

Lightning in a Bottle: Managing Ideas to Spur Innovation

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Academic Libraries and Innovation

Innovation is an important component of the academic library. In an environment where new technologies and resources are clouding the information world, it is essential for libraries to continue to be at the forefront of innovations impacting the information world.

Robin Bergart and M.J. D'Elia project that "if you take a look at your library's mission or vision statement, there is good chance you will find a reference to innovation".¹ And, in fact, a simple Google search for "library mission statement innovation" does indeed demonstrate that many academic libraries include the word innovation in their mission statements.

As higher education institutions increasingly adapt business models and strategies from the corporate world, academic libraries must do the same. This effort is already evidenced through recent publications addressing ROI and assessment of the value of libraries.² Libraries will also benefit from following the guidance of corporate practices when it comes to innovation. This paper seeks to review and organize much of the seminal research from the business and management literature related to innovation, specifically the portion of the innovation process that addresses the generation and management of ideas, in an effort to apply it to the academic library environment. Following this review, best practices will be suggested to help libraries improve the beginning of

the innovation process, commonly referred to as the "fuzzy front end".

Innovation Defined

What is Innovation?

Innovation is often used synonymously or in accompaniment with technological advancement. While new and improved technologies are innovations, the implication of technology when referring to the term *innovation* is too restrictive. Everett Rogers defines innovation more broadly as "an idea, practice, or object that is perceived as new by an individual or other unit of adoption".³ While more inclusive, this view of innovation is problematic as ideas are commonly seen as a component of innovation rather than as an innovation itself. Gerald Zaltman, Robert Duncan, and Jonny Holbek summarize two other contexts for the term *innovation*: (1) innovation as synonymous with the term *invention* and (2) innovation as the process of adopting something innovative.⁴ Semantically, these two contexts can be reduced to the difference between a noun and a verb, respectively. In the latter instance, innovation is used as an activity (i.e. "doing" innovation). Innovation as an activity is the process of innovating. In the former context, innovation is viewed retrospectively as the end result of this process of innovating. This paradoxical use of the term *innovation* as both the process and the end result has led to numerous variations in the definition of innovation.

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Types of Innovation

Most often, the notion of innovation as an end result brings to mind the creation of new products. This relates directly to Zaltman, Duncan and Holbek's first context of innovation as an invention. However, other types of innovation do exist, including *service innovations* and *process innovations*.⁵ This is important to keep in mind as these types of innovations are more likely to be produced by academic libraries, which often rely on vendors to create innovative products. In addition to product, process, and service innovations some innovations have larger social implications, referred to as *social innovations* or *paradigm innovations*.⁶ While it is unlikely (though not impossible) that an individual library would produce this type of innovation, social innovations have the potential to impact the way academic libraries function. Like product innovations, social innovations often affect or lead to service and process innovations. As Table 1 indicates, innovation types are not mutually exclusive.⁷

Type of Innovation	Library-related Examples
Product	Next-generation catalogs and discovery tools, Internet, iPad
Process	Assembly line, next-generation catalogs and discovery tools
Service	Twitter, next-generation catalogs and discovery tools, IM reference services
Social/Paradigm	Open access, Web 2.0, Creative Commons

The second means of categorizing innovation is in terms of its impact on the adopting unit. Innovations can be characterized as either incremental or radical.⁸ *Incremental innovations* are evolutionary in nature and focus on gradual improvement. *Radical innovations*, referred to as discontinuous innovations by Susan Reid and Ulrike de Brentani,⁹ have the tendency to change the processes and thinking for the adopting unit. Oftentimes, innovations do not take on their discontinuous nature until they have been implemented for some time. This is due to the S-shaped curve trend of adoption as presented by Rogers.¹⁰ As more users adopt an innovation, its potential to become discontinuous increases. For academic libraries, it is important to decide whether they wish to reinvent a certain

product, service, etc. (radical innovation) or make small improvements, keeping the same foundational principles (incremental innovation).

