity, you need to maintain a spirit of entrepreneurship and risk-taking throughout the organization.”

Evolution of a Business Model

Like all companies with a sales-focused philosophy, BW Technologies is constantly looking to its customers for market direction. “When we focus our outside sales force on the end user with the objective of determining not just their current requirement, but also their future needs, everything naturally falls into place including key distributors,” says Bates. The company began to notice that their oil and gas customers were using more and more contractors. They investigated the needs of these new customers for their personal mobile gas detectors, the firm’s primary product line. Contractors needed a small, inexpensive unit that was very easy to use. The focus of the product design and introduction was to reduce the cost of ownership. With BW Technologies’ disposable monitors, users can eliminate the need for maintenance and calibration at a cost of approximately \$0.25 per day.

Growth Strategies for an Established Company

What does a developed company do to continue expanding? BW Technologies turned to the public markets and acquisitions. The company went public in 1997 on the Toronto Stock Exchange. The move had the expected results of additional financing, increased company

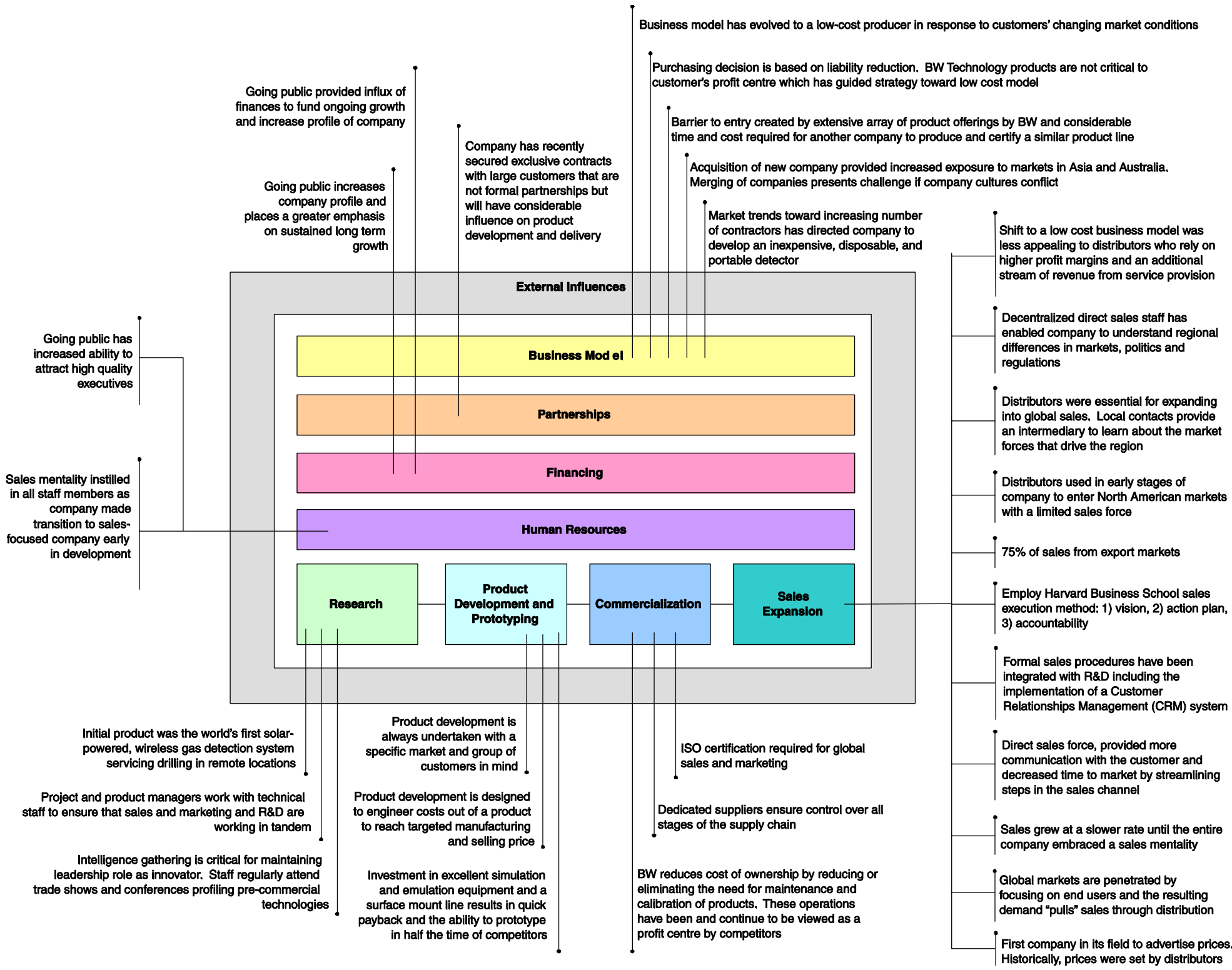
profile, and scrutiny of long-term strategies to maintain growth rate. BW Technologies also acquired their first company, Vulcain Alarme Inc., in 2003. This acquisition introduced the company to new markets in the commercial sector. With the expanded market reach comes the inevitable task of combining two company cultures into a single effective unit.

The Results

BW instruments are used by organizations such as British Petroleum, Shell, Weyerhaeuser, and the U.S. Coast Guard, as well as the cities of New York, Chicago, Los Angeles, Montreal, Toronto and Sydney, Australia. The company employs over 350 people and has offices in Calgary, Alberta, the United States, the United Kingdom, Australia, and the United Arab Emirates. The company generated revenues of \$53.7 million in 2003 and has realized an annual revenue growth rate of approximately 40% over the past five years.

Analysis of Company Success Factors

- This market-driven company uses ongoing technology-based innovation and quick time to market as a competitive advantage.
- The company has used distributors to initially break into global markets and then quickly moved to install a regional presence with their own people where the opportunities warranted.
- The company's sales processes are very sophisticated, yet fundamentally simple.
- The company's business model is clear – providing low cost products that reduce total cost of ownership for customers.
- Quick time to market is realized through the company's controlled manufacturing capabilities.



Western Economic Diversification Canada (WD) is the federal department mandated to promote the development and diversification of the economy of Western Canada and advance the interests of the West in national economic policy.

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