

5-1-2014

An Innovation Formula for Privately Held Mid-Sized Companies

Jennifer Brusso

University of Wisconsin-Milwaukee

Follow this and additional works at: <https://dc.uwm.edu/etd>



Part of the [Industrial Engineering Commons](#)

Recommended Citation

Brusso, Jennifer, "An Innovation Formula for Privately Held Mid-Sized Companies" (2014). *Theses and Dissertations*. 452.
<https://dc.uwm.edu/etd/452>

This Thesis is brought to you for free and open access by UWM Digital Commons. It has been accepted for inclusion in Theses and Dissertations by an authorized administrator of UWM Digital Commons. For more information, please contact open-access@uwm.edu.

AN INNOVATION FORMULA FOR PRIVATELY HELD MID-SIZED COMPANIES

by

Jennifer L. Brusso

A Thesis Submitted in

Partial Fulfillment of the

Requirements for the Degree of

Master of Science

in Engineering

at

The University of Wisconsin-Milwaukee

May 2014

ABSTRACT
AN INNOVATION FORMULA FOR PRIVATELY HELD MID-SIZED COMPANIES

by

Jennifer Brusso

The University of Wisconsin-Milwaukee, 2014
Under the Supervision of Professor Satish Nambisan, PhD.

The principal objective of this paper is to create an innovation formula that streamlines and optimizes the innovation process in mid-sized privately held companies. Research included case studies of three privately held mid-sized companies. A comparison and analysis was completed on how each of the companies innovate, the success of methods used, and their ability to adapt to adversity. To address the increasing demand for innovative products and services that privately held mid-sized companies need to deliver on, information taken from the case studies was utilized to derive an innovation formula that focuses on customer engagement, professional affiliations, and open innovation.

© Copyright by Jennifer L. Brusso, 2014
All Rights Reserved

Dedicated to my fantastic family.

TABLE OF CONTENTS

SECTION	PAGE
I: Introduction.....	1
II: Research Approach.....	1
III: Company Profiles.....	3
IV: Comparison of Environment and Business Strategy.....	7
V: Innovation Formula.....	23
VI: Recommendations.....	33
References.....	34

LIST OF FIGURES

Figure 1:	Mid-Sized Companies.....	8
Figure 2:	Porter’s Five Forces.....	12
Figure 3:	Product Architecture.....	20
Figure 4:	Modular Architecture.....	21
Figure 5:	An Innovation Formula.....	23

LIST OF TABLES

Table 1:	Porter's Five Forces and Case Studies.....	13
Table 2:	Open Innovation Networks.....	19

QUOTATION

Give people a good reason to remember you by.

By Jennifer Brusso

Chapter 1

Introduction

Innovation is rapidly becoming the decision maker in a company's success. As sales channels integrate deeper into global pathways and startups are becoming competitive, privately held companies need to keep their head above water in the global marketplace.

Where does your company get ideas? How do you know which ones to pursue? At what point do you stop pursuing them? All are common and ongoing questions that are asked when companies try to innovate. Research into three, privately held mid-size companies offers a look at options in how companies answer those questions. In depth investigation in seeing those processes in action have led to a formula that may work for privately held companies.

The objective is to create an innovation formula that streamlines the innovation process in privately held companies.

Chapter 2

Research Approach

The approach taken to accomplish this began with participating on new product development teams and learning the innovation process at three unrelated privately held companies. Management structure, business development, sales channels, internal and external communication were studied for in-depth knowledge of their

respective environments. Each company was followed throughout their new product development process, beginning with idea creation and concluding with sale of the new product or service. Discussions were held with employees that had involvement with both innovation and new product development teams. For perspective, employees not working directly with those departments were also included in this review.

The respective innovation processes were analyzed according to the following:

- Type of innovation process the company follows
- How and where ideas were submitted
- How innovation teams were assembled
- Risk vs. Reward, how they determined what idea to pursue
- Prototyping and testing of the idea
- Milestones and jump off points
- How the idea was introduced to the market
- Future growth plans

Of particular interest is how each company addressed ideas with high risk and high degree of uncertainty. Understanding how the respective companies identified the critical points in their process and addressed the risks was important for comparing how innovation was fostered in their environment.

This report will provide a comparison and analysis of the above criteria and how each of the companies innovate, what methods are successful, and what methods are roadblocks. This information was then utilized to derive an innovation formula that could be applied to similarly sized privately held companies.

Chapter 3

Company Profiles

While the companies' names, products, and services are being withheld for anonymity, a background of company history and current environment provides a framework of how the companies innovate today.

Company A

Company A is a midsize privately held company of nearly 400 employees that began as a startup in 1948. A collaborative group consisting of a handful of employees merged their similar construction and materials careers. The company focused on testing and began providing consulting services to local businesses. As more employees were added to fulfill the increasing demand for service, satellite locations were established in neighboring states, and eventually supported global clients. Serving both private and public clients gave the company an edge in developing new services and techniques.

Company A operated as a flat organization, where employees were only one supervisor away from the founding partners and they were able to work on various

projects with departments across the board. Unique to this company, every employee was trained and expected to manage their own budgets, accounts, workload, and often bid for their own work. Autonomy was present in every part of the company.

This company did not work in the technology sector, but technology played a key role in its success. The smallest of the three companies researched (less than 400 employees), it had the highest adaptation rate of new technology. Rarely were upgrades limited to equipment. This company invested year after year in software updates, programs, training, and even in areas of seeming unimportance, like desk phones. If there was something new on the market, their Office Manager was either testing it or buying it for implementation throughout the company. This understated presence of “newness” fueled innovation into other areas of the company.

