

A practical idea creation, capture and management framework for innovation

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Statement of Originality

I declare that the work presented in the thesis is, to the best of my knowledge and belief, original and my own work, except as acknowledged in the text, and that the material has not been submitted, either in whole or in part, for a degree at this or any other university.

James Hornitzky

Abstract

Innovation is an activity essential to the success of individuals, organizations and wider society. Idea creation, capture and management account for a significant part of the innovation process, and yet have been widely disregarded by individuals, organizations and society. A small (and growing) number of individuals and organizations have begun to realize this and have moved to implement innovation frameworks in their own contexts.

These tools and previous work address innovation from an organizational standpoint. However, it is individuals that initiate, create, cultivate and implement ideas.

This thesis proposes a research-based framework that supports innovation which is instigated and driven by individuals. The key objective is to provide methods for structuring and sharing ideas, thus supporting innovators and driving the innovation process. The thesis develops the framework through analysis of existing tools, as well as a qualitative and quantitative analysis of innovator's practices and mindset.

In summary, this thesis presents a new paradigm of mobile open innovation that allows individuals to share and pursue their ideas with greater efficiency and ease. This new perspective in conjunction with the framework improves innovation practice and benefits the productivity of organizations and the world.

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1. Introduction

Realisation of innovative potential by individuals and organisations is critical to their success. As identified in the *Review of the National Innovation System* (Cutler 2008), individuals and organisations operate in a fast-paced knowledge-based economy that is driven by knowledge creation and innovation. The success of these entities impacts wider society; an innovative organisation or individual provides benefits to the economy and progresses human knowledge. This realization has formed the basis for Australia's innovation policy (Department of Innovation, Industry, Science and Research 2009), which acknowledges the foundational value of innovation in the global economy and outlines a path towards creating an innovative future.

However, while the importance of innovation is widely accepted, organizations and individuals still lack the processes and tools to realize their innovative potential. It is rare to find an individual or organization who has implemented structured processes covering ideation through to implementation.

So if ideation and innovation are so important, why do we, as individuals and organizational members, either lack or ignore the processes and tools to support innovation? Some common reasons include lack of publicity for innovation frameworks and processes, lack of support from those in positions of power, insufficient rewards and the fear of not receiving credit for an idea (Wood 2003). Given these reasons, in combination with the relative youth of the structured innovation management (SIM) market, it would be reasonable to assume that the unfamiliarity with structured innovation tools and practices is the primary reason behind the lack of innovation process and practice in organizations today.

However, after reviewing the literature it has become apparent that these problems, whilst important, hide a deeper and more serious issue. Research and much of the SIM market has widely disregarded the role of the individual in innovation. Many studies have either focused upon organizational-level innovation, or purely on individual creativity. Individuals however are rational beings that pursue ideas and innovation for their own gain in a multitude of contexts. Innovation is a concept that is broader than pure creativity or invention; it includes these as well as the complex interplay of people, collaboration, enhancement and implementation. Individuals are the heart of the innovation process; it is essential that we learn about their perceptions and practices across the entire innovation process.

This thesis develops an innovation framework based around the assumption that all individuals are ‘entrepreneurial innovators’; that they are passionate about their ideas and that they invest resources (time, effort and others) in creating, enhancing and developing ideas. By taking this perspective, we can uncover evidence of what is needed to create, support and sustain innovation. In addition, we propose a design of a software tool that implements this framework, and thus devote some of the thesis to examining existing tools and their underlying frameworks.

This document is structured around the development process of the new framework and tool.

Section 2 is a literature review that takes a holistic approach to the innovation process and aims to build an overarching understanding of the ‘art’ of innovation. This provides the background to the thesis and highlights relevant concepts and trends that provide the context for developing the framework.

Sections 3-5 contain information on the research method employed in the study, as well as the presentation and discussion of the results.

Sections 6-7 detail the new framework and its connection to existing organizational frameworks. The design for a tool, named *Innovatia*, that implements the framework is presented. Details of an early implementation are also provided within these sections. Ideally, this tool will become an open source project that individuals and organization can build upon and deploy in their own contexts.

Section 8 provides a summary of the work, as well future directions for studies and development.

Section 9 contains a list of references made throughout the document.

Section 10 contains appendices that provide supplementary material referenced throughout the thesis. Appendix A and B contain focus questions for the interviews and the questions asked in the survey. Appendix C introduces the code for the *Innovatia* prototype. Appendix D and E are structured innovation tools and alternative tool matrices that document the tools examined during the analysis phase.

2. Literature review

The review takes a holistic approach to the subject matter by examining related literature from diverse fields such as IT, business, law and design to develop a high-level understanding of innovation and to identify gaps in existing work.

The first section of this review examines existing literature around the process of innovation, and focuses on defining important terms and concepts. The second section explores current market products and trends; the state of the 'art'. In particular, this section reviews the open innovation movement and the implications that it holds for individuals and organisations. The third section discusses factors that affect individual's ability to innovate in their respective organisations and groups. The final section summarizes the findings of the review and presents the direction for further research.

2.1. Looking at the innovation process

'Innovation' is a 'buzzword' and as such an oft-misunderstood term. In the context of this thesis, Wood's (2003) definition of innovation is adopted. Wood defines innovation as the 'implementation of all ideas - big and small'. It signifies the power and centrality of ideas to the innovation process, and thus the majority of this review is focused upon the aspects of idea creation, capture and sharing for innovation. Also, while this definition of innovation encompasses the discovery and implementation of new ideas, it also covers the application of existing knowledge to new situations.

From the literature, the innovation process can be loosely defined as a series of three stages. These stages are a 'blend' of models presented by Cormican & O'Sullivan (2003) and Bothos, Apostolou & Mentzas (2009). The first is idea creation, in which innovators 'come up' with an idea. This is a highly creative phase that involves the innovator exploring their thoughts both in individual and group settings. The second stage is idea refinement and management, in which an innovator will refine their idea and weigh it against their other ideas. In an organizational environment this will involve determining the impact of the ideas and the envisioned benefits of the project. The third and final stage is implementation or realization of ideas.

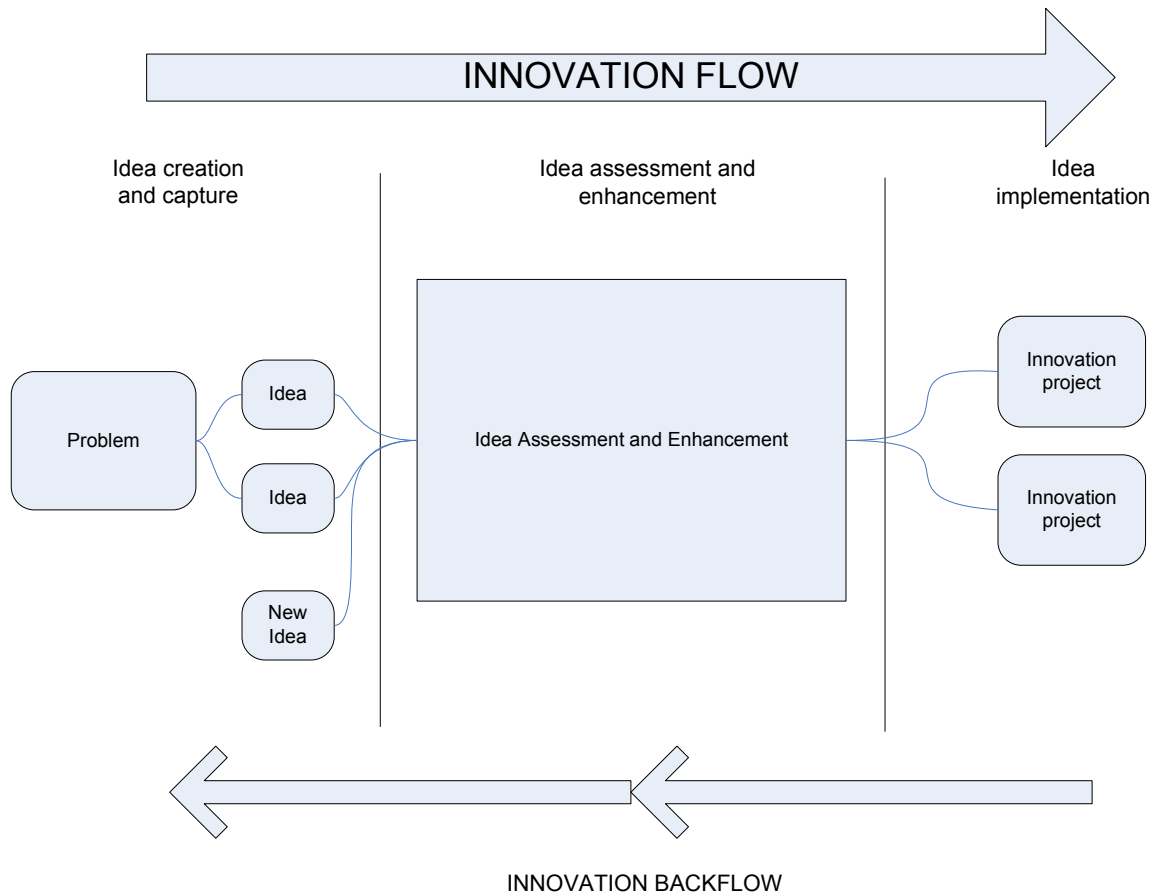


Figure 1 - The innovation process.

Three distinct phases of innovation are represented in this diagram. In the idea creation stage, new ideas are formed independently or formed from a problem. In the idea assessment and enhancement phase these ideas are discussed, rated and debated. In the idea implementation phase, ideas that have been confirmed as viable are turned into projects and realized. Note that each phase can 'backflow' into another. This model is a blend of earlier work by Cormican & O'Sullivan (2003) and Bothos, Apostolou & Mentzas (2009).

2.1.1. Idea creation and capture

The idea creation phase involves creative and lateral thinking. This phase involves creating new ideas and then capturing them in some form of logging system, which ranges from something basic as using 'pen and paper' to something as structured as a software-based idea management system.

Generally there are two main approaches to this phase; an ad-hoc (unstructured) approach, or a challenge-based (structured) approach.

According to Gamlin, Yourd & Patrick (2007), from an organizational standpoint, the challenge-based 'visionary' approach produces higher quality ideas. In contrast to the term 'idea generation' that is commonly used in the literature, the term 'idea creation' used in this review acknowledges that individuals have a degree of control over their idea generation. While the act of creative cognition is still a somewhat unknown phenomenon, techniques to direct cognition towards outcomes, such as solving a business problem, have been shown to be successful (Gamlin, Yourd & Patrick 2007).

