



IMPORTANCE OF OPPORTUNITY RECOGNITION WITHIN INNOVATION



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Table of Contents

Introduction	3
Existing Commercialization Model.....	4
Enhanced Commercialization Model	5
Innovation Focus	5
Dedicated Funding and Long-Term Strategic Renewal	6
Ad Hoc Funding and a focus on Short-Term growth.....	6
Foundational Preparation	7
Individual Experiences	7
Understanding Science Push vs Market Pull.....	7
Organizational Learning and Collaboration	8
Hiring and Staff Retention	8
Idea Knowledgebase and Analytics	9
Measurement Function	9
Opportunity Recognition	9
Incubation	10
Insight.....	10
Quality Check	10
Prioritization.....	10
Defer to Idea Knowledgebase.....	11
Reject	11
New Feedback Loops	11
Feasibility Analysis	12
Product vs License Review	12
Project Plan.....	12
Product Commercialization vs Licensing vs. Commoditization	12
Conclusion	13
Appendix.....	15
Initial Commercialization Model (Figure 1).....	15
Proposed Innovation Focus (Figure 2).....	16
Proposed Commercialization Model (Figure 3).....	17
References	18

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Introduction

Most companies strive to be innovative. However, innovation without the concurrent ability to commercialize those ideas results in an inefficient use of personnel and capital resources. Many great ideas never make it to market because companies do not challenge their workforce to innovate; rather, they utilize their workforce to execute operations. Effective use of hiring practices, internal training, cross-pollination of ideas, and support mechanisms can turn an entire organization into the Internal R&D function for a company. Underfunding innovation results in small incremental improvements to a product line unlikely to attract consumers for the long term. All the while, competitors focused on innovation are able to introduce new or vastly improved products and services at a faster pace to quickly acquire market share.

Commercialization begins with an idea coming from any number of sources. An individual recognizes that the idea has the potential to meet a market need and a formal feasibility analysis is performed to understand the scope of the opportunity. A project is undertaken to actually take the opportunity to market if the return on investment and growth potential make financial sense. This Knowledge Sharing article focuses on exploring the most abstract of these components: Opportunity Recognition.

What makes Opportunity Recognition so abstract? Although it relies upon the organization for support, true “enlightenment” happens in the mind of the individual acting on behalf of the organization. It requires certain skills and aptitudes that only individuals can possess. Together, the collective skill set represents an organizational knowledge which is the foundation for Opportunity Recognition. Nurturing and attaining these soft skills allows for Opportunity Recognition, but for many companies, these skills do not represent hard assets worth investing in. This article explains why these skills are important, and why the failure to invest in individuals able to recognize opportunity often translates into incremental and unimpressive products.

Lastly, the article will recommend an enhanced Commercialization Model based on the Product Commercialization Cycle designed by WPI’s Professor Jerome Schaufeld. The new model greatly expands the Opportunity Recognition component, adds foundational dependencies, emphasizes the limits imposed by organizations, and inserts additional linkages to existing components fed by the new Opportunity Recognition enhancements. It aims to help companies of all industries strengthen their innovation focus in order to become more profitable and to achieve and maintain competitive advantage.

Existing Commercialization Model

Commercialization is the introduction of a new product or service to the market. A commercialization cycle describes the process that a product or service takes, from the initial innovative idea through to the execution of selling that product or service. There are multiple models which attempt to explain commercialization through division of steps into logical components. This article's proposal is derived from the cycle developed by Professor Jerome Schaufeld of WPI (Appendix Figure 1).

The existing commercialization model is a high level flow broken into five components:

- Sources
- Opportunity Recognition
- Feasibility Analysis
- Approach
- Project Plan

Each component of the cycle ties back to the overall vision of the company. This ensures that each innovation plays within the company's intended strategy.

Ideas can be derived from licensed intellectual property from universities and other sources, internal R&D, logical market extensions to existing products, Mergers and Acquisitions, and other new inventions. The point where the idea is identified as a possible opportunity is called Opportunity Recognition.