Company B

Company B began as a startup from an entrepreneur. The individual investor saw a need in the market for a product that was not currently being sold in his existing company. His investment paid off and the initial venture was eventually sold to help sustain the new company. The company maintains a staff of close to 500 employees at four facilities. Their customer base is global, with direct communication with their customers if needed.

The company operates on a very expected, but cyclical year. The comfort of knowing the up and down times of the production schedule gave the employees time to be part of the innovation process. As the company grew the innovation process of

utilizing a phase in/phase out approach led to the establishment of a separate prototype facility. The prototype facility eventually was spun off into a separate company, providing services to outside contractors. The prototype company provides year-round support with contract work to offset the cyclical slow points of the year of the business.

Employees at the prototype company are key members on innovation teams. The innovation, or 'pilot' teams are set up on an annual basis and account for ninety percent of the new product development. The other ten percent is from resolving manufacturing issues or client requests.

The pilot teams, while given specific deadlines and milestones, have little control over the uncertainty of their diverse product. Most years the new product requires unique processes that have not been seen by the manufacturing floor. Lean and quick response manufacturing are imperative to implementing the new processes with a short production life. The company has accomplished successful product launches year after year because employees embrace constant change. In this environment, both management and employees create a constant feedback loop of ideas on current and new products.

Company C

Company C is family founded company that is in its fifth generation. Established in the early 1900's it is the longest running company used for this review and analysis. Company C has approximately 500 employees and four main manufacturing facilities. The company has diverse and extensive product lines, producing both endless quantities

of standard product to one-time builds to meet a client's unique requirements.

Products are distributed globally and the company has a developed supply chain with dedicated resources to represent the needs in the different regions of the world.

Innovation and new product development have most notably been a combined effort of project teams and product management ideas. Until recently the two were intertwined in a top-down approach. Company C is shifting toward a less stringent framework of a traditional stage gate process for innovation. They have also introduced a way for any employee to submit suggestions for a process, product, or simply to do something better. Innovation is not limited to a department and ideas are welcomed from all.

Even before an in-depth analysis of the different companies, some obvious similarities and differences stand out.

Similarities

- Privately-held
- Original owners are either still working for the company or have family that have taken over for them
- Mid-sized with 400-500 employees
- Global customer base
- Innovation is not only important, but a focus area for all three companies

- New products are introduced to meet customer recommendations

Differences

- Varied product lifecycles: Company A and B are shorter, Company C is longer
- Company A focuses on services, Company B and C on products
- Supply chain is fixed for Company B, varies for Company A and C
- Employees at Company A handle all aspects of a new project, including financials. Employees at Company B and C have a team approach.
- New product development and innovation are one in the same for Company A. For company B they are entirely different. Company C has overlap between the two.
- Company A innovates using project timelines and customer requirements as a goal setting framework. Company B utilizes a consistent 1 year cycle of idea to market every year. Company C relies on stage gates.

Neither the similarities nor the differences make one company stand out more than the other at this point. However, aspects from each contribute to the formula that could improve their process.

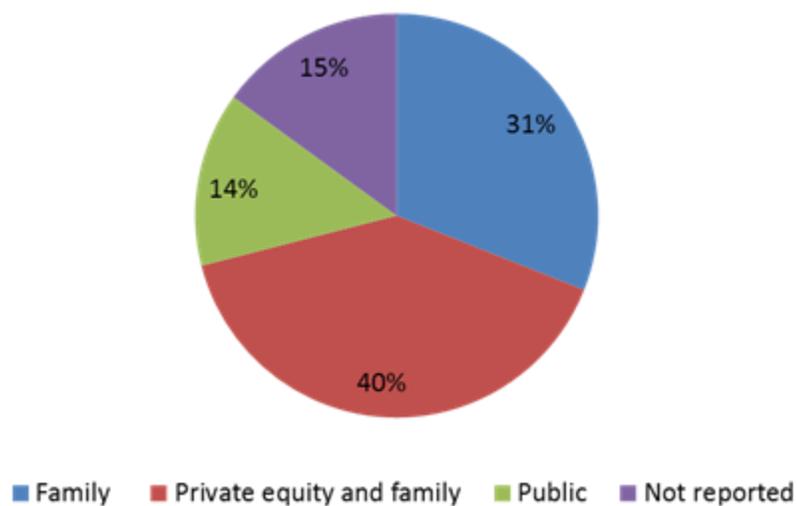
Chapter 4

Comparison of Business Environment and Strategy

The classification of a mid-size company is based on annual revenue and employees. While how much and how many varies from different sources, the most common definition describes a mid-size company as one with greater than 500 employees and revenue exceeding \$10 million dollars per year. The three companies in this analysis fit that definition.

By the numbers, the United States has close to 197,000 mid-sized companies and employs approximately forty million people. Of this total, nearly 75% of them are privately held and 14% are traded publicly. For comparison nearly 68% of large businesses that are publicly held.

Figure 1: Mid-Size Companies



Privately-held mid-size companies have had to endure an extended economic recession, handle the extremes of the recovery, and maintain their position in the global market. While small and large companies have had to address the same concerns, small

companies are given leniency and exemptions to remain viable and large companies generally have reserves for lean times. Add in changes to healthcare and increasingly specific regulatory standards and it is not a surprise that mid-size companies have to be creative to overcome these obstacles.

The obstacles, while challenging, keep companies' eyes open. They stay more focused on customers, are more likely to incorporate social media, and try various management methods to stay innovative.