The Innovation Process

Regardless of the nature of the resulting innovation, the activity of doing innovation is frequently analyzed as a process. Zaltman, Duncan, and Holbek propose a model for the innovation process in organizations that consists of five substages: (1) knowledge-awareness, (2) formation of attitudes toward the innovation, (3) decision, (4) initial implementation, and (5) continued-sustained implementation. These substages are grouped into two main stages called the *initiation stage* (substages 1, 2, and 3) and the *implementation stage* (substages 4 and 5).¹¹ Other innovation models can be, and often are, divided to fit this two-stage scheme. The initiation stage deals with the innovation in an abstract way. Ideas and knowledge are shared to help form a clear understanding of what the innovation should be. The implementation stage is initiated when the idea for the innovation has been finalized and a decision to implement the innovation has been made.

The Fuzzy Front End

The abstract nature of the initiation stage has lead researchers and practitioners alike to refer to this stage as the *fuzzy front end*. The term was first popularized in 1991 by Preston Smith and Donald Reinertsen in their book *Developing Products in Half the Time*.¹² This stage consists of generating, collecting, adopting, clustering, screening, selecting, and improving ideas.¹³ Reinertsen views the fuzzy front end as a "precursor to a betting process... The purpose of the [fuzzy front end] is to alter the economic terms of the bets we place on product development".¹⁴ In other words, focusing efforts on improving the effectiveness and efficiency of the fuzzy front end can reduce the risk of failure and lead to more successful innovations. Peter Koen et al. see the fuzzy front end as one of the largest opportunities for making the innovation process more effective.¹⁵

This early stage in the innovation process must be systematically structured in order for innovation to succeed.¹⁶ However, Heinz-Juergen Boeddrich claims that many managers do not feel that this stage of the innovation process can or should be managed because of the creative nature of idea generation, a line

of thinking he refers to as “the fantasy route to innovation”.¹⁷ It is perhaps because of the belief that the front end of the innovation process cannot be structured that the fuzzy front end provides an opportunity for improving the innovation process. Of course, Boeddrich also warns against the over-structuring of the front end stage, referring to the other route as the “technocratic route to innovation”.¹⁸ Instead, a compromise between the two extremes is suggested.

As in Zaltman, Duncan, and Holbek’s segmentation of the initiation stage, the fuzzy front end can be divided into three main segments: (1) *idea generation*, (2) *idea development*, and (3) *idea selection*. While other variations of this model do exist, most represent this same basic structure with more or less specificity for certain segments and different terminology to describe each phase. In an attempt to apply the organizational factors of culture and structure to the fuzzy front end, Christiaan van Dijk and Jan van den Ende identify the three phases as *idea extraction*, *idea landing*, and *idea follow-up*.¹⁹ This model takes for granted the generation of ideas and skips directly to the sharing of ideas by employees of the organization. It assumes that the ideas which become innovations are already in the minds of those whom contribute ideas to the organization. While it has been shown that quantity of ideas alone does not necessarily lead to better innovations, overlooking the idea generation stage altogether can cause an organization to miss out on valuable opportunities.

Idea Generation

The idea generation stage provides an opportunity to both focus and motivate the creation of new ideas. Those who wish to achieve any type of innovation must encourage ideas and provide guidance for the scope of ideas. Koen et al. account for the need for guidance by incorporating two more stages into the fuzzy front end of innovation. In their New Concept Development Model, both Opportunity Identification and Opportunity Analysis precede the idea generation stage.²⁰ If innovation is taken as a solution to a problem, then the identification and analysis of opportunities is comparable to the discovery and sharing of problems that need to be addressed by an organization. Without an identified need or opportunity the process of generating ideas (and innovation for that matter) is merely self-serving. A study documented by Zaltman, Duncan, and Holbek deter-

mined that 75% of ideas are stimulated by identified opportunities whereas only 25% originated from previous knowledge which was then found to address a certain need.²¹ Identifying and analyzing a need for innovation allows individuals to generate ideas within a practicable set of boundaries. Not only do needs create a focus for idea generation, but it also serves as one of the main motivators for producing new ideas. In a survey of industry workers, approximately half of all respondents identified themselves as problem-solvers, 30% of whom said they were able to generate possible solutions as soon as the problem was identified.²²