Gamlin, Yourd & Patrick (2007) argue that a lack of structure in the idea creation process is akin to using a suggestion box, which has a number of disadvantages for the organization. They consider the unstructured approach to have two key weaknesses. Firstly, the ideas generated are not focused towards a specific goal or purpose. This makes it difficult for an organisation and to a lesser extent an individual to reliably solve their problems and to reach their goals. Secondly, in the organizational context these ideas are not 'owned' by a particular organisational group, making it difficult to drive their development.

Gamlin, Yourd & Patrick (2007) then present their view that challenges or focus areas deliver a set of higher quality ideas. They present a case study of an ideas challenge in an organization that delivered 240 ideas over the period of a month. These ideas were reviewed and ranked following the end of the challenge, of which 14 ideas were presented to the customer. Similarly Lamont (Lamont 2004) presents a case study of Canadian firm *Sun Life Financial*, in which a challenge that ran over a week delivered 528 ideas on time and cost savings techniques. It is important to note that both these cases promote a time-frame for the challenge to drive action. One criticism is that the use of a focused approach attracts more 'inside-the-box' ideas; however this is a matter for further research.

Flynn *et al* (2003) embraces a challenge-based approach by developing the 'Idea Creation Methodology'. Through an exploration of creativity literature, they develop a 4 step methodology for idea creation. These stages include strategic direction, environmental scanning, opportunity identification and idea generation. Blue Ocean Strategy (Kim & Mauborgne 2005) also delivers a similar approach through the '6 Paths' framework.

While the challenge-based approach to innovation delivers more focused results, it is important to remember that ad-hoc innovation can still deliver valuable ideas. There are also different types of problems (Judge 1971) with varying levels of structure. Some may not be easily quantifiable and the ad-hoc approach better suits unstructured problems.

Therefore, the new framework must account for both approaches to idea creation and capture. Events and idea challenges have been shown to deliver some of the greatest benefits, and the 'Idea Creation Methodology' (Flynn *et al.* 2003) serves as a solid starting point for facilitating idea creation. However, it is just as important to realize that the framework must support the ad-hoc ideas creation as these can also deliver significant 'one-in-a-million' innovations.

2.1.2. Idea enhancement and management

The idea management phase involves critically evaluating, refining and prioritising ideas. Collaboration becomes particularly important in this phase as it requires the employment of multiple perspectives and modes of thinking.

An important component of this process is the ability to create stable divergent thinking. As identified by Nemeth & Ormiston (2007), convergent thinking creates acceptance but constrains the creativity of the group. This is referred to as 'groupthink' (Janis 1972); the tendency of group members to produce the same ideas and conclusions. Obviously, groupthink is highly unsuitable for innovation as it is a process that requires a diverse array of ideas. However, it must also be moderated to prevent conflict developing between members (Milliken, Bartel & Kurtzberg 2003).

Ideas also need to be graded and categorized effectively. Cormican & O'Sullivan (2003) use the categorization 'Quick wins' to separate easy-to-implement ideas from those considered more complex. This complements the ability to use predefined categories and social tagging. While this categorization is useful in principle, it requires the establishment of criteria as to what defines a complex or simple idea. In a larger scale organization or public environment, it is important to develop rating scales to determine the idea's complexity and value. These criteria must map to the goals of the organization and individual.

While collaboration will deliver benefits to all groups, there are issues for smaller groups that do not have access to the same diverse array of perspectives and resources as in a larger group.

However, there are techniques that can improve the ability to assess and improve an idea. Hudson (2007) highlights a number of useful techniques. For example, Hudson proposes rewording of the problem and idea descriptions to enhance certain perspectives and thus present new opportunities. Similarly de Bono (1990) describes the technique of *Random Stimulation*, where different words or visual stimuli are ‘thrown’ at the individual or group to spark creativity. Such thinking techniques can also be applied to the idea creation and capture phase to increase the quantity and quality of ideas.

As an aside, a tool could provide a form of automated idea assessment and suggestions for refinement. Every time a new idea is submitted, a process could receive an idea entry and generate autonomous software agents which verify the originality and ‘value’ (as in to a specific individual or organization) of the idea based on predefined criteria. A simple example would be an agent that searches the internet for existing, similar ideas based on the content of the idea submission and returns a novelty rating¹. This complements the ability to use social rating and discussion features.

2.1.3. Idea implementation

This phase involves the realization of an idea. Generally the management of individual projects is very well established, with a number of tools and methodologies existing in the market.

However, there is an issue exposed when problems are encountered during the implementations phase. Particular problems, or even new ideas for features, may be uncovered during the project development process. There needs to be a method of capturing these issues and developing ideas to solve them. In essence, this activity feeds back into the start of the innovation process by defining new problems and creating new ideas. Hence an ideas framework needs to be able to create and manage an ideas hierarchy and a dynamic innovation process.

2.2. The current state of the ‘art’

The ‘art of innovation’ is in a cycle of constant innovation and evolution. To determine requirements for an innovation framework, it is essential to understand what other frameworks

¹ Credit for this idea goes to Sylvan Rudduck. In addition, this idea served as the starting point for many of the other agent features described in this document and *Innovatia* architecture.

and tools already exist and how they are used.

2.2.1. Existing tools

A number of different tools have been analysed in the literature. These are summarised in the table below. Note that many of these are organizations and communities that integrate software tools into their operational model.

Table 1 - Summary of tools presented by the literature

Name	Model	Focus	Reference
IDeM	Research	Information Aggregation Market sued for rating ideas to predict outcomes	Bothos <i>et al.</i> 2009
Innovation Xchange	Commercial	Matchmaking service for those requiring problems to be solved and innovators	Chesbrough 2006
NineSigma	Commercial	RFP negotiations tool	Chesbrough 2006
Big Idea Group	Commercial	Community for developing new ideas	Chesbrough 2006
Shanghai Silicon IP Exchange	Commercial	IP marketplace specific to semi conductors	Chesbrough 2006
Ocean Tomo	Commercial	IP merchant banker	Chesbrough 2006
Product Innovation Manager	Research	Idea manager for product innovation, very much focused on a commercial development cycle	Cormican and O'Sullivan 2003
Creations	Research	Idea creation tool for driving ideas to solve problems or achieve goals	Flynn <i>et al.</i> 2003
Imaginatik Idea Central	Commercial	Idea creation and management tool for enterprise	Lamont 2007
NextNet	Commercial	Idea management tool for enterprise	Lamont 2007

In addition, a small cross-section of other innovation tools was explored to gain a preliminary understanding of the other options available to innovators. Given that literature has not covered these tools suggests there is a significant gap in the field, and that there is a need for further investigation.

Table 2 - Other tools researched that were not presented in the literature

Name	Model	Focus	URL
Creativity pool	Free	Open free for all ideas forum	http://www.creativitypool.com/
IBM Thinkplace	Closed	Closed innovation tool for collecting sharing and tracking ideas	http://domino.watson.ibm.com/comm/www_innovate.nsf/pages/ourselves.thinkplace.html
Wridea	Free	Individual idea management and sharing tool	http://wridea.com
Ideas4All	Free	Open free for all ideas sharing community	http://www.ideas4all.com
Innovation Commons	Free	Open free for all ideas sharing community, supported by a number of organizations including the Indian government	http://www.innovationcommons.com

While each of these tools possesses characteristics of workspace systems (Hawryszkiewicz 2003), they all have features and nuances that support innovation in different ways. To better illustrate this point, one can compare the *Idea Central*, *Product Innovation Manager*, *Creations* and *IDeM* tools.

Idea Central is a web-based idea management tool developed by innovation consultancy Imaginatik. The tool presents a distinct innovation process with corresponding feature sets for each of the 5 steps. These steps are; challenge employees to create ideas, capture them, develop them collaboratively, select and filter out the best, and measure the performance of the innovation process.

Cultural integration was highlighted as a key feature of *Idea Central*. In one of the case studies presented, a senior manager was quoted (Lamont 2004):

“We liked the approach of IdeaCentral, because we felt the software took into account the behavioral and organizational issues working with idea management”

The importance of the software tool being able to adapt to organizational culture cannot be overemphasised and is an essential characteristic of any idea management tool.

Product Innovation Manager (Cormican & O'Sullivan 2003) and *Creations* (Flynn *et al.* 2003) are two similar tools that focus on guiding organizations through the idea creation activity. While each tool has a slightly different method, they both use the same model to describe the innovation process. While the tool is underwhelming in its implementation, it utilizes a well-defined and thorough process.

Finally, the web-based *IDeM* (Bothos, Apostolou & Mentzas 2009) platform provides a different method for evaluating ideas. As an information aggregation market (IAM), it is focused around making predictions using a market trading environment. This is a novel and useful way to evaluate ideas that could be integrated into the *Innovatia* tool.

Upon analysis of all tools, a number of common features emerged. These are:

The choice of platform: The web platform was almost uniformly chosen because of its standards-based distributed computing. This allows for communication with smart phones and portable web devices.

The basic features of each tool: As explained by Hawryskiewycs (2003), the basic elements of a workspace are common to any collaborative system. These include necessities such as

communication mechanisms, roles and so on. While each element is present to a varying extent, the basic collaborative functions are shared across all systems and are an essential part of the *Innovatia* tool.

An organizational focus: The majority of tools focus on a particular organization. However, there are benefits and ethical obligations in allowing users to retain ownership of their ideas across multiple contexts that are not covered within the market.

There are also some trends in the variations between each tool:

Specificity: A number of tools narrow their focus to certain domains. For instance, *InnoCentive* is focused on biomedical and high technology applications, where as *Atizo* focuses on open innovation for lower complexity common-knowledge problems.

‘Bells and Whistles’: A number of tools have secondary features that separate them from each other. Some tools have capture features such as audio and video. Some have a significantly different focus or method and as such provide features that are more drastically different to others. It is important to ascertain features that are useful so that the tool is as efficient and easy-to-use as possible.

After looking at these tools, one may ask ‘why develop a new framework and tool if others already exist?’ The majority of the tools explored in this review are commercial only, often focus on a specific aspect of innovation and do not have adequate of support for individuals. These factors leave space for an openly available individually-focused innovation framework and tool.