The following table compares the basic differences between both publicly and privately held companies and shows some criteria overlap with the three followed companies. Some of the overlap is due to the mid-size companies' ability to adapt to growing market needs and understanding that flexibility plays a key role in staying in those markets. All three companies are locally established but compete domestically and globally.

	Privately-held	Publicly-held	Company A	Company B	Company C
Ownership structure	Typically family owned or small group of investors (founders of the company)	Public company - with many shareholders and investors. Offering of securities for sale to the general public	Small group of investors	Single owner (entrepreneur), now employee owned	Family owned, 5th generation
Capital	Private funding, reinvestment of profits, research partnerships to find new markets/applications Not required to disclose financial information	Access to financial markets. Capital can also be raised through securities sales.	Privately funded, reinvestment of profits by founders and board of directors	Privately funded, then opened for employee ownership, sister company started to support business	Privately funded, reinvestment of profits by owners, acquisitions and partnerships
Financial earnings	Not required to disclose financial information	Required to file quarterly earnings reports	Annual sales data available, detail shared internally	Annual sales data available, general information shared internally prior to employee ownership	Annual sales data available, detail shared internally
Age	Typically greater than 50 years old	Average of 30-40 years old	66 years	29 years	93 years
Market	Local or Global	Local and Global	Global	Global	Global
Product portfolio	Focused on core products	Diverse products/services due to acquisitions of other brands	Focus on core services, products/services of little familiarity are contracted out	Focus on core products	Focus on core products, some diversity due to two acquisitions of adjacent product lines
Speed to market	Slow	Fast	Fast (within 6 months)	Fast (within 1 year)	Slow (greater than 1 year)
Product differentiation	Research, concept, imagination, passion, quality, lifestyle, elegance	Consumer-driven, availability, marketing/advertising	Consumer driven, marketing, research	Consumer driven, concept, imagination, lifestyle	Research, concept, consumer driven, lifestyle, marketing
Pricing	Affordable to expensive	Typically affordable	Expensive	Expensive	Affordable to expensive

Competition is growing in each of the companies' market segments, and the business strategies of each were reviewed using Porter's Five Forces model.

This method is so named after its founder Michael E. Porter. The model identifies five competitive forces common in every industry and analyzes them. The model provides a way of determining an industry's strengths and weaknesses. Porter's five forces include the following:

- Rivalry among existing competitors
- Bargaining power of customers
- Threat of substitutes
- Bargaining power of suppliers
- Threat of new entrants

The model, as shown below, can also aid in corporate strategy by highlighting areas to focus on.

Figure 2: Porter's Five Forces



Using this model, each of the three companies were compared to show the forces that affect them. Areas of concern are detailed in the following table.

Table 1: Porter's Five Forces and Case Studies

	Company A	Company B	Company C
Rivalry among existing competitors	*Industry growth *Access to resources (equipment, labs, testing)	*Overcapacity *Diversity of competitors *Access to distribution	*Industry growth *Brand identity *eCommerce *Presence in marketplace
Bargaining power of customers	*Comparison of contracts *Ability to hire multiple companies for a project *Flexibility to amend existing contracts at will	*Favorable return policies *Flexible product & services warranties *Requirements are subjective to the buyer	*Brand identity *Impact of quality & performance *Delivery deadlines *Distribution channels
Threat of substitutes	*Substandard service *Availability	*Substandard products *Availability	*Substandard products *Availability
Bargaining power of suppliers	*Contracts *Availability of resources *Opportunity to end agreements without penalty *Regulation	*Costs relative to total purchases *Contracts, subcontractors	*Costs relative to total purchases *Contracts, subcontractors
Threat of new entry	*Environmental agreements	*Capital investments *Existing relationship with customer *Product improvements	*Patents, licensing agreements *Capital investments *Government regulation

Technology Commercialization of Projects of High Uncertainty

In addition to analyzing the different forces that affect innovation, companies also need to find a way to address projects of high uncertainty. Mid-sized companies are sometimes hesitant to take on projects of high risk or investment cost due to their either lack of reserves to spend money solely for the purpose of discovery or for their belief of obligation to stay committed to an investment. Both of these concerns can be addressed by utilizing systems already in place, such as stage-gates.

Idea generation is one thing, but establishing the phases a company goes through in taking the idea into the development phase is a different territory. Does it make sense to follow the strict stage gate criteria of new product development? What if the idea becomes difficult to cultivate into a real product or service? How do you know when it should not be continued? The jump off points?

A privately held company has a distinct advantage of pursuing any number of ideas without the oversight and control of shareholders. There is a freedom in being able to look into new technologies or applications, trying them, and then deciding to move forward or not. The history of the innovative product stays only with the company. A mid-sized company has the best of both worlds as they are large enough to allocate resources and financially support them, yet they are small enough to not get lost amongst rigid corporate structure.