The idea is analyzed as part of a Feasibility Analysis to ensure that it has the potential to generate profit for the company. During the Feasibility Analysis step, risks, costs, benefits, and required resources are all explored, the market is assessed, and organizational impact is examined. The Feasibility Analysis results in a decision regarding the Commercialization Approach which will include deciding between Startups, Licensing, Joint Ventures, Franchises, or other methods of execution depending on capability. Once an approach has been selected, a Project Plan is created to get the innovation to market.

The proposed model will focus primarily on Opportunity Recognition, the most important component of Commercialization. While each Source has distinct features and each Approach has its own risks and benefits, there is a limited number of Approaches and Sources to select from. Feasibility Analysis and Project Plan Management can both be performed in a repeatable

and methodological manner. Companies can create an effective and consistent decision-making mechanism by surrounding these four components with processes and procedures tailored to company goals. Due to the repeatability of these components, they can be divorced from the individual and any employee performing a role focused on these components can follow the procedures to make appropriate decisions. Opportunity Recognition, on the other hand, cannot be divorced from the individual. Although this is true, subcomponents with associated procedures can be implemented to build a support structure to help make individuals successful. This drives the overall goal of increasing the probability of success for selecting a marketable venture.

The proposed model will explore additional subcomponents within Opportunity Recognition to improve recognition within an organization. Additional subcomponents are suggested within the Feasibility and Project Plan components to integrate with these new Opportunity Recognition features.

Enhanced Commercialization Model

Innovation is important for every company, but there is no “one size fits all” implementation. Each company, division, or group may find approaches that work best for them based on their size, industry, or maturity. The model has thus been built as a framework to allow for these differences and can be implemented to fit the most simple or complex requirements. Some phases will lend themselves to being performed by individuals in parallel while other components are geared toward group activity or committee decision, but each company can implement the framework in a manner suited to its situation. Participation in each component can occur on an ad-hoc basis, involve permanent positions, or feature fixed-term membership rotations to ensure fresh skill sets. The appropriate mix will change in line with dependencies outlined in the Innovation Focus.

Innovation Focus

The first modification to Professor Schaufeld’s model is replacing the Vision with an Innovation Focus (Appendix Figure 2) which provides a suggested level based on capability. The proposed approach allows for disruptive innovation whereas the Vision component ensures each step of the model plays within the strategy imposed by executive management. New ideas which may redirect the Vision to a broader or different path are not possible in the original model. The new approach allows for new ideas but has suggested limitations intended to ensure successful execution based on resources and funding. While attempting to operate outside the suggested

levels is possible, it is difficult due to competing operational priorities without necessary support and ownership.

Additionally, although capability is the governing factor of the Innovation Focus, a Breakthrough Gauge has also been incorporated to ensure some level of attention to strategic renewal. The Breakthrough Gauge is an important enhancement for operating outside the general focus to ensure some level of attention on game changing activity based on a percentage allocated by upper management. Otherwise, unfamiliar though potentially profitable opportunities are likely to face strong opposition in favor of existing products or services and thus fall through the gaps of operational processes. (O'Connor and Rice 108)

Funding and support, according to Sadasiva Prathab, EMC IT's Director of Innovation, are often more important to driving innovation through commercialization than the idea itself. Stephen Todd, EMC Fellow and Director of EMC's Innovation program, agrees, and not only with funding of the breakthrough idea, but also funding the inventor's move out of existing responsibilities to bring the idea to demonstrable form for executive approval and further funding.

Dedicated Funding and Long-Term Strategic Renewal

Focused ownership and significant dedicated funds allow companies to build potentially disruptive businesses by entering new growth domains, discovering uncharted opportunities, and blocking potentially disruptive competition. It requires considerable capital, staffing, and sponsorship by top management. (Wolcott and Lippitz 71-82) It allows for strategic renewal or refocus by enabling long-term strategy to change while also focusing on short-term profitability. (Lumpkin and Lichtenstein 451) Diffused ownership brings the focus down a level. Adequate support allows employees to explore new lines of business as long as they fit within strategic goals. Insufficient support causes potential innovations to clash and often be overridden by established business goals. (Wolcott and Lippitz 71-82)

Ad Hoc Funding and a focus on Short-Term growth

Focused ownership without dedicated funding ensures innovations revolve around developing existing lines of business due to limitations in budget. This, to a large degree, limits growth to incremental enhancements as opposed to breakthrough innovation. Diffused ownership without dedicated funds requires that the recognizer of an opportunity pursue his idea through his own technical ability and informal networks, otherwise deferring the idea until funds or sponsorship become available. (Wolcott and Lippitz 71-82)