2.2.2. Open innovation

Open innovation is an emerging paradigm that evolves the ‘traditional in-house’ approach to innovation.

Traditionally an organization or individual kept its issues, research and intellectual property to itself. This ‘Closed Innovation’ paradigm leads to both slower development cycles and wasted intellectual property (Chesbrough 2003).

Open innovation, a term coined by Chesbrough (2003), is defined as a ‘paradigm that assumes firms can and should use external ideas as well as internal ideas, and internal and external paths to market’. It recognises that the best people often do not all work together in the same group and that if those groups look beyond their own context they can reach their goals with greater efficiency and effectiveness. The main benefits of open innovation include reduced time-to-market, higher quality output and therefore more innovative products and services.

Unfortunately many individuals and organizations have not yet tapped the power of open innovation. Despite Chesbrough (2006b) describing why closed innovation is no longer sustainable many organizations have not transitioned towards open innovation. Why is this so?

Hagel & Brown (2006) offer two reasons. The first is the confusion over open innovation. The authors explain that the majority of people will ‘jump’ to a naïve open source conclusion, which is typically associated with difficulty controlling intellectual property. This is an invalid assumption as open source (and open innovation) entails forms of intellectual property protection, in particular the use of software licensing. Open source protection can also serve as reference model for open innovation. The second reason is the lack of coordination techniques and knowledge about managing open innovation within an organization.

In relation to the framework and the *Innovatia* tool, there needs to be integration of and support for open innovation.

2.2.3. The innovation process in organizations

Many services and manufacturing firms lack well developed ideas and improvement processes. Innovation processes can be found in some manufacturing firms through examination of quality improvement processes such as Six Sigma (Pande & Holpp 2002), but none of these firms seem to adopt a holistic innovation approach.

At the opposite end of the scale, there are research and development (R&D) divisions and firms that are highly innovative. These R&D firms must have some form of process that cultivates their ideas. While a common process between all R&D firms is elusive, a key factor with these firms is their clustering around small teams. These small teams work closely together, reducing the need to use a tool to share and evaluate their ideas within the team. Arguably it is the culture and

structuring that plays the primary role in the R&D field. Similarly in university environments researchers are close-knit and share the same areas of expertise, making it easier to trade and develop ideas within the group.

However clustering around a small team highlights a key weakness. Sharing is a key part of innovation; it is not only sharing ideas within the group but sharing outside it. Intellectual capital does not reach its full potential if ideas are kept within the group; these ideas need to be taken to the 'outside world'. Also, as conditions and circumstances change, these ideas may become more relevant and useful at a later point in time.

It may be rational to believe that the greatest users of idea management tools would be R&D firms. After all, these firms rely upon their innovativeness to remain competitive. However, as seen in the case studies, there is a scattering of the tools through different organizational sectors. Innovation is important to all firms; firms that don't innovate die (Chesbrough 2006a).

2.2.4. Initiatives and intermediaries

There are a number of groups that currently work in open innovation. Two main categories are explored here; working groups and innovation intermediaries.

There are a number of working groups that are working within the open innovation space. These are summarised by the table below.

Table 3 - A selection of working groups in the open innovation space

Working Group	Area of focus	Publications	Site
Laboranova	Cross-university group researching software support for ideation and creativity	Bothos	http://laboranova.com/
User Innovation	MIT-led university research group into user innovation	von Hippel	http://userinnovation.mit.edu/
Open Innovation	Research group into the	Chesbrough	http://www.openinnovation.net/

Open Innovation EU	Cross-university/public group promoting open innovation in Europe	-	http://www.openinnovation.eu/
Australian Innovation	Australian public group on innovation	-	http://www.innovationaustralia.net/

Regions outside Europe and the US are under represented in the number of open innovation working groups. Ironically, in 2010 Asia Pacific and Latin America will lead the adoption of open source software, which is an inherent form of open innovation (Innova 2009).

The other key category is the ‘innovation intermediary’ as termed by Chesbrough (2006b), some of which were covered in the earlier tool review. There are two main types in the market today. The first are the commercial intermediaries. These innovation intermediaries are for-profit organizations that work with large companies to solve their problems by building a community of innovators. In contrast to this, there are non-commercial open innovation initiatives, which are also organizations that support innovators without the for-profit motive. These non-commercial intermediaries are an untouched field of research.

How do these groups integrate into the framework and the *Innovatia* tool? These various groups indicate that there are different models to work upon; different strategies and techniques. The second is that to truly realize the power of ideas they must be shared with others. The framework to be developed should ‘push’ innovators towards openness, which includes interacting with innovation intermediaries and groups.

2.2.5. Intellectual Property

As mentioned by Wood (2003) a major concern of individuals is that their ideas will be taken and used without their consent.

To circumvent this problem there are a number of intellectual property (IP) laws which assign ownership of ideas in different ways. Paradoxically, while these laws lead to the problem of individuals treating ideas as property and subsequently sharing with a chosen few, these laws also allow individuals to have confidence in retaining control of their idea and thus being open to sharing them.

In Australia, major forms of intellectual property protection include:

- Patents
- Trademarks
- Designs
- Copyright

Each type has a different purpose and thus a different area of protection. Note that in each country the laws regarding IP differ (although in many developed countries they do not stray too far from the same model).

Patents are the most common approach to protecting inventive ideas. However, patents are only applicable to novel, ‘useful art’ (*Legal Information: Patents*). Patents must be obtained in each country, which all have slightly differing patent systems. In addition the patent review process is long and costly, often taking years and several hundred to thousands of dollars.

Trademarks are also another method of protecting intellectual property. However trademarks relate to branding or marketing symbols rather than inventive or entrepreneurial ideas. This is similar to designs, which protect the shape of an object but not its operation. Copyright applies only to the expression of content, in this case an idea description rather than the idea itself.

Note that none of the IP mechanisms above directly protects all ideas. From a logical perspective, claiming ownership of an idea is extremely difficult to prove. Ideas can be created independently, so it can be very difficult to prove beyond the balance of probabilities that this is not so. Even the underlying concept of an ownership of an idea is somewhat ‘sketchy’. While patents, designs, trademarks and copyright present an established method of protecting ideas, they are expensive, time consuming and provide no incentive for further collaboration.

We can look outside the common forms of intellectual property rights (IPR) to the IPR present in the tools. Each of the tools examined presents a slightly different level of idea protection, most commonly through some form of contract. Most existing systems have a ‘terms of use’ policy that states the position taken with regard to IPR. This constitutes a legally binding use of services, which can be extended to idea protection. However this has not been tested in court due the rarity of such tools and communities.

Some other open innovation initiatives utilize a ‘free-for-all’ approach. This model has all ideas posted donated to the public domain. *Creativity Pool* is an example of this idea in practice. Note that in *Creativity Pool*, while ideas are not explicitly protected there is a feature that allows the idea creator to indicate what they would *like* as a reward, thereby creating a ‘weaker’ form of idea protection through social obligation.

Other open innovation initiatives include a form of user agreement that prevents users from ‘stealing’ ideas under the ‘terms of use’. *Ideas4All* adopts this approach. This is a positive approach because it gives organizations and individuals a basis for IP protection. However ownership is still difficult to prove and enforce in the legal arena, even if viewing logs and user registration details are captured. An extension of this idea is to implement an idea licence, similar to the various licences for software. *Ideas4All* allows idea creators to choose between two licences, but these are very similar and weak. Any licence is also dogged with enforceability issues.

The third and final approach is to restrict access to the idea or challenge. The innovation intermediary plays a pivotal role in mediating the access to information and the sharing of intellectual property between the groups. *Innovation Exchange* and firms that cater to large organizations typically adopt this approach.

IPR is a major issue affecting the willingness of innovators to share their ideas. Thus flexibility in IPR including the adoption of some of the different approaches described above is paramount to the success of the framework and the *Innovatia* tool.

2.3. The effect of organizational culture

Organizational culture is central to the success of innovation. Organizational culture; the set of shared beliefs and ideals of an organization, can create and supplement innovation as well as hinder it.

Dombrowski *et al.* (2007) describe eight elements of innovative cultures. Through an examination of a range of innovative organizations, the eight elements they describe can be integrated into an organization’s culture to form a framework for innovation.

These elements are summarized by the following diagram (over the page).

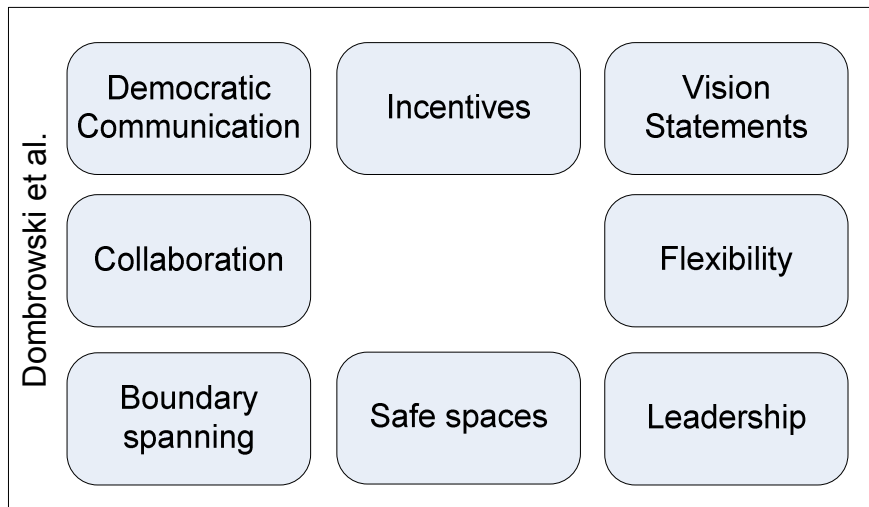


Figure 2 - The eight elements of innovative cultures

These elements; innovative mission and vision statements, democratic and lateral communications, safe spaces, flexibility, boundary spanning, collaboration, incentive schemes and leadership, summarize the areas of organizational culture that need to be present in organizational culture for innovation to occur. Note that these elements are interdependent; if there is a 'missing or weak link' innovation is stifled.

Below we examine each of the elements and their implications in detail.

2.3.1. Incentive schemes

Incentive is a key factor in determining the willingness of organizational members to participate in the process of innovation.

Business process reengineering literature highlights that in organizations the introduction or modification of processes requires new reward structures to encourage conformance and excellence. Zucchi & Edwards (1999) and Keating *et al.* (1999) both highlight the importance of rewarding organizational members based on the new process. As examined earlier, IPR is a particularly important factor in determining incentive because it affects the ability of the individual to claim ownership of ideas and thus rewards.