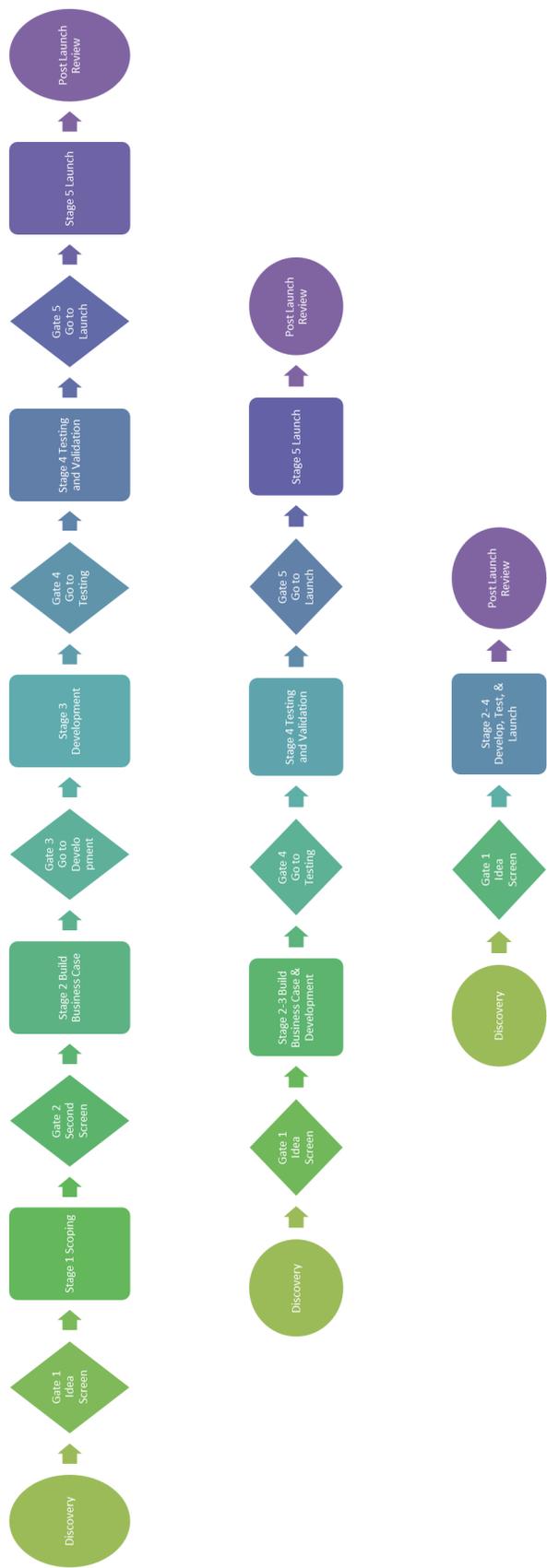
Like the three selected businesses, most mid-sized companies have established business operating systems. Within those systems exists a formalized approach to new

product development. And while guidelines and gates are necessary for a methodic approach to milestone checkpoints and project completion, they may hinder innovative growth. Innovation is a change, revolution, departure, transformation, or upheaval to what is exists. It is almost the opposite of a step-by-step logical method of new product development.

I am in agreement with the many companies and organizations that recommend innovation be managed, to a point. Budgets are not bottomless, resources are not always plentiful, and not all ideas get a chance to be tested. But, imagine if they were. Being able to try anything at any cost with access to any resources you would need could result in endless churning of new ideas into the world. Creativity could remain creative. Without the fencing in of ideas and narrowing options, companies could expand their businesses in ways they would never dream of. The marriage of a company's business system and its innovation plan is not the ideal union. Rather a business system that can feed off its innovation plan can benefit the company in many ways.

Taking the stage-gate approach to product development, companies can use this system for projects or ideas that do not necessarily need every gate requirement checked off. The following chart shows steps that can be consolidated for high risk or high uncertainty projects. While they may be of equal importance, not all ideas require the same type of investment to get to the move forward or abandon decision. Low cost, low risk projects do not need to go through gates as detailed as a high risk project.

Adjusting process steps for development can save a company time, resources, and money. Versions of simplifying the stage-gate process are shown below.



Open Innovation Networks

Understanding the type of innovation network a company operates can clarify the type of risk being taken, how they can bring the idea to fruition, and the resources that they utilize to do so. The following table displays the different networks (Orchestra, Creative Bazaar, Jam Central, and MOD Station). Each network has defining characteristics and it is interesting to point out that companies may overlap in categories and do not stay exclusive to a particular network. This demonstrates the need for companies to adapt to changing markets and environments.

Table 2: Open Innovation Networks

	Orchestra	Creative Bazaar	Jam Central	MOD Station
Innovation goals and architecture	Well-defined innovation goals; clearly specified and modular innovation architecture Company A Company C	Broad innovation goals that can be tied to a specific market space; limited articulation of innovation architecture Company B	Broad innovation goals but not well tied to an particular market space; limited articulation of innovation architecture	Well-defined and relatively modular architecture; innovation opportunities not predictable or well defined
Addressable market for innovation	Clearly defined market opportunity (usually greater than \$300 million) that is tied to the innovation architecture Company B	Broad innovation goals that can be tied to a specific market space; limited articulation of innovation architecture Company A Company C	Market opportunities are not always clearly defined; might involve immature markets that have the potential to grow rapidly	Market opportunities are not always quite evident and tend to be niche
Nature of innovation contributions	Implementing, complementing, or extending the innovation architecture Company C	Mostly stand-alone innovations that meet the broad innovation goals of the firm	Specialized contributions that help define and implement the innovation architecture Company B	Complementing or enhancing the existing innovation architecture; new market opportunities Company A Company C
Nature of technological change	Predictable but potentially major technological changes Company B Company C	Relatively moderate technological changes Company A	Significant and often unpredictable technological changes	Predictable and relatively moderate technological changes
Nature of innovation risk	High development and commercialization risk Company C	Moderate to high development risk; moderate commercialization risks Company B Company C	High development, and commercialization risks	Low development risk; moderate to high commercialization risk Company A