Foundational Preparation

Lumpkin and Lichtenstein break up Opportunity Recognition into a Discovery Phase containing Preparation, Incubation, and Insight. The Formation Phase, which includes Evaluation (Feasibility Analysis) and Elaboration (Business Plan), will only be discussed where related additions stemming from the Opportunity Recognition enhancements lead to changes in these areas. (Lumpkin and Lichtenstein 457) The new model suggests Preparation is not part of a sequential function in line with the other components of the model, but rather a foundation upon which all activity relies. It thus takes its place along the breadth of the framework to signify its importance and its affect upon various components. This foundation is built with individual experiences and supporting organizational programs.

Individual Experiences

Past experience with market knowledge (target markets, general industry, and customers) and technological knowledge allows an individual to understand the potential feasibility of an idea or to create an idea which may fill some need. It allows the idea to make its way to Incubation by an individual for further review because there is some idiosyncratic characteristic of a group which can manifest itself in the need for the idea. Whether attuned to these needs consciously or subconsciously, the inventor recognizes an opportunity. In some cases, the business opportunity is not entirely clear, even after an idea becomes patented. This is especially true in innovative rather than imitative change and speaks to the need for organizations to grow their internal recognition capability by hiring the right individuals. (Siegel and Renko 797 – 816)

Understanding Science Push vs Market Pull

Discoveries without obvious market need are often dubbed as “Science Push” because the new technology is in search of a market whereas those derived from new market requirements are called “Market Pull” as the target market is easily identifiable. Individuals who can marry the “push” and the “pull” can make the difference between a company which merely exists and one which excels. They are able to identify how a new breakthrough can be predicted to replace an existing technology or open the market to a new unforeseen need. They have the capability to see opportunity in changing technological, regulatory, political, economic, or social trends to redefine the existing landscape. According to Siegel and Renko, there are three hypotheses which espouse the importance of Organizational Learning in order to maximize opportunity recognition: (Siegel and Renko 802 – 803)

1. The greater the technology knowledge in a new venture, the larger the number of recognized entrepreneurial opportunities.

2. The greater the market knowledge in a new venture, the larger the number of recognized entrepreneurial opportunities.
3. The greater the market knowledge in a new venture, the stronger the relationship between the level of technological knowledge and entrepreneurial opportunity recognition.

Organizational Learning and Collaboration

Cognitive Learning focuses on content learning and is the process that improves the creation of knowledge, utilization of knowledge to improve creativity, and quality of interaction. Lumpkin and Lichtenstein propose that the more the firm engages in cognitive learning, the more effective they will be in the Discovery phase of Opportunity Recognition. (Lumpkin and Lichtenstein 461) The cross-pollination of knowledge by placing individuals into new environments allows cognitive learning to take place in ways that standard training classes would not be able to provide with the added benefit of developing divergent thinking and cross-fertilization of ideas across various business units. (O'Connor and Rice 110) EMC's Stephen Todd echoes the importance of cross-division collaboration to allow for synergies across product platforms to be realized and to strengthen organic innovation within internal R&D. In addition, for further collaboration, companies should promote and nurture informal networks as a means to promote Opportunity Recognition. Such networks help to ensure Opportunity Recognition occurs at multiple levels of an organization. (O'Connor and Rice 107)

Hiring and Staff Retention

Cognitive development of existing employees is not sufficient to retain an effective base for Opportunity Recognition. Foundational Preparation also requires that hiring practices be modified to recruit entrepreneurially minded individuals with the appropriate skill set. Clayton Christenson, in his book *The Innovator's DNA: Mastering the Five Skills of Disruptive Innovators*, identifies the skill sets of Associating, Questioning, Observing, Networking, and Experimenting with an emphasis on individuals who have a demonstrated ability of more than one of these skills. Once hired, highly creative employees who have the ability for counterfactual thinking, mental simulations, or entrepreneurial awareness must be retained through exciting projects, recognition, and compensation. Preference is given to those who have developed a vast social network of internal and external colleagues or customers and those who have a keen understanding of both the customer and technology. These individuals can and should be identified through a measurement function to be discussed in a subsequent section. Retention

and recruitment is vital to support commercialization of new ideas that will define a company's business going forward.