If reward structures are so important, how can they be encouraged or managed within a tool? The rewards, be they money, gifts, training, recognition or otherwise, are supplied by the organization or individual. However, the tool needs to be able to guide and record these external rewards. An additional factor is the need to promote collaborative behaviour; as identified in previous sections open and closed innovation both rely on collaboration (although to varying degrees) and thus reward structure must provide not only incentive for excellence but for excellence through collaboration.

Practical implementations of reward mechanisms differ. There is the ‘tried-and-true’ method of a financial reward. An interesting dynamic displayed in by *Creativity Pool* is the self reward dynamic, where users specify their own rewards that they would like, which may be fulfilled by the implementer. Although this dynamic relies upon the good will of others, it is still a form of reward.

Another more innovative approach is to apply the principles of game design to create a ‘fun’ experience that users will want to repeat. As identified by von Ahn (2006), ‘unlike computer processors, humans require some incentive to become part of a collective computation’, which is also mirrored by Siorpaes & Hepp (2008). While these studies have focused on the semantic web, the same principles can be applied to other enterprise systems. If the system can create a sense of ‘flow’ in users; the optimal state of engagement (Csikszentmihalyi 1991; 1990), then the system will be highly successful in enabling innovation.

So what sort of features does a software system need to create a sense of fun and flow? Unfortunately this is a poorly researched area. There are a number of angles that we can take to draw inspiration. Games and websites often include appealing aesthetics and simple to use navigation that is attractive to the user. Of particular interest are incentive schemes similar to experience and levelling in massively multiplayer online (MMO) games. *Ideas4All* utilizes a point scheme called ‘Brain-Fu’, although it has no tangible outcome. One could blend the MMO and enterprise system by incorporating a point scheme where roles are granted based on contributions. For example editors could be elected once they have reviewed a certain number of articles and received positive feedback.

However, this approach is untested in a corporate environment. Development of any tool adopting this approach will require the use of an iterative or 'playcentric' (Fullerton, Swain & Hoffman 2008) approach to ensure that the correct user experience is created.

2.3.2. Collaboration

Collaboration refers to the ability and willingness of individuals and organizations to work with others to achieve a common goal. Dombrowski *et al.* (2007) acknowledges open innovation as a central component of an innovation framework. Trust is also considered as being essential to collaboration, although this is not examined in depth.

A different form of collaboration explored in other literature is user innovation. User innovation is a specific form of open innovation where the organization seeks innovation from the end-users of their products. As identified by von Hippel (1988), the 'private-collective' model in product innovation can produce both a greater range of ideas and improve their quality. By looking to the customer and testing ideas against them throughout the innovation process, one can produce better ideas and products. With the introduction of the internet and other communications technologies, the collection of user feedback and ideas becomes easier.

2.3.3. Boundary spanning

Boundary spanning is defined by Dombrowski *et al.* (2007) as promoting and sustaining dialogue across organizational boundaries, both internal and external.

In regards to software tools, the nature of a web system provides an ability to span across geographical borders. This allows fast and effective communication between a range of individuals and organizations.

However, these virtual organizations still experience problems with communication. While these tools allow for faster communication, they lack the immediacy and expressiveness of face-to-face interaction. To overcome these issues, a system needs to create social translucence; a state where the system provides the same depth of interaction as face-to-face interaction (Erickson & Kellogg 2000).

2.3.4. Leadership and vision statements

The elements of leadership and innovative vision statements are intertwined concepts. Strong leadership with clear vision helps to create a culture of innovation. Indeed, vision statements are important for defining the direction of an organization (Nonaka 1991) and are one of the techniques for generating creative ideas (Hudson 2007).

There are also different leadership roles played in the innovation process. Vandenbosch, Saatcioglu & Fay (2006) define five managerial archetypes for innovation. Unfortunately, none of these archetypes has been proven better than the others. However this shows that adaptability of a framework to different roles is important and that these roles of leadership permeate all levels of the organization.

2.3.5. Safe spaces

A 'safe space' refers to an environment where individuals can cultivate ideas in a non-threatening way. Safe spaces allow these groups to explore their ideas and take risks to investigate, develop and implement these ideas. This combines both support from higher management to provide the group with resources, as well as the interactions and activity within the group itself.

From a tool perspective support for the collaboration of these groups is essential. The use of electronic systems has been found to be highly effective in promoting safe spaces as it allows individuals from a range of contexts to develop ideas without criticism and outside distraction (Paulus & Yang 2000; Spencer 2007). Tools also allow for distributed review and development of these ideas.

2.3.6. Democratic and lateral communication

Dombrowski *et al.* (2007) find that communication in innovative organizations is typically characterized by flat organizational structures and democratic communication. This is similar to findings from other research (Nonaka 1991; von Hippel, Thomke & Sonnack 1999) performed on organizational structure; that these innovative firms tend to be dynamic in their operations. This is particularly visible in open innovation networks such as Creation Nets (Hagel & Seely Brown 2006) and Collaborative Open Innovation Networks (Gloor 2006).

2.3.7. Flexibility

Flexibility relates to the ability to promote diversity through job, geographical or other forms of rotation within the organization. This promotes diversity, which is the key to divergent thinking and therefore creativity and innovation.

2.4. Focusing

The greatest realization from this review is that the focus of prior studies and tools has been on the organizational level. Prior studies have provided little insight into the individual, instead focusing on the organization. Only one tool examined in this review was found to be focused on the individual. The majority have a group focus, which is characterized by:

- A distinct focus on one context; all ideas relate to that group or organization. Although many studies do recognize certain perceptions of the individual, the study focuses on the group as a whole.
- A focus on issues and challenges; these tools and frameworks allow organizations to post problems and employees or others to solve them. The goals relate directly to organizational objectives, not necessarily to what an employee or a customer wants.
- IP rules and regulations that favour that organization, rather than the innovator. In most cases, some form of reward is available, but it is questionable whether this is sufficient for the value gained for an idea.
- A focus on process; having a series of stage gates and criteria specific to each organization.

Unfortunately, this focus on organizational innovation has ignored two main factors in the innovation process:

- Individuals are the ones that innovate. It is true that organizational factors and cultural differences affect individuals, but without an understanding of individual motivations and practices how can an organization blindly dictate the flow of innovation?
- Individuals have roles to play outside existing organizations. Entrepreneurship and innovation are roles played within a multitude of contexts; for example work, home, and

study. Individuals are greater than just being workers; they have a range of experiences and interests that are transferable between different contexts.

To explore individual innovation, one can look to a limited set of literature. Coughlan & Johnson (2008) explored 'idea management in creative lives', focusing on the thoughts and actions of the individual. Their findings are that motivated individuals create and capture ideas 'on-the-fly' and can have ideas at any time and any place. This is a chaotic contrast to the structured methods present in many of the existing tools and frameworks examined. Unfortunately, their discussions were focused towards the management of ideas in 'creative' professions such as the arts rather than in the fields of business, engineering and technology.

Other studies introduce some the concerns of innovators but do not delve deeply into them. Dombrowski *et al.* (2007) highlight the importance of trust and adequate reward for innovators participation in innovation programs. These points are also raised by Wood (2003). However neither study examines these points in depth.

In summary, the greatest gap in the literature is the focus on innovation from the perspective of the organization. From the review, there is discussion of culture and of individual creativity, but there is no study that attempts to understand the entire innovation process from the perspective of an individual. Individuals have motivation, drive and passion, as well as fear and greed. Many ideas are lost because individuals *will not* share them, due to incorrect contexts, insufficient incentive and poor mechanisms to support sharing. These factors which affect rationality and behaviour have been unfortunately a 'second thought' in a number of studies, and thus the aim of this thesis is to develop a framework for innovation based around the perspective of the individual.

3. Research Methodology

As we have seen from the literature review the perceptions and practice of the individual in the innovation process have been largely ignored. By uncovering these perceptions and practices we can design a more effective framework that improves innovation.

As outlined by Myers & Avison (2002) the research method employed in a study is based upon the research questions and the underlying philosophical assumptions of the problem area.

Narrowing the focus of the research, there were two research questions to be asked and answered.

The first question was ‘what other existing tools are there outside the literature?’ This question was important because it allowed the researcher to account for other methods and techniques uncovered by the literature that may have reflected different perspectives of the innovation process.

The second question was directly related to the research topic; ‘what are individual innovators practices and perceptions about innovation?’ The answers to this question are the basis of the new framework for innovation.

The researcher designed and implemented a three-stage research method to uncover the answers to the research questions. These stages are summarized by the diagram below.

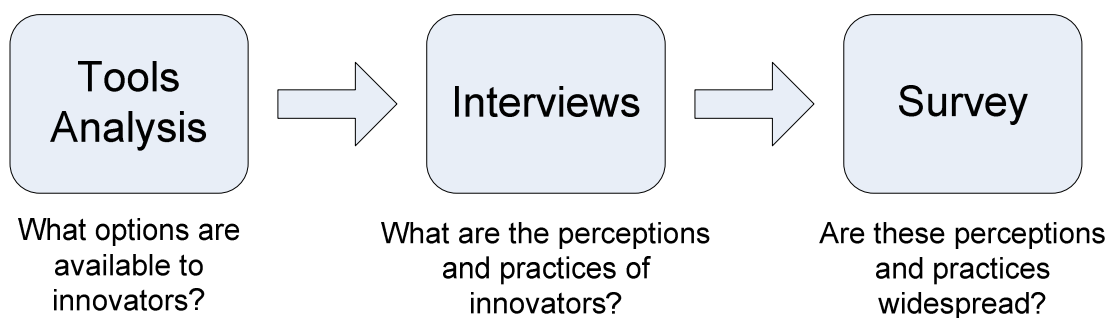


Figure 3 - The research methodology

The first stage was to conduct a survey of existing tools to understand the processes and features that they provide to individuals. The second stage was then to interview a number of innovative

individuals to understand their processes and mindset. The third and final stage was survey a wider range of individuals to provide validation of the findings of the second stage, and thus allow a generalization of any theories formed.

Each of these stages is described in more detail below.

3.1. Stage 1 - Tools analysis

This stage was designed to provide confirmation of the findings of the review. The researcher scoured the web to find and test various ideation and innovation tools. This included reviewing product documentation and media, where possible personally using the tools and then documenting their primary goal and features. The researcher then analysed trends in the tools reviewed and their underlying frameworks.