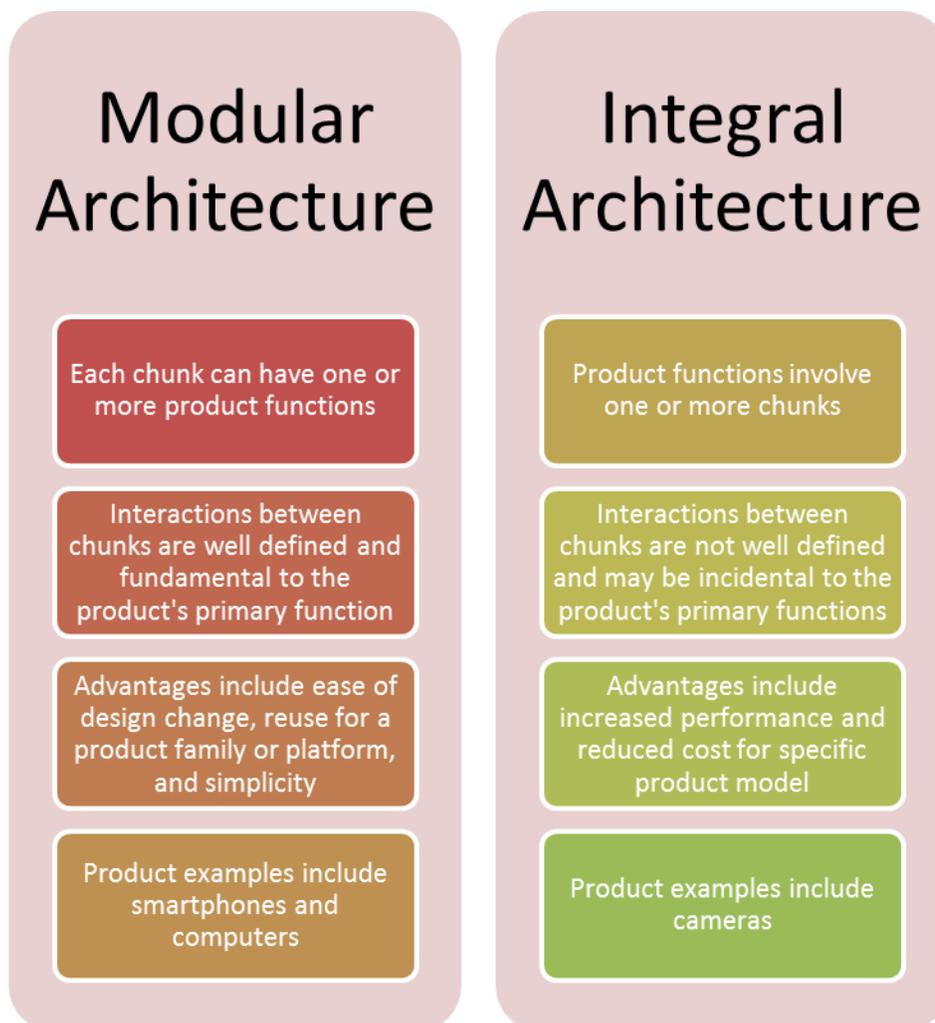
Product Architecture

A major component that drives how quickly a company can take an idea to market is product architecture. The architecture of a product has both functional and physical elements. The functional elements are defined as the individual operations and transformations that contribute to a product's overall performance. The physical

elements are the components and parts that implement the functions of the product. The product architecture utilizes the functional elements and arranges the groups of physical elements, chunks, into a scheme by which they interact.

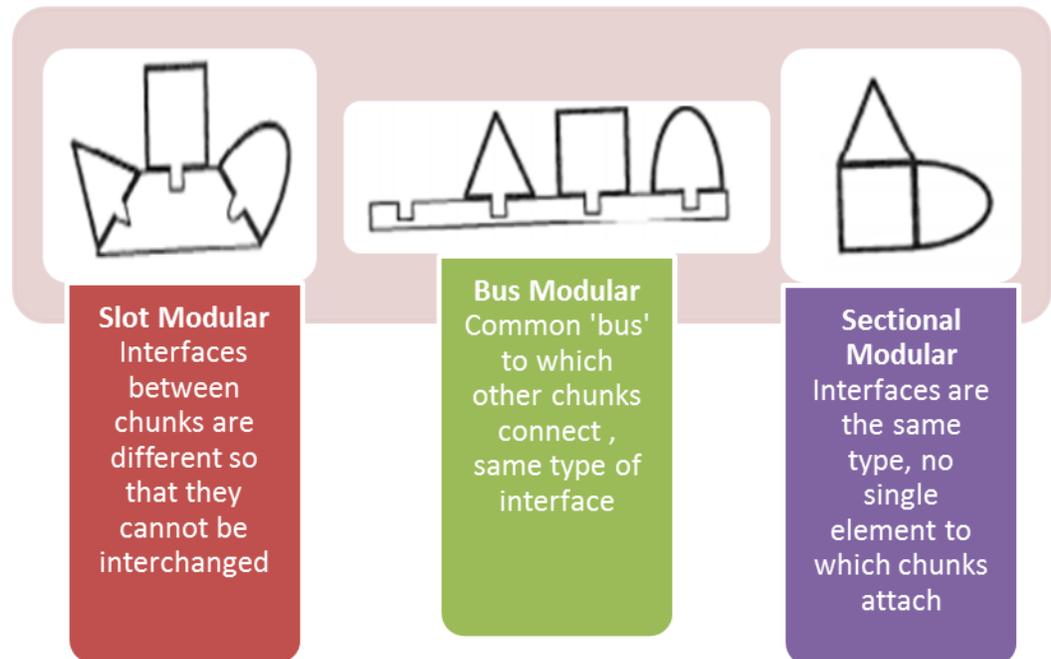
Product architecture can be divided into two types, modular architecture and integral architecture. While products are not strictly modular or integral, they may exhibit characteristics that identify them with being more modular or integrated than another product.