While the ability to identify needs and problems is an important factor in idea generation, the ability of individuals and the organization to acquire and share knowledge is equally necessary. Michael Mumford et al. believe that the acquisition of knowledge requires expertise, and the complexity of most problems requires different forms of expertise. This makes collaboration an important part of idea generation.²³ However, a study by Karan Girotra, Christian Terwiesch, and Karl Ulrich found that working in teams was not the most effective method for producing high quality ideas. Rather, a hybrid process where individuals first generate ideas on their own and then share them in a group setting produced more ideas and higher quality ideas.²⁴

As important as the motivational factors are to idea generation, it is equally important to understand from whom new ideas originate. Langdon Morris identifies the generators of ideas as *creative geniuses*, who “work everywhere in the organization” and often are individuals outside organizations, including vendors, suppliers, and customers.²⁵ Jennie Bjork and Mats Magnusson stress that “the sources for innovation ideas cannot rely only on a few individuals”.²⁶ Rather, ideas should be encouraged from everyone. In corporations, these creative geniuses are often the front line workers who interact with customers and possess the ability to understand the reality of their environment and envision the potential for improvements.²⁷ They often do more than what is required from them as an employee as they seek out organizational problems and needs and investigate potential solutions.

Idea Development

The sharing of generated ideas marks the beginning of the idea development stage of the fuzzy front end

of the innovation process. This phase helps turn a raw idea that an individual creates into a mature idea that has the potential to be selected and implemented as an innovation. The creative geniuses who produce ideas often do not have the ability to turn their ideas into practicable solutions.²⁸ During idea development it is important for others, especially *innovation champions*²⁹, to work with the idea and help it involve into an implementable idea.

While suggestion systems are first and foremost a means of collecting suggestions from various sources, such as employees, the scope of their use has expanded to support the idea development stage as well. This is largely due to the increased use of information systems within organizations.³⁰ A successful suggestion system needs to offer a means for others within the organization to provide feedback on the idea with the intent of improving it and increasing its chance of implementation. The idea may not be shared with everyone immediately depending on the preference of the creative genius who generated the idea. Some may choose a smaller group with whom to initially share their ideas before presenting them to a larger audience. This is represented in Han Bakker, Kees Boersma, and Sytse Oorel's *Crea-Political Process Model*, which divides the individual's relationships within the organization into three separate organizational circles: intimate, professional, and managerial.³¹ Many individuals will choose to gather feedback from their immediate network (i.e. intimate) before distributing their ideas more widely.

Several models and diagrams exist for electronic suggestion systems.³² However, a system for managing suggestions does not need to be encompassed within an information system. While this is often a useful method to manage the idea development process, it is more important that ideas be shared widely, that the creative genius or those who champion the idea receive feedback, and that the developed idea fits within the goals of the organization and the requirements for a solution to the need being addressed (e.g. deadlines for implantation, budget, etc.). The idea development process is important as individuals are not always able to evaluate their own ideas well.³³

Idea Selection

Two potential scenarios exist for the idea selection stage: (1) the best idea must be chosen from several options, or (2) a single idea (without any competing ideas)

must be adopted or rejected. In either scenario, the end goal is to implement only the highest quality ideas. Idea quality is defined as a combination of feasibility and originality. The best ideas are typically creative but also grounded in reality in order to possess potential for implementation.³⁴ It is commonly believed that a higher quantity of ideas will lead to higher quality ideas. This is not necessarily true.³⁵ Rather, factors such as the creative genius' network centrality within the organization³⁶ and a hybrid brainstorming structure³⁷ lead to the production of the highest quality ideas.

The individual or group responsible for the selection of ideas for implementation may vary depending on the potential impact of the innovation. If the innovation impacts only the generator of the idea, then they may also be the decision-maker in the innovation process. If the idea has widespread impact, especially in relationship to labor and budget, it is important that the best idea is chosen. Girotra, Terwiesch, and Ulrich found that better ideas were selected by those who were unaware of the details of the process through which the idea was generated and developed.³⁸ This may be due to biases that the owners of an idea have toward it. Reinertsen identifies two potential mistakes that can be made during the idea selection stage: (1) a good idea could be rejected and (2) a bad idea could be accepted. The latter seems more likely to occur if an idea owners biases affect the decision process.³⁹ While rejecting a good idea is a lost opportunity, the acceptance of a bad idea can be far more costly. In the models of the innovation process discussed above, the selection stage is the dividing line between the innovation as an idea and the implementation of that idea. At this point, money, labor, and other resources are usually invested in the innovation. The fuzzy front end process has little cost and risk associated with it compared to the implementation process.