Given the lack of up-to-date scholarly knowledge as to what these tools are, how they work and what they provide, the researcher chose to adopt a qualitative method of analysis. As stated by Flick (2009), qualitative methods are useful for studying areas that are unknown, are highly complex and thus would benefit from inductive reasoning (rather than conclusive reasoning based on prior assumptions or hypotheses).

3.2. Stage 2 – Interviewing innovators

The researcher then interviewed a number of innovators to answer ‘what do individual innovators do and want in regards to innovation?’

As mentioned by Kvale (1996), interviews are a strong choice for an interpretive research method because they allow the researcher to delve deeply into opinions, outlooks and past experiences of subjects. They also isolate the individual from the group, allowing them to express their thoughts without fear of criticism or repercussions.

These interviews were conducted with innovators who were selected based on their involvement in innovative groups and activities. As with the tools analysis, the lack of scholarly knowledge

forced the researcher to apply qualitative interpretation of the captured data to induce an understanding of the problem space.

3.3. Stage 3 – Surveying innovators

The final stage of the research was to use a quantitative research method to verify the findings of the interviews. As explained by Flick (2009), quantitative methods provide a form of measurement for phenomena and an opportunity to generalize the findings of a theory. While the roots of these methods stem from the natural and physical sciences, they can be adapted to account for social phenomena if the variables and data are encoded in some way (Corbin, Strauss & Strauss 2008).

Structured, anonymous online surveys were chosen as the technique for obtaining the quantitative data required. This allowed the researcher to gain a larger, more representative sample of responses including those from other countries. The anonymity also allows respondents to answer as truthfully as possible.

Given the close connection between the interviews and the survey both of these stages are presented in the same section of this thesis.

3.4. Summary

In summary, the research techniques employed to understand individual innovation practice and perception were centred upon exploratory, interpretive research. In analysing the tools and interviewing users, the researcher attempted to construct an initial view of what tools are available to innovators and how this relates to their practices and perceptions. The subsequent user survey was then performed to obtain and subsequently analyse data that would ‘ground’ the findings of the prior two steps. This would then go on to form the basis of a new innovation framework, and a preliminary design for its implementation as a software tool.

4. Tool analysis

The purpose of the tools analysis was to account for any tools and their associated practices that are uncovered by the literature. The tools analysis is a survey of available tools and services in the market for idea management. This survey provides a fuller ‘picture’ of idea management and innovation practice and thus allows us to improve the way we innovate.

4.1. Defining ‘tools’

To qualify as an idea capture and management tool, the system must have features specific to ideas creation, capture and management and be available on the market as an idea management tool. This includes features such as recording ideas, being able to sort through them and share them. It does not necessarily cover the process of submitting ideas to venture capitalists or managing the implementation project. Note that by tools, we are referring to electronic software packages only.

The list of tools found during the exploration is presented in the Appendices, which includes some of the tools presented earlier in the literature review. There are 56 tools that were reviewed. While there are other tools on the market, the tools reviewed span a wide range of focuses and operating models, and is thus considered to be representative of the entire market.

Alternative tools that could be used for idea management (and in some cases had been used) were also explored. ‘Alternatives’ is defined as tools that do not meet the above definition that may be used to support innovation with some form of customization or other work. 18 of these alternative tools were examined and categorised. These are presented in a separate section in the Appendices.

4.2. Analysis

The researcher examined each tool by reviewing its primary purpose and list of features. Where possible, the researcher used the tool. In cases where this was not possible, the researcher reviewed product documentation and media, including product tours and screenshots. This hands-on approach allowed the researcher to develop an understanding of what a tool does, how it works and how it is related to other tools.

4.2.1. Common factors

Overall, it seems that these factors are common to the majority of tools examined.

Web

The first trend is the dominance of the web platform. As mentioned earlier in the literature review the web platform is the 'perfect' choice for a platform because of its centrality, communication with external services and well understood and practiced architecture. It also supports a range of operating systems and technology platforms.

Organizational focus

Most of the tools examined target a particular organization. An organizational focus generally means that intellectual property rights, the problem focus and simplified communicative/social tools are common. Most focus on responses to challenges.

Software-as-a-Service (SAAS)

Most solutions are delivered through software-as-a-service; a software deployment strategy where the software vendor provides a managed instance of the software to the consumer.

Commercial

The majority of tools are commercial. Even those that are not commercial tools are delivered as SAAS. The lack of an openly available platform is a significant gap in this market and highlights the need for an openly available innovation tool.

These commonalities are much the same as those presented in the literature review. These findings provide the confidence and data to define a typology of existing tools, and thus accurately summarize the various tools and frameworks currently in the market.

4.2.2. Categorisation

This section details a typology of the tools created based on their operational model. There are 5 categories defined in the typology. Each category is described in detail below. Three of these categories are borrowed from another summary of crowd sourcing (*List of Open Innovation &*

Crowdsourcing Examples). Note that while all these tools have been put into one category it is arguable that some of these tools fall into a number of other categories as well.

Commercial organizational tools

These tools are those that are targeted towards a large commercial organization. They contain many features, but particularly emphasise reporting, payoffs and capturing organization-related information, such as how an idea can provide benefit to the company. These are delivered both as SAAS and as web server application offerings and often include consulting fees for setup, customization and support.

Such tools offer comprehensive frameworks that track an idea from conception of an idea through to implementation. For example, *Idea Central* contains modules for idea creation, capture, collaboration, formal review and reporting activities. It structures the innovation process in a manner similar to the process presented by Cormican & O'Sullivan (Cormican & O'Sullivan 2003). Similarly IBM's own internal tool, *Thinkplace*, structures the innovation process into 4 main steps that focus on the interests of IBM. In the case of *Thinkplace*, all intellectual property developed is owned by IBM. Note that both these tools are designed to be used internally by the organization.

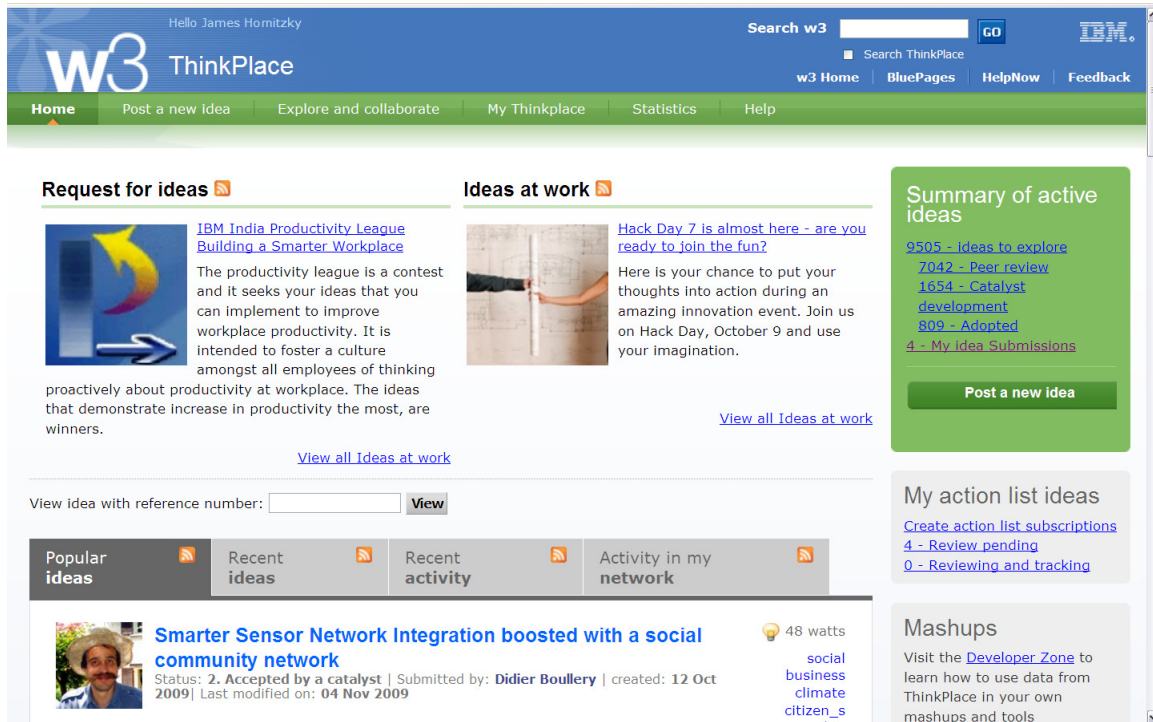


Figure 4 - Screenshot of Thinkplace

Thinkplace is an example of an internal tool used for idea management. It operates as an open ideas box for employs, and to a lesser extent as a challenge mechanism.

The dynamic of a commercial tool is based on organizational benefit. These tools often rely upon the perception of 'it's my job' to motivate individual participation in these communities, although as the community evolves this may change. Provisioning of rewards was not mentioned in the case studies (Gamlin, Yourd & Patrick 2007; Lamont 2004) presented in the literature review.

Commercial innovation intermediaries

These tools and the organizations that run them are a specific type of intermediary that acts as a broker between those with problems (commercial organizations) and solvers (innovators). It is a place for individual innovators to solve the issues of companies. Typically, the challenge is run as a competition, with a reward being posted for the innovator (or innovators) who 'solves' the problem. As with commercial tools, the individual trades their intellectual property for a reward².

² Preliminary work by Sylvan Rudduck provides a more detailed picture of the behaviour of individuals in such groups

The dynamics of these commercial innovation intermediaries are simple. For the majority, they promote challenge-based innovation, which is essentially a short-term strategy of outsourcing organizational innovation. Some run longer campaigns with stages such as the BMW Motorrad project listed on *Atizo*, however for the majority of cases the general process is simplistic; essentially being a large online brainstorm (or rather competition) with rewards for the ‘best’ idea.

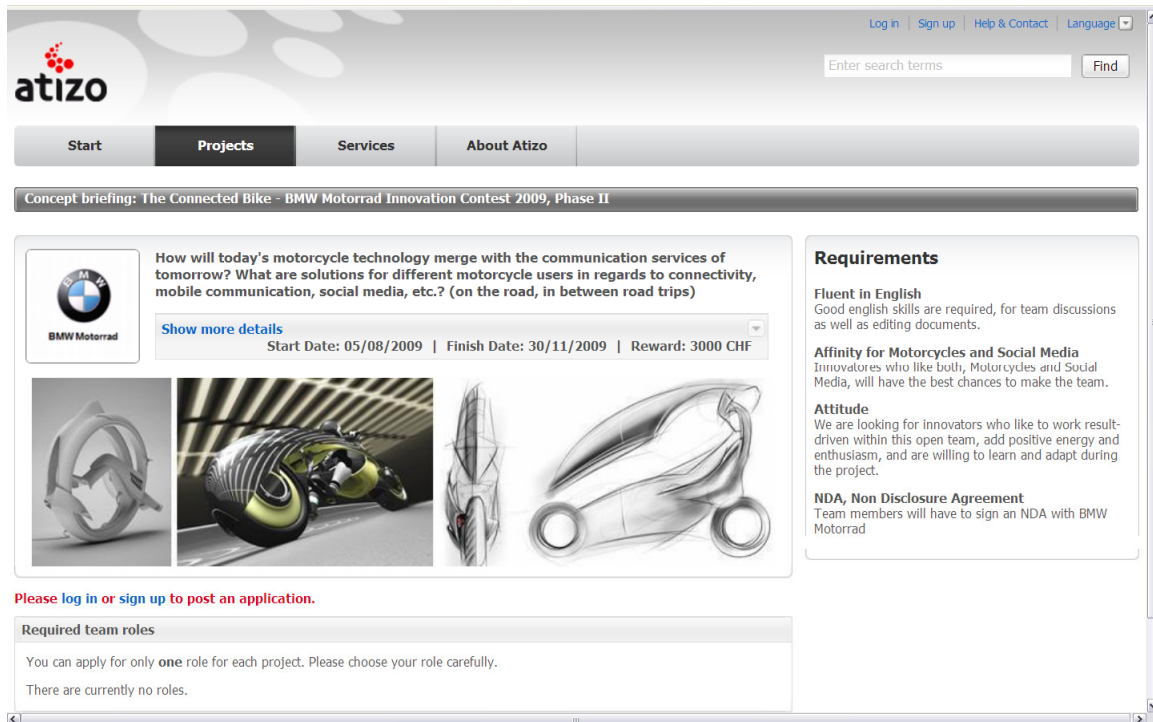


Figure 5 - A screenshot of the BMW Motorrad project brokered by Atizo

On the 6th of November 2009, this project is in its second phase. It demonstrates how long-term open innovation groups, in this case over a period of years, can be formed through commercial innovation intermediaries.

Of particular interest in these commercial intermediaries is the ‘trade-off’ that innovators are willing to accept; in return for the contribution of their intellectual property they receive a financial reward. In the majority of the intermediaries, a relatively small financial sum (much less than hiring an R&D team or consultants) buys a range of ideas. The other point of note with this category is that running a competition removes any incentive for collaborating and improving each others ideas, which could result in lower quality ideas.

User innovation and crowd-sourcing

A number of modern companies have tools for creating and sustaining user innovation. These tools are implemented similarly to the commercial innovation intermediaries, except that instead of targeting innovators in general they target users of a product or service. As such, these tools have a dual nature of being both challenge-based and ad-hoc innovation tools.

For example, there was Smith's 'Do us a Flavour' competition that was run to drive the creation of the concept for a new flavour of chips (and gain valuable market exposure). This was an instance of an ideas 'challenge'. However there are also a number of open-ended, 'suggestion box' type tools, such as Dell's *IdeaStorm*. There are also a small number of 'user innovation intermediaries', such as *GetSatisfaction*, which implement both suggestion box and challenge dynamics for many organizations.

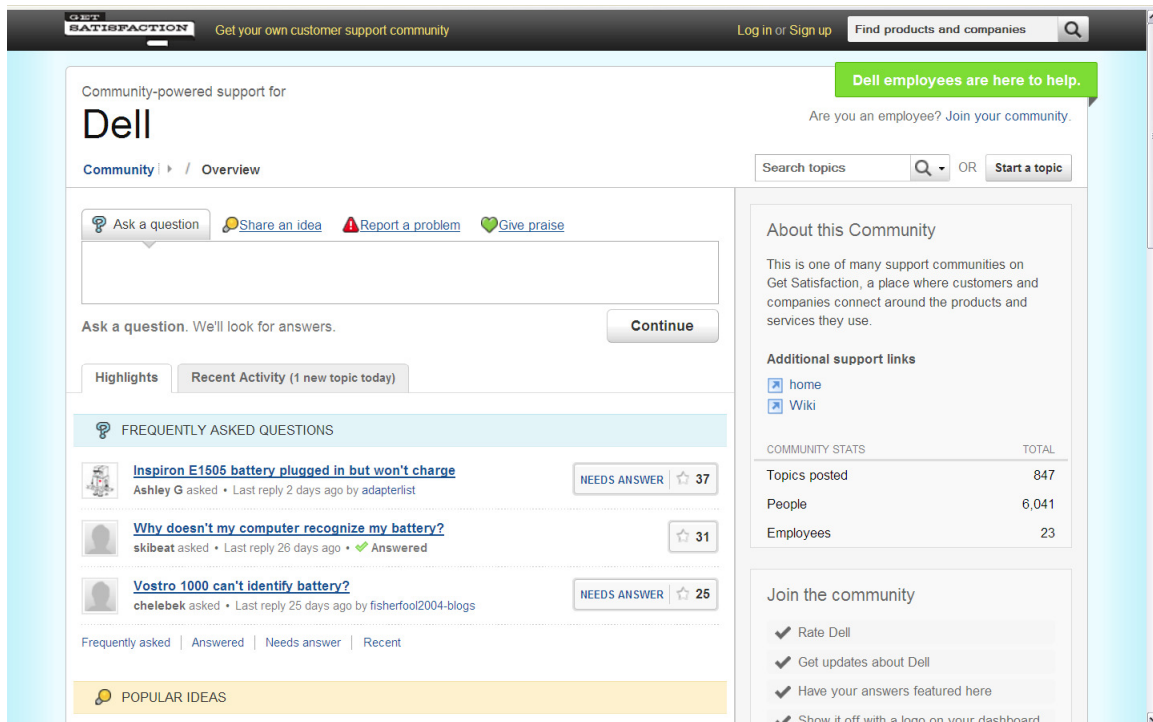


Figure 6 - A screenshot of the user innovation community GetSatisfaction

GetSatisfaction is one of the few communities that act as an idea box and as a challenge mechanism for organizations. It spans multiple organizations, which is a rarity in user innovation environments.

With these initiatives, the incentive for the individual is less clear. For challenge-based user innovation there is generally an explicit reward. However, in a public suggestion-box model the motive shifts from financial reward to (one would suppose) personal satisfaction.

Open innovation intermediaries

An open innovation intermediary is the opposite of a commercial innovation intermediary. These are tools with supporting communities where individuals put forth their ideas in the hope of having them implemented, either by themselves or by others. While they broker the innovation process, they harness ideas for individuals and small groups as opposed to large organizations. Often they are basic in their implementation and are used in a manner akin to a message board.

Generally these tools are structured around a purpose of contributing to the ‘greater good’; with many having only basic forms of idea protection. The motivation for participating in these communities is a stark contrast to that in commercial intermediaries.

Individual tools

This is an important category even though there are only a few tools that fall into this it. *Wridea* is an example of an individual idea management tool for one’s ideas. As an example of a mobile tool, *Sparks* is an iPhone application that acts as both a task manager and ideas tool. *Wridea* offers a number of useful features to innovators; however it has a small user base and no integration with outside communities. *Sparks* is simplistic in its operation and offers the same functionality as the default ‘notes’ application in regards to ideas.

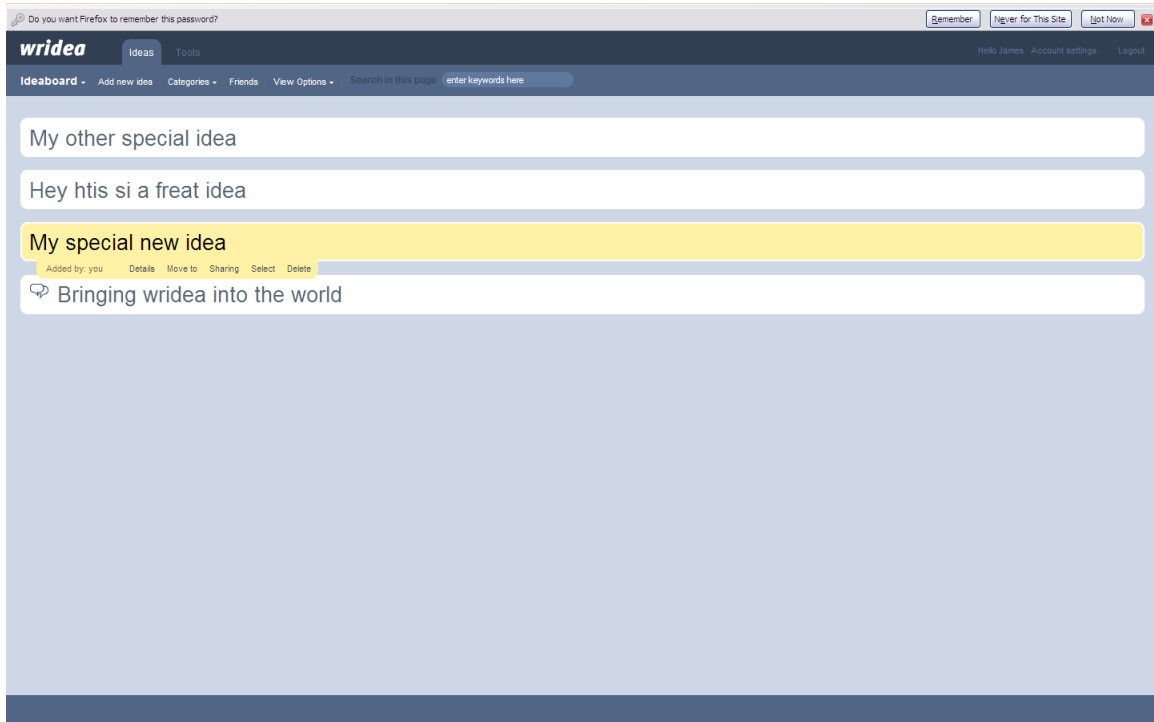


Figure 7 - Screenshot of Wridea, one of the few individual-focused idea management tools

This tool presents the interface of a simple ideas list. While it has a small user base, it has a number of exposed APIs that could make it a useful idea repository.

These applications impose little to no structure on innovators, and instead allow them to manage their own process as they see fit. While advantageous in that it mimics the thinking style of an innovator, it also lacks the structure which improves and progresses innovative ideas.

4.3. Looking at alternatives

Individuals and organizations can also utilize other tools and services outside those marketed as idea management solutions. To qualify as an alternative tool it must provide the features of idea capture, sharing and management, although it may require some form of customization and or manual process to replicate certain features. Note that these alternatives reviewed are all (except for *Google Wave*) openly available, being either free services or open source tools that innovators can use (and in some cases have used). These tools have been grouped into categories that are described below.

Word processors and spreadsheets

A 'bare bones' approach (similar to using a notepad and pen), these tools offer basic features for idea capture; representing ideas through text and images. Sharing is often at a later stage via email or another communications technology.

However, there is no innate ability to for categorization, large-scale idea management or sharing.

Social Networking

Social networks are tools and communities that are spaces for social interaction. While this is a broad category, a number of these tools offer compelling features that can be used to collaborate and share ideas. *Facebook*, *Twitter* and *Friendfeed* are examples of social networking tools that have already been used by a number of innovators to share their ideas. In particular *Facebook* plays host to the IDEAS group, a social group that discusses ideas and innovation in a range of different fields. The IDEAS group currently has over 450 members throughout the globe.



Figure 8 - The IDEAS group on Facebook

The ideas group is a community of idea creators and innovators that simply discuss ideas and host large scale brainstorming events. This group shows the potential and usefulness of social networking tools in ideation and innovation.

However, with these social networking tools the ability to manage ideas is not well catered for and the control of intellectual property can become a major issue.

Forums

Forums are another alternative that provides a feature set for sharing and collaboration. Forums are used for some of the open innovation communities, including *Creativity Pool* and *SharingIdeas*. Forums are particularly good for discussing and developing a particular idea.



Figure 9 - A screenshot of the Creativity Pool tool/community

Creativity Pool is one of the founding open innovation communities that still have a number of active members and ideas. It demonstrates how a forum can be used as an idea management tool. It is also one of the few open innovation communities.

However, as with the social network, privacy and intellectual property is not supported by the tool itself.

Wikis

Wikis are similar tools to forums. Wikis however have a better capacity to capture evolving information or knowledge. A preliminary, proof-of-concept version of the *Innovatia* tool that predates this study was implemented as a customized wiki. From the interviews, IDEA4 mentioned using a wiki as their private idea capture and enhancement tool.

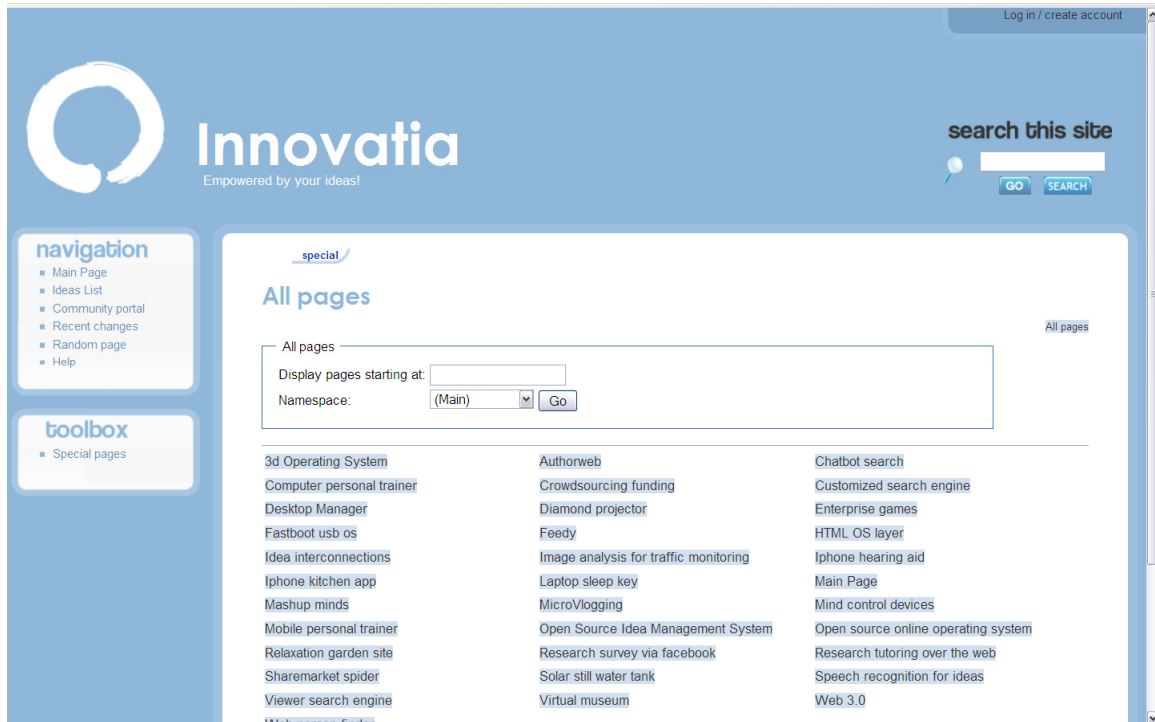


Figure 10 - The original Innovatia tool that predates this study

This tool is built on top of the popular Mediawiki software, the same system that is used for Wikipedia.

However, like forums, wikis suffer from lack of safeguards to retain intellectual property, and have primitive forms of privacy control.

Mind mapping

Mind mapping software allows users to list ideas and visually represent their relations and connections to each other. *Mindmeister* and *FreeMind* are examples of mind-mapping tools. Note that while it can be advantageous to present ideas in this way, it can be a difficult way to sort and manage ideas.

However, mind maps represent visually the thoughts of a person (or a small group), which can be difficult to share and convey to others. These tools also lack an inherent form of sharing or protection of ideas.

Information aggregation markets (IAMs)

An information aggregation market is a form of collective intelligence tool that uses people to aggregate information. They are based around a polling dynamic, where there is a question or statement, and people respond or rate this statement. More complex forms of these markets, such as the *IDeM* market presented in Bothos, Apostolous and Mentzas (2009), utilize a complex points or shares system. In these complex systems users assign a limited amount of points to the various ideas and statements. Collectively the points show the potential success of a particular idea or likeliness of an event, as well as being able to contrast the value of an idea against others.

Note that these are very much prone to the groupthink of the community. These mechanisms are useful for judging the success of an idea, but have poor support for the creation and development of the idea.

Email and discussion groups

Email and discussion groups are basic form of sending electronic messages between parties. Email and discussion groups are useful for sharing and developing ideas.

The main issue with email and discussion groups is the clutter of information and disorganization in sharing. Similar to forums, email and discussion groups present information in a way that it becomes difficult to find the current state of an idea and its evolution without understanding the entire email conversation.

Wave

Google Wave is a new tool that combines many of the features of emails, wikis, social networking and other collaborative tools. Although it is new and has not been exposed to the public, its feature sets seem to offer a rich form of collaboration and interaction. This could be a viable platform to build upon and should be investigated further as it develops.

4.4. Making sense of the typologies

The innovation tools typology created represents a spectrum of tools that range from structured to unstructured. In addition, individuals and organizations can choose to implement other ‘alternative’ tools for idea sharing and management purposes.

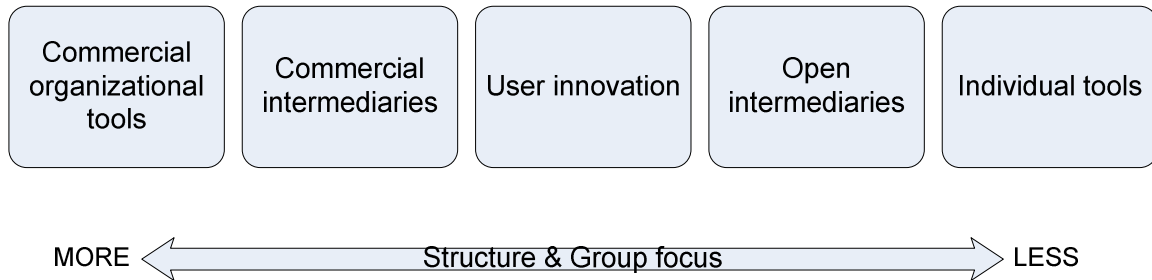


Figure 11 - A typology of structured innovation tools

Based on the typology, as one moves from commercial organizational tools to individual tools, they become less structured and more individually focused. They also decrease in number; the majority of the tools and services target commercial organizations.

However, creation of the typologies in itself is not very useful. How does a set of categories relate to our overall goal of understanding what drives individual innovation and how we can support it?

By creating these typologies, we have highlighted a number of important points:

- There is a low focus on the individual within the industry. This mirrors the lack of individual focus that was displayed in the literature review. The majority of the tools examined, including alternatives, focus heavily on contributing to a whole or an organization rather than providing the individual with a comprehensive innovation toolset.
- There are a number of open innovation communities that thrive upon an operational model that is different to those of commercial entities. The primary motivators of individuals in each model (i.e. money vs. idealism) are in opposition.
- There are a range of features and techniques that can be implemented in the new *Innovatia* tool.
- The greatest ‘lesson’ of all is the overriding importance of framework. As seen with these tools and in the case studies presented in the literature review, a number of tools have

achieved successful outcomes. While each tool has its own model, the end goal is the same; to innovate.

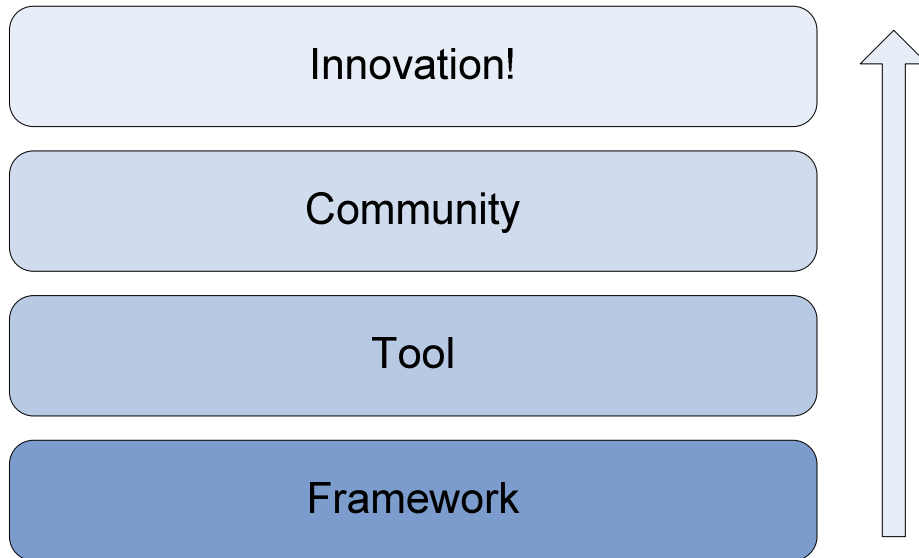


Figure 12 - Framework is fundamental to innovation

Innovation is built upon the bedrock of community, tool and framework. The framework is the absolute base of innovation; it provides the core values and concepts that create innovation. Tools are processes, methods or practices that implement the framework. Correct combination of these will build a community, which will lead to sustained innovation.

As an aside, it would be worth revisiting these tools on a regular basis for the next few years to see how they grow and how the market evolves. According to a Gartner report (*Gartner's 2009 Hype Cycle Special Report Evaluates Maturity of 1,650 Technologies*), the idea management market is still young and has yet to show its full potential.

5. Interviewing and surveying innovators

The goal of the interviews and surveys was to discover what individual innovators thought about their own innovative processes. This is the basis for the innovation framework proposed by this thesis.

The researcher asked all respondents to consider themselves as entrepreneurial innovators. By entrepreneurial innovators, we are referring to a type of person that creates novel ideas and pushes to implement them. An example of an entrepreneurial innovation includes a new invention, ideas for research projects, new software, new products or services.

The researcher designed the initial questions and focus areas for the interviews around the innovation process presented in the literature review. While the ‘process’ nature of innovation is largely invisible to innovators, they still execute an emergent innovation process with predefined activities.

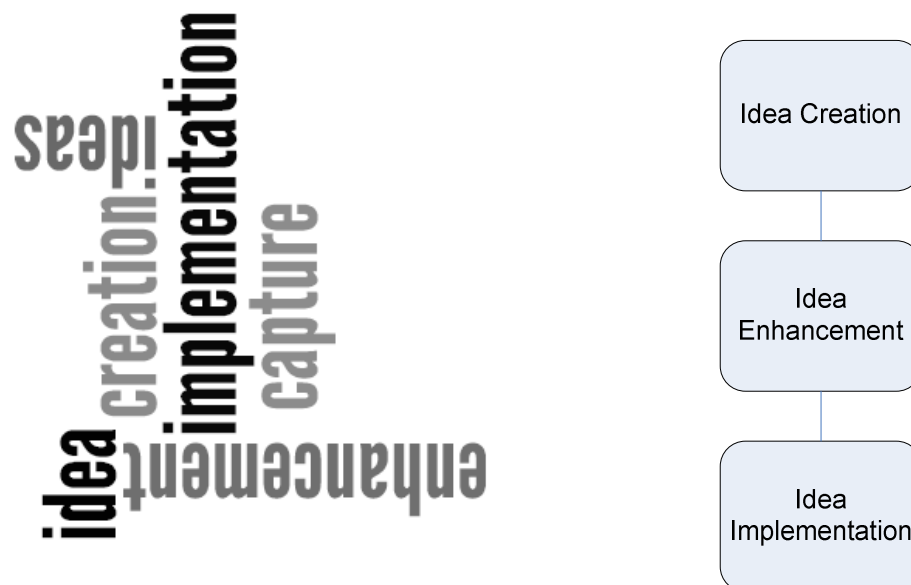


Figure 13 - The individual and organizational perceptions of innovation

A visual comparison between the individual (left) and organizational (right) perceptions of innovation. Typically individuals employ a lateral approach to innovation, whereas the enterprise employs a linear approach.

5.1. Target audience

The target audience for the survey was entrepreneurial innovators. However, this is a broad categorization, and given the scale of the project the scope was narrowed to a smaller target audience.

The interviews needed to be delivered to a specific set of people known to be innovative. Therefore the researcher selected individuals that were known to be involved in some form of innovative activity. These innovators showed various forms of entrepreneurial commitment and had different ideas. However they all had a defining characteristic of being proactive in their idea generation and development.

The survey was designed to confirm the findings of the initial interviews by examining a larger sample. A number of entrepreneurial societies and organizations were sent invitations to the survey. The survey was also delivered to university staff and students. University students and staff are perfect examples of entrepreneurial innovators; research is a daily pursuit of innovation. To target these individuals, the survey was distributed via the university faculty's intranet site.

5.2. Data collection

Interviews conducted were based on the focus areas of the innovation process (creation, capture, sharing, enhancement, reassessment, implementation and features). Interviews consisted of 30-minute face-to-face meetings between the researcher and an interviewee. A total of 8 subjects were interviewed. All interviews bar one (at the interviewee's request) were audio recorded. The interview sheet is provided in the Appendices.

The surveys were then conducted online using the LimeSurvey tool (*LimeSurvey.org*). As mentioned earlier, survey invitations were sent to a number of entrepreneurial groups as well as staff members of the faculty and students. 47 responses were received over a period of 8 weeks. However, of these 47 responses 8 were incomplete. These had on average over 50% of data missing from a response, and thus these were ignored when analysing the results. Therefore there were 39 full responses that were analysed.

5.3. Summary of the interviews

Each of the interviewees was given an alias using the pattern IDEAX, where X is simply an identifying number. IDEA1 was a full time student championing innovation through a start up entrepreneurial society/company. IDEA2 was a full time student with part time work, who had successfully started a small online investment business. IDEA3 was a full time student attempting to start up small mobile applications company. IDEA4 was a full time student with part time work with a number of entrepreneurial ideas, with prototypes implemented for a number of them. IDEA5 was a full-time IT worker who is participating in an entrepreneurial association. IDEA6 was a full time worker who is involved with administrating a gaming magazine and community. IDEA7 was a full time student with entrepreneurial aspirations, who had implemented a number of prototype systems. IDEA8 was a full time worker who had developed a small online IT community. All interviewees had an information technology and business background. IDEA1, IDEA2, IDEA3, IDEA5 and IDEA8 were all members of a separate entrepreneurial company.

In general, the interviewees showed an ad-hoc approach to innovation, lacking both structured process and thinking techniques. Of the process of creation and enhancement, only one innovator (IDEA4) applied any form of creativity technique. In reference to idea management, most continued with ideas in an ad-hoc fashion with no set milestones. Time management subsequently was deemed an issue by a number of interviewees (IDEA3, IDEA4 and IDEA8). The majority of interviewees (IDEA1, IDEA3, IDEA4, IDEA6, IDEA7 and IDEA8) answered that they revisited their ideas from time-to-time; however there was no set interval or mention of structured assessment.

In terms of idea creation processes, the majority of the innovators interviewed generated ideas on an ad-hoc basis. All interviewees indicated that there was no one location or time where ideas occurred to them³. Some interviewees advised that ideas were formed through discussion and brainstorming sessions with friends (in particular IDEA2). However, all respondents noted that they generated ideas by themselves, and that these often occurred over a period of time. Some interviewees indicated setting aside individual ‘thinking time’ (IDEA3, IDEA4) to create or improve ideas, although in these circumstances there was still little control over what generated.

³ Amusingly summarised by the term ‘brain farts’ from IDEA8

In terms of idea capture, the majority of innovators utilized some form of textual representation as the primary method of capture. Most respondents use rudimentary capture devices; the majority have a list-style capture devices (notebooks, word processors, spreadsheets) for writing quick notes about an idea. In a small number of cases interviewees utilized more complex tools. IDEA4 utilized his own private wiki with a number of sorting and combinational tools. IDEA1 used *Facebook* to post article links that had been interesting and that had triggered ideas, allowing him to also share their thoughts and interests with others.

A number of innovators did not explicitly capture all ideas. In the case of IDEA1, he would only formally capture ideas that he thought had potential. Note that the idea was developed and thought about for a period of time before being captured, and that the primary reason for capture was articulation to others. A number of other innovators (IDEA2, IDEA5 and IDEA8) responded similarly.

Idea sharing, which is at the core of innovation, was generally between interviewees and those they regarded as close to them. Interviewees answered that they shared their ideas with others who they both trust and who can offer useful insight, both from a technical and an end-user perspective. Thus friends and colleagues were the most emergent category for all interviewees.

The primary motivator for sharing ideas was to gain feedback about the idea and develop it conceptually. It is interesting to note that the idea sharing was in most cases not about implementing the ideas together, even though idea implementation was regarded highly.

When asked what prohibited sharing most, there were a few responses. For many, the defining factor was trust. There were a number of reasons for this; having credit taken away, the potential loss of financial reward as well as criticism.

Interestingly, a point mentioned by a small number of innovators was their inability to successfully convince others to work with them. As mentioned by IDEA1:

“When you do tell your friends about your ideas they are not as receptive as you would like them to be...”

A major component of sharing is not only for feedback but help in further development and implementation, and that a difficult part of innovation is having others 'buy in' to an idea. It was interesting to note that helping others with ideas was largely omitted from the other interviews, only being mentioned when they had formed the ideas with others (IDEA2) rather than being approached at a later time.

When the innovators were asked if they would share ideas they considered of lesser potential, a number answered that they would. However, all indicated that they still would like to receive a form of reward (most commonly recognition) for a particular idea.

Unsurprisingly, none of the innovators mentioned involvement in an open innovation community.

Implementation of ideas varied across the innovators. Many of the innovators had implemented small scale innovations such as small online businesses and proof-of-concept prototypes. However, none had experienced large-scale success. As such, the implementation of ideas was highly valued.

Finally, upon deeper examination of conversations with the interviewees, a trend emerged in the underlying motivation for innovation. While many had mentioned the importance of financial reward, it is a motivation to achieve a personal goal or interest that is arguably the primary driver of innovation. This is aptly summarized by a statement from IDEA1:

"I like to do things because I can"

This sentiment is echoed throughout a number of other interviews; IDEA6 with their involvement in the gaming community, IDEA4 with his 'change the world' perspective, and more from the other interviewees.

In summary of the results, it appeared that innovators could generate ideas effectively, but had little support for idea improvement or sharing. In addition, their outlook towards ideas as being meaningful goals and as valued possessions leads to protective behaviour, prohibiting them from