Figure 3: Product Architecture



Products that are modular in architecture can be differentiated by the following three types: slot-modular, bus-modular, and sectional-modular.

Figure 4: Modular Architecture



Why is product architecture important to the innovation of a new product? It forms the framework for product change, product variety, component standardization, product performance, manufacturability, and management of product development. This determines how a product will be developed, manufactured, and marketed. Companies A, B, and C each have examples of products that have modular and integral architecture.

Company A, while primarily a provider of services, the products that are generated are mostly of integral architecture. They are client specific and are designed

for use only on their project. The projects have many unknowns and questions are answered as the project is progressing. The equipment, or product, is designed to limit the uncertainties by giving guidelines and not concrete answers. Equipment is specialized for a particular task and therefore must be integrated to other systems to offer the highest reliability.

Company B utilizes a slot modular approach to product architecture. The quick turnaround from idea to production nearly requires interchangeability. When a finish assembly part is going through final quality checks and does not pass for a particular component, a swapping out of the failed component must occur quickly. The rest of the unit may continue testing while waiting for the replacement part and limit lost time. Warranty concerns are addressed with little turnaround time due to the slot modular architecture. A component may be sent out in advance of the return one arriving back.

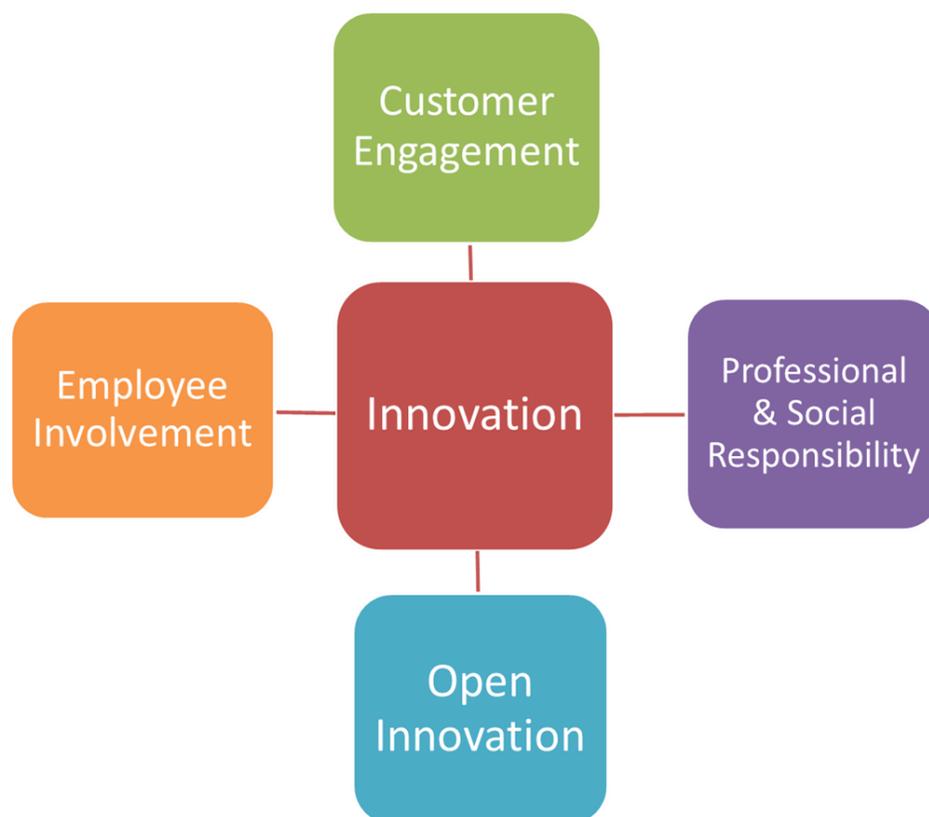
Company C uses both modular and integral architecture in development of their products. The company produces items that are anywhere along the range of one-time buys to mass production. Depending on the type of product and customer specifications, the architecture could be modular or integral and can vary from customer to customer for the same thing. Products that require a promised two-day shipment from time of order generally are of modular architecture. Products that require extensive testing or regulatory compliance have integral architecture.

Chapter 5

The Innovation Formula

Comparing three companies and their unique innovation processes gave a look into what works and what doesn't. And while the processes fit each respective company's business plan, the takeaways lead to a formula for mid-sized privately held companies. This formula consists of the following components: customer engagement, employee involvement, professional and social responsibility, and open innovation.

Figure 5: An Innovation Formula



A green rounded square icon containing the text "Customer Engagement" in white.

There are several ways to obtain innovative ideas from customers and the following reflect areas that can benefit both the company and the customer. Areas highlighted include nurturing customer relationships, ethnographic research, connecting customer service with company designers, and establishing feedback loops.

Nurturing customer relationships may seem like an obvious component to innovation, but it is actually quite overlooked. Customers, particularly long-term customers, are likely to share information regarding problems, resolution, or new ideas. They are comfortable with how a company operates and trusts the business relationship. Customers that feel taken care of and valued oftentimes aid in innovation by asking for specific products or services to fit their changing needs. They may also provide insight into competitor products as any client watching a budget will continue to monitor the market for a better value.