Idea Knowledgebase and Analytics

There is an explicit need for an Idea Knowledgebase to ensure that deferred ideas with possible future applications get reviewed periodically, but also that ideas that become products also become part of the knowledgebase of data to ensure new applications for existing products are also explored. Furthermore, new ideas which can be combined with existing products can create a competitive advantage in the form of new features. Stephen Todd of EMC suggests that as more data becomes available about the success or failure of innovations, characteristics such as geography, market, and inventor become measurable factors by which to predict new innovation paths or help to identify improvements on existing ideas. Patricia Florissi, CTO for EMC Sales, stated in her lecture at WPI regarding Big Data, that data not only has one story, but many stories and that the patterns discernible within the data allow for predictive models to be created. The Idea Knowledgebase with the associated Analytics enables inventors to channel their creativity toward a logical direction which at first glance may seem illogical. It must be stated that the Knowledgebase does not prevent entirely new ideas from entering the Opportunity Recognition stream.

Measurement Function

Last, demonstrating monetary value for an innovation feeds both into Budget Planning for innovative departments and for inclusion into the Idea Knowledgebase as a target for analytics on which types of innovations are most profitable or fulfill the needs of the greatest number of customers. Additionally, showing that an innovative department saves or makes money in some way is important to signal the addition of more creative individuals to that department for cross-pollination of learning or to avoid being the target for reduction in force. It may indicate the need for possible escalation of individuals from that department to other troubled departments for enhanced performance and more balanced success across divisions as a hedge against economic failure affecting a single profitable division.

Opportunity Recognition

Opportunity Recognition is the process where individuals realize there is an opportunity to create customer value for an existing market need due to changes in market condition,

customer needs, technology, or social trends and can be divided into Incubation and Insight. (Lynch 4)

Incubation

Incubation is the intuitive, non-directional contemplation of an idea or a specific problem. (Lumpkin and Lichtenstein 459) The inner workings of the opportunity are examined against Market Needs, Customer Needs, Potential Major Market Shifts, Regulatory Changes, and New Technologies. Whenever possible, discussions are held with members of the inventor's social network to engage potential customers or other inventors to determine if the idea satisfies an existing need and customers would be willing to pay for the value. (Lynch 8) The inventor attempts to determine if the market is ready for this type of change or if the idea needs further refinement in preparation for a more advantageous environment. The inventor imagines bringing the opportunity to market and all the positives and negatives that may come with that activity. Additionally, the individual determines if the technology or process can be patented or whether it better serves the company through commoditization.

Insight

Insight is the point where the true identity of the opportunity becomes clear and answers to the questions asked within Incubation get answered. There is a realization that substantial business opportunity exists. (Lynch 10) Lumpkin and Lichtenstein refer to the moment of recognition as the "Eureka" or "aha" moment. (Lumpkin and Lichtenstein 459) If a problem cannot be identified which can be solved by the idea from the perspective of industry or society, it often exits the cycle by deferment to the Idea Knowledgebase.

Quality Check

The model is further enhanced through the addition of the Quality Check directly after Insight as an organizational verification of the value of the idea in today's landscape. The check includes prioritization of a verified idea, deferment if the technology or customer base is not yet ready, and rejection if there is no current or future feasibility or the idea already exists in another form.

Prioritization

Incremental low-risk innovations make up 85%-90% of company development portfolios but are unlikely to produce competitive advantage. (Day 1) The Prioritization component of the new model seeks to balance funding and focus Feasibility Analysis on Breakthrough or Disruptive ideas with a dependency on available funding and capability calculated through the Innovation Focus. Imitative and incremental change can be pursued with an understanding that the

greatest trap of a company is to continuously pursue this level of change, not that it fails at implementing disruptive change. Additionally, further exploration is performed to determine whether the idea can be transformed into a patented product, a non-patented product, a patent to license, or possible commoditization to derive other benefit and what priority should be given to ideas based on their characteristics and likely profitability. The formality of an IP review may reveal alternate strategies for commercialization.

Defer to Idea Knowledgebase

The true importance of the Idea Knowledgebase came to light during the conversation with Sadasiva Prathab who highlighted that an idea is not always pursuable by the individual who had the insight. Until the individual attains the knowledge to bring the idea through the process, or other more technically savvy individuals can take the idea further, it must enter a holding pattern much like the Hold portion of the original model. Oftentimes, the inventor's Foundational Preparation is insufficient to paint a true picture of the opportunity. The new model allows others to access and recombine ideas within the repository giving adequate recognition to all involved. (Siegel and Renko 797 – 816)

Reject

An idea that will never be feasible or already exists in some form in our ecosystem or owned by a competitor is likely to be rejected without the need for participation in an active review cycle of deferred ideas. The rejections will be part of the Idea Knowledgebase as analytics can be performed to predict likely future rejection of new ideas based on similar metadata or the seed for new further developed opportunities.

New Feedback Loops

The model proposes the addition of an Idea Review to periodically review ideas within the knowledgebase to ensure that deferred ideas be reviewed for possible new opportunities. Execution of the Review will be company-specific depending on level of maturity and focus on innovation. Ideas with promise make their way back to Insight and the Quality Check. Additionally, the model proposes a New Use Exploration which ensures that any product which makes it to the end of Feasibility is also explored for new uses in today's landscape or for possible new uses in the future. These records make their way into the Knowledgebase for further review as part of the Idea Review to help spawn new products or product extensions.

Feasibility Analysis

Product vs. License Review

Three additional pieces have been added to the overall Feasibility Analysis section with ties to enhancements built into other components. The overt question of whether the company can sell the product leads to whether the company pursues product creation through a project plan, pursues possible licensing, or a combination of the two. The license review can lead to license-related project plans or a return to the Idea Knowledgebase for future review.

Project Plan

Product Commercialization vs. Licensing vs. Commoditization

Examining licensing of ideas rather than turning ideas into products is an important enhancement to ensure that the right commercialization approach is targeted according to capability and profitability. Licensing patents can be an important source of revenue. It also allows for establishment of industry standards through willing commoditization to allow for other opportunities that arise from the commoditization. Additionally, by licensing patents to other companies, possibly including competitors, the firm may be able to recognize learning effects that by itself, it would not be able to realize and make further use of. (Lichtenthaler 69) Wayne Adams, Senior Technologist at EMC's CTO Office promoted the importance of commoditization. By commoditizing a technology and establishing a standard, a company can help ensure that its technology becomes the de facto standard that other companies in the space begin to use. This technology would already be known by the firm and competing technologies would be overridden through widespread adoption. It may open up other markets that would previously have been closed to the firm. He further clarifies that the value proposition is different between a commoditized product as compared to a closed platform. The open platform is value-add driven while the closed platform is cost driven.

Conclusion

Strategic renewal is integral to sustained company growth. There are only so many ways for a company to grow its bottom line and selling the same product to the same customers will not outperform competition in the long run. In fact, this approach limits growth potential. For companies to do more with less, they need to focus their efforts efficiently on products that customers will buy over something a competitor offers; thus the importance of commercializing innovation and implementing a defined method of selecting the best ideas upon which to spend limited funds.

Every company has a commercialization methodology. Some are effective. Some are not. Each has an element of Opportunity Recognition within it which embodies the realization that an idea can make it within the industry. The proposed model emphasizes the value of an Opportunity Recognition component and explicitly defined subcomponents. Equally vital are the interactions with other phases of the model and the feedback loops that ensure a cyclic strengthening of processes built around the model.

Balancing today's capabilities with tomorrow's strategic direction is easier said than done. Companies must recognize that disruptive opportunities lead to strategic renewal and sustained growth year over year. Organizations must enhance their capabilities until they can not only identify opportunity but successfully execute the commercialization of those breakthrough ideas.

The Innovation Focus aims to handle today's needs with tomorrow's goals. It is a model within itself and ties into Prioritization and other subcomponents of the overall model to ensure that a company continuously focuses on Strategic Renewal while also considering its fundamental capabilities derived from its current state of operations. The model forces an inherent understanding that for a company to grow its capabilities and pursue a greater number of potentially good ideas, support must be demonstrated through allocation of adequate funding and resources.

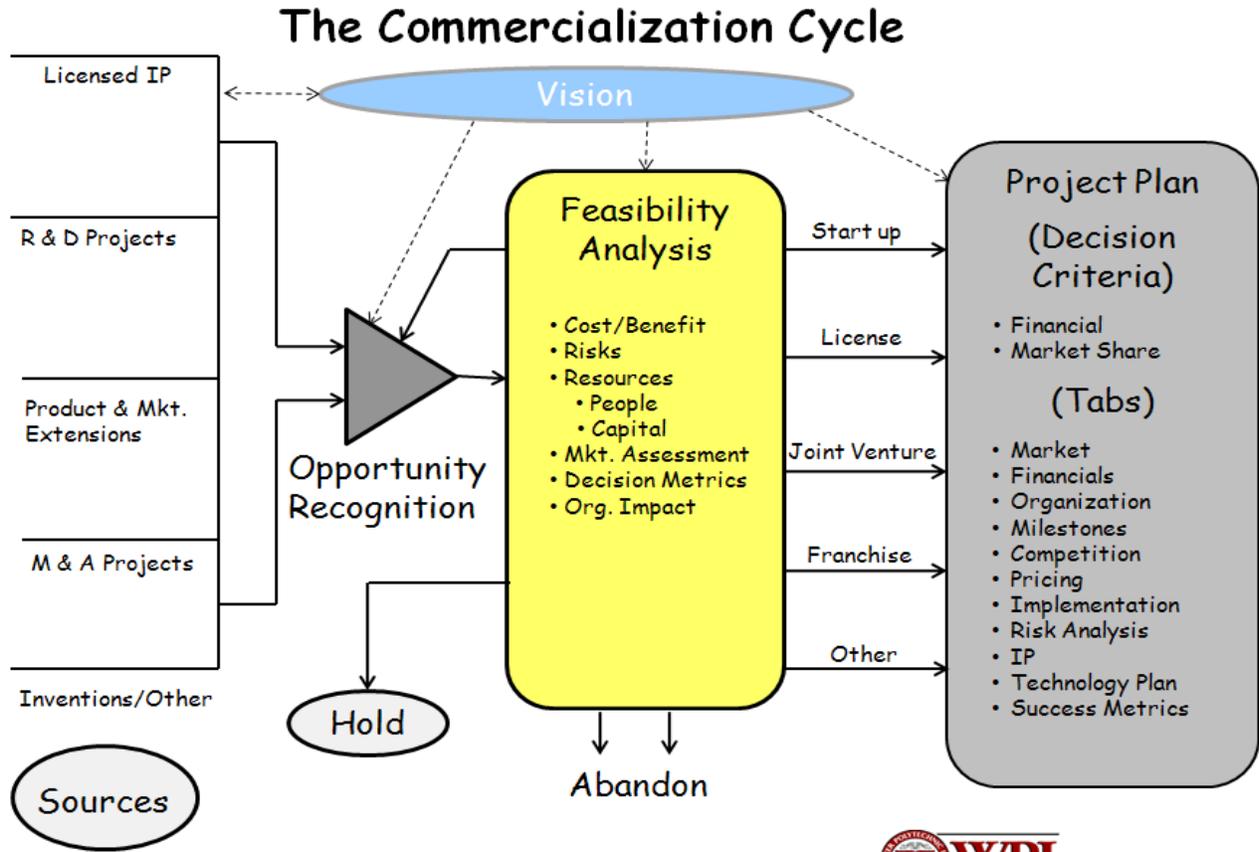
Efficiency and effectiveness are targeted through Quality Checks and Prioritization which allow for limited funds and resources to be allocated to the most promising ideas. The Idea Knowledgebase also targets the same virtues. Without such a tool in place, a company risks the possibility of promoting a great idea that is not yet ready or letting that same idea die. There is no middle ground. The continuous review of the knowledgebase allows for ideas not ready for

today's environment to stay in a holding pattern in case the environment changes and becomes favorable.

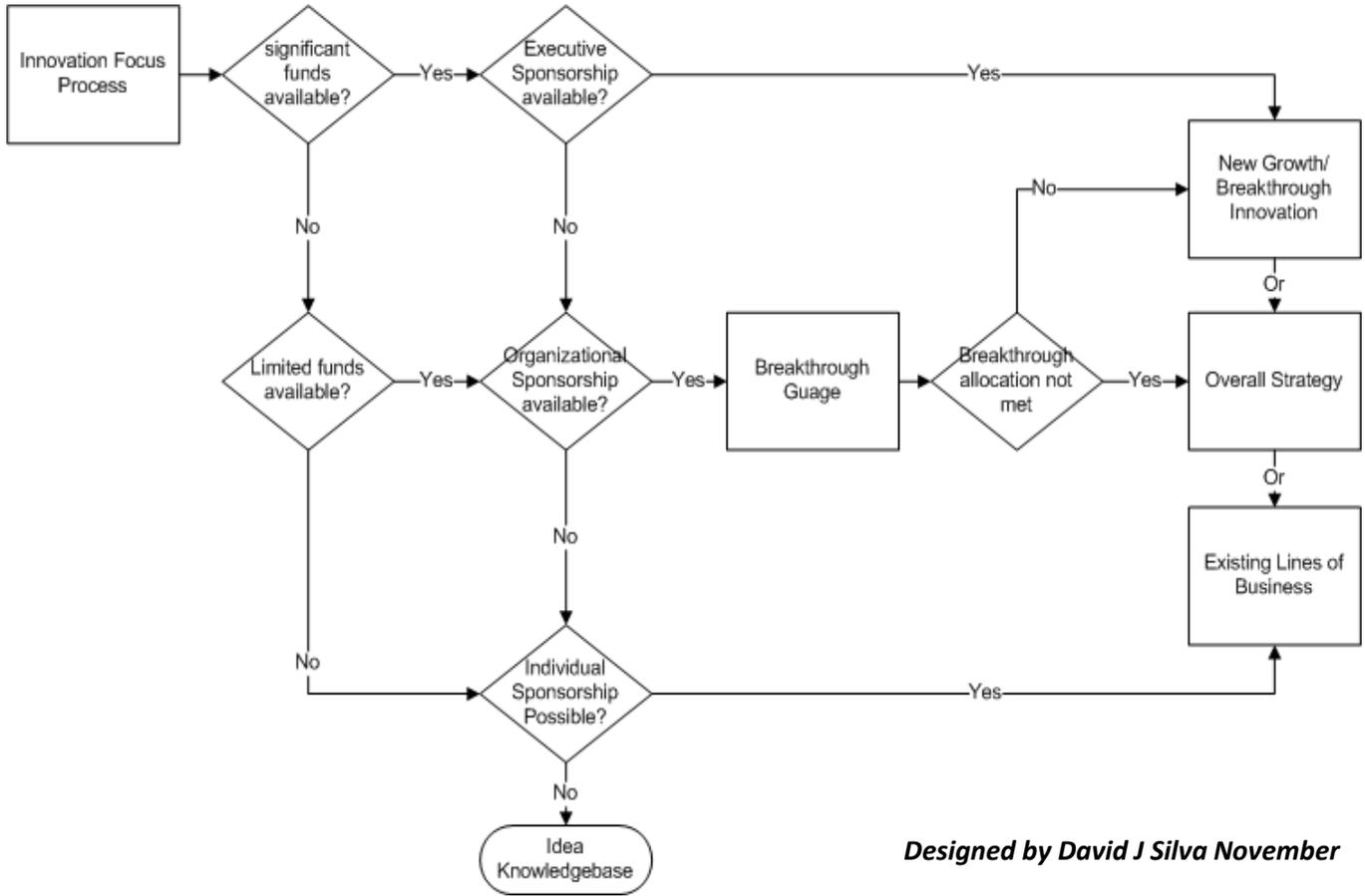
The most important differentiator between the proposed model and others is the emphasis on Foundational Preparation. Companies need employees with adequate foundational knowledge for cognitive association of seemingly disparate ideas. Companies need to attract and maintain a base of creative employees with counterfactual thinking, market knowledge, and supportive informal networks.

The global market increasingly rewards new commercialization strategies that are both disruptive and innovative. Effective implementation of the proposed Commercialization Model ensures that companies target the best ideas for new and existing markets, Strategic Renewal for sustainable growth, and enhance their capability to meet the demands of the market.