Suggestions for Libraries

Create Structure

As Boeddrich states, it is important to find a good compromise between imposing structure and allowing freedom for exploration during the fuzzy front end of innovation. A good place to start imposing structure is on those factors that affect the generation of ideas. Innovation leaders should make sure that channels are implemented so that both internal and external knowledge can be accessed by any employee who desires it. This includes sharing results from

formalized assessment, sharing usage data and other library statistics, widely distributing feedback from patrons and other external customers, and pushing out information about new trends and developments that may have an impact on academic libraries. This knowledge will help produce more informed and potentially implementable ideas, possibly avoiding some of the issues of creative ideas that Levitt mentions.⁴⁰

Committees

Oftentimes committees or other working groups are relied upon to generate (or discover) ideas and implement solutions within the academic library. However, as Girotra, Terwiesch, and Ulrich found, group brainstorming is not as effective for generating innovative ideas as a hybrid model.⁴¹ Thus, rather than beginning the idea generation process with a group brainstorming session, it is suggested that individuals are allowed (and even required) to generate ideas individually in advance of meeting and sharing ideas with the larger group. This will produce more variation in the proposed ideas, which may lead to a higher quality idea that may not have surfaced in a group brainstorm session where individuals are more likely to build on the ideas of others rather than suggesting potentially tangential ideas. The goal of effective idea generation, typically, is to produce one great idea; theoretically, it does not matter whether the other proposed ideas are good or bad.

In accordance with general practices for effective idea generation, individual idea generation should be informed by the factors mentioned above that help create focus in idea generation: budgetary constraints, deadlines for implementation, relevant literature and external knowledge, and a clear description of the problem or need to be addressed. Committee chairs or group leaders should provide this and any other relevant information to their potential creative geniuses well in advance of meeting as a group.

Identify Innovation Champions

The individuals who generate ideas are not necessarily equipped to carry out the implementation of the idea. As Levitt describes, they may not even be capable of turning their creative ideas into practicable ideas.⁴² The success of a raw idea requires the help of one or more people who possess knowledge of the library's strategic plans and values and are able to refine the idea in order to tie it to organizational outcomes.

These innovation champions are able to promote the idea in terms that help sell the idea to decision-makers.⁴³ They also tend to have a wide network within the organization, which allows them to gather feedback from various departments and get buy-in for the idea.⁴⁴ As either a creative genius who is generating ideas or an administrator attempting to get better ideas, identifying innovation champions within your organization is an unrecognized yet important task. Employees who fit the characteristics of an innovation champion should be encouraged to embrace this role and rewarded for their efforts.

Reward Great Ideas

Many companies provide monetary rewards for employees who generate ideas. This seems to occur mostly in companies that have invested in electronic suggestion and idea management systems. Beyond financial rewards, the implementation of an idea can be a big incentive for producing ideas. If employees and external customers feel their ideas are actually being utilized, they will be more likely to contribute more ideas in the future. Not implementing ideas can have the opposite effect of discouraging the generation of new ideas. As employees continue to suggest new ideas, their understanding of the need for rationality during the innovation process increases.⁴⁵ This increased understanding has the potential to transform employees who fit the creative genius role into innovation champions.

Conclusion

Innovation is commonly associated with risk and unpredictability, and failure is seen as a natural element of the innovation process.⁴⁶ However, libraries can improve their innovation successes and produce less costly failures by looking carefully at the fuzzy front end of the innovation process. The variety of needs to be addressed by the innovation process in libraries is too expansive to suggest one concrete system or model for managing the innovation process. More work should be done to investigate best practices that libraries can follow for each step in the idea management process. However, a review of the business and management literature on the front end of the innovation process indicates that libraries should encourage and seek out the generation of ideas from all employees and patrons; impose organizational structures to aid the flow of information, needs, and ideas; identify

individuals who possess the characteristics of certain innovation roles; and focus on putting forth mature, well-defined ideas for implementation.

Notes

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