Ethnographic research is also key in engaging customers. There is hardly a method of testing more powerful than having a product or service tested by the end user in the environment they would use it. The benefit for the customer is knowing the company really want to produce something that they can really use. When a customer is involved in the testing of the product, they feel part of the

Taking an internal approach to customer engagement is connecting customers with the teams that design their product or service. When customers have questions or

concerns regarding a product, they are instructed to contact a customer service or technical service representative. And while, the representatives provide a wealth of information regarding the product and return information, it would benefit customers to have an understanding on how/why a product was made a certain way. Designers and engineers can provide this detail for customers and also gain insight into how or why customers use the products. Rather than relying on intermittent survey data, hearing the voice of the customer is an invaluable step toward relationship building and innovation down the road.

Feedback loops other than just asking a customer what they want is crucial to obtaining new ideas. Very often consumers, maybe even the employees at the company, will discuss products and services in casual conversation. Hearing this type of feedback should be shared as it comes up rather than having to wait for a formal route of discussion. Formal and informal feedback should be considered equally when looking into improving a product or producing a new one.

An orange rounded square icon containing the text "Employee Involvement" in white, sans-serif font.

Employee Involvement

Employees are the lifeblood of a company. Having them involved in all aspects of their job and company allows for perspective, and subsequently innovation. Examples of this include devising a method of collective employee ideas, connecting employees with customers and suppliers, focusing on transferrable skill sets, and encouraging employee development.

Involvement begins with devising a method of collecting employee ideas. Shop employees who are physically making a product are ideally the ones to improve the product or process to produce it. Employees should have a means to submit their ideas for improvement. Company C conducts a program for employees to submit ideas for either something related to company products or something completely new. The ideas are reviewed by a team for feasibility and then if selected to pursue, result in the employee earning a bonus based on the money the idea generates or saves the company.

While internal employee involvement is important, employees should also develop relationships with customers and suppliers. Having connections outside of the four walls of the building provide another method of generating new ideas while strengthening a provider – customer relationship. Rather than employees being separated by a layer of sales and marketing personnel, they can attend customer or supplier events, sit in on meetings, or take tours of respective facilities.

This is even more true given the changing landscape of employment. Employees are staying at companies for less and less time, with five years now seeming like a long stay at a company. Moving from company to company may present challenges for employees who are trying to retain talent, but there are innovative positives that come from the nomad employees. These employees have had many perspectives and have the ability to adapt quickly to change and different environments. Companies should embrace employees with this type of background and apply their skill sets to areas of

need. This could include anything from working with tenured, lifelong employees on project teams to offering them a chance to revamp a stale process.

Mobile employees can introduce companies to different ideas, and due to the constant flux of short-term employees, the knowledge coming in always new. Utilizing transferrable skills sets should not be limited to internal development. With the growing acceptance or adjustment to shorter term employees, there are less bridges burned and increasingly a shift toward rehire. Along with this shift is maintained positive relationships with the employee and yet another access point for partnerships and ideas. Companies should value the professional history as it has contributed to the skills they will provide and possibly turn into a business relationship or collaboration on a product.

Encouraging employee development can hold a range of definitions. Specifically relating to innovation, development should always include ongoing training.



“Open innovation”, as first defined by Henry Chesbrough in 2003, “is a paradigm that assumes that firms can and should use external ideas as well as internal ideas, and internal and external paths to market, as the firms look to advance their technology.” Methods to incorporate open innovation include diversification, social media, network models, and conscious planning.

Midsized privately held companies, like the ones followed, may be at an advantage when it comes to open innovation. Regarding size, they are in a sweet spot of being small enough to have control over processes and new initiatives, but large enough to allocate resources for support. As a privately held company, they are not limited by shareholder direction and have the flexibility to establish relationships with both public and other privately held companies with less red tape.

While companies can naturally pull ideas from their closest inputs (employees) and continue using established sales channels to market, how do they and where do they get the external ideas and paths for them?

The first toe-in-the-water way to obtain external ideas is from customer feedback. This may seem like common sense, but the obvious options are generally the ones that are underutilized. The relationship between a company and its customers must be more than one of buyer - seller. In most companies, sales may establish the relationship, but customer service is the one who preserves it. They are the ones to hear when anything and everything goes wrong. And in those conversations, customers often recommend or request how something can be improved. This type of feedback ideally should be shared frequently with those who originated the product or service. The ideas that come from customers should never be underestimated. Oftentimes comments are answers to questions that have not been asked yet.

Company C showcases this type of open innovation. The company has both Customer Service and Technical Service representatives that field calls respective to

their product lines. Communication is ongoing between them and engineers in order to obtain exact information with a quick turnaround. The CS / TS staff continue to train and learn as much as they can about the product lines in order to be resourceful contacts for the customers. And the customers appreciate it. Customers share information and ideas with the CS / TS staff and offer innovative product suggestions that again are shared with company employees. Some are taken into consideration and others are used for across the product line changes.

Obtaining information from customers for the basis of innovation can be either passive, like in the customer service route, or active, such as in surveying for specific information. Meeting with customers after they have purchased a product or used a service a company provided can move beyond a follow up and turn into a new resource for ideas. Customers want to get the best value for their money. One way they do that is by letting a company know what they want, how they want it, and how much it should cost. Regardless of what menu of options they are presented, there is usually a request for something that a company may not currently offer. Those requests can be used to facilitate discussions with customers and potentially applied to existing products or new ones. Tapping into customers is one of the easiest ways to learn about market changes, product needs, and ultimately innovative ideas.