Appendix
Initial Commercialization Model (Figure 1)

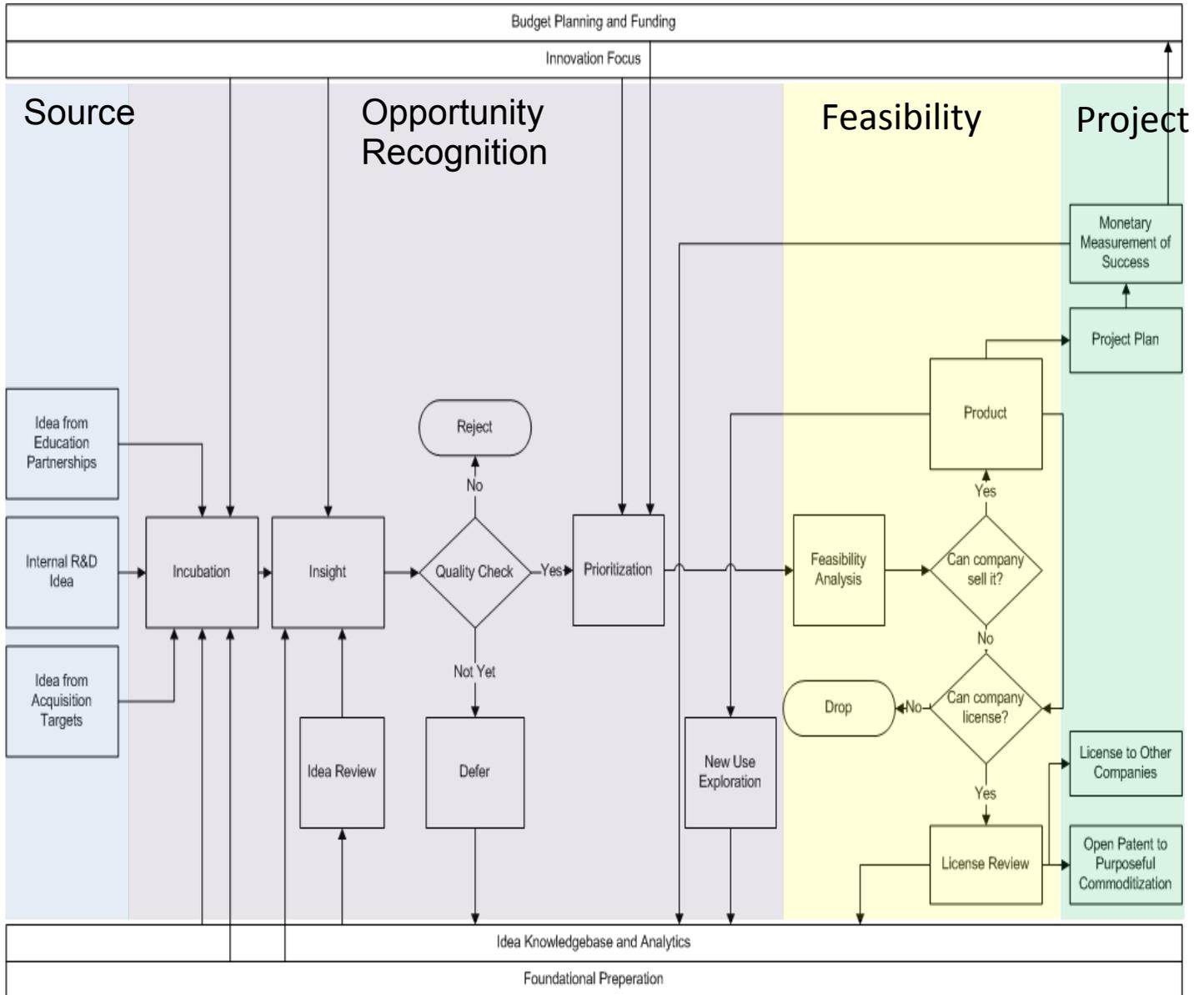


Proposed Innovation Focus (Figure 2)



Designed by David J Silva November

Proposed Commercialization Model (Figure 3)



Designed by David J Silva

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