Using other sources such as customers is one way to diversify. Another is to diversify by products and services. Much like major conglomerates, looking into other products can edge a company into new technologies. Adjacent products or completely

unrelated products may use a process or technology that could be applicable to improving current product lines. There are many examples of R&D teams or student researchers trying to solve one problem, but ending up developing something that solves another. Diversifying products, services, and processes is an effective approach to innovation.

It is nearly impossible to talk about open innovation without mention of social media. Thanks to survey websites, forums, blogs, and media sites specific for industry feedback, there is a lot of information. While companies need to use caution when reviewing comments and complaints that are randomly forwarded to their attention, sorting through the perpetual commenters can lead to truthful information that legitimately represents consumers. Social media is a powerful tool. Having instant access to customer service, product information, or a company resource gives companies direct, time-sensitive feedback. Consumers continue to respond quickly as they too want to be heard.

A fascinating part of social media is that consumers share information out of interest and can provide answers to questions without being asked. To clarify, social media provides an outlet for anyone and everyone to share ideas. When companies rely heavily on the trained professional in a specific area to develop a new product, they should also consider those not trained but have a shared passion for said area. Passion for a product or service is shown by consumers and by many of them using social media. Utilizing this dynamic resource is crucial to open innovation.

Open innovation involves conscious planning. Companies need to plan how to use the different avenues to their advantage and be flexible to the changing landscape. What works this year may not work next year. Review of how open innovation is positively impacting the company should be constant. It should be utilized as part of a company's innovation process as it makes sense to have various inputs for innovation rather than putting all the eggs in one basket.



The final and one of the more critical influences in the innovation formula is the component of professional and social responsibility. Areas of focus include University partnerships, technical conferences, the concept of people following people, and the ability to lead by example.

Just as necessity breeds innovation, universities feed innovation. Companies rely on quick concept to public introduction to meet customer demand. That cycle does not lend itself to in depth, long-term research. Enter a university into the equation, and the answer to getting detailed knowledge of technology is found. While companies may initially be turned off by the red tape or information sharing that can occur with industry-university collaboration, it is a worthwhile endeavor. Universities have dynamic and financially stable investments in innovation. With an increasing awareness of collaborative projects and the development of innovation centers, a large pool of resources is available and all in one place. Companies can partner with universities on projects or just learn the technology that the university has intently worked on to aid to

a new process or product. This allows companies to step in as needed to apply a technology and quickly move to market.

Part of professional responsibility is contributing to the industry in ways that extend beyond business. Employees, let alone the companies they work for, should actively be involved in associations that can benefit them. Something as simple as attending a technical conference can give a company a new industry perception. Conferences provide an outlet for industries to share information, ideas, challenges, and the opportunity to work together. New technology, presentations, and white papers from universities and research institutions are easily accessible, along with the resources that provide them. There is much benefit to participating in conferences, both as an attendee or a presenter. Innovation can come from anywhere and it would be detrimental not to explore it this way.

Returning to the topic of shorter term employees, the relationships that cultivate from contributing employees have an indirect effect on innovation. When an employee has maintained a positive relationship with former employers, customers, and suppliers, they have a level of trust that overrides one that is newly established. People follow people, not companies. It is advantageous for an employer to support those relationships as they lead to intercompany collaborations.

Professional and social responsibility would not benefit innovation if a company did not lead by example. Companies that actively engage in new programs, send representatives for new training, and become early adopters are seen as innovative

companies. Taking risks and staying on top of new technologies attracts other companies and gives employees confidence to try new things.

Chapter 6

Recommendations

Companies are facing increasing pressure to innovate to stay viable. Mid-sized privately held companies need a formula for innovation. Derived from ideas that came out of the case studies, the following components of customer engagement, employee involvement, professional and social responsibility, and open innovation can benefit this group of companies.

Mid-size privately held companies should use their size and privacy to their advantage. They can look into different technologies and try them without having to share the information to vested owners. Success or failure of a trial is not recorded with the public, giving companies time to explore different options.

The innovation formula components and subcomponents are not an all-encompassing solution for privately mid-sized companies, they are a guideline of areas that can benefit their companies. Each of the components takes time to develop, and even incorporating just one area can be rewarding for a company's innovation process.

REFERENCES

Byers, Thomas H., Dorf, Richard C., and Nelson, Andrew J., "Technology Ventures From Idea to Enterprise," 3rd edition, 2011.

Martinez, Michael, and Newsome, John, CNN, "Crowdsourcing volunteers comb satellite photos for Malaysia Airlines jet," <http://www.cnn.com/2014/03/11/us/malaysia-airlines-plane-crowdsourcing-search/>.

Nambisan, Satish, and Sawhney, Mohanbir, "The Global Brain," 2008.

Snidermann, Brenna, Forbes, "Three Things Mid-Size Companies Do Better," <http://www.forbes.com/sites/forbesinsights/2012/04/20/three-things-mid-size-companies-do-better/>.

Ulrich, Karl T., and Eppinger, Steven D., "Product Design and Development," 5th edition, 2012.

<http://innovtoday.wordpress.com/2012/05/05/privately-held-v-publicly-held-companies-drive-two-different-types-of-innovation/>

<http://www.innovaionexcellence.com/blog/2014/02/03/how-tnot-to-innovate/>

<http://www.thefreedictionary.com/innovation>

<http://www.economist.com/news/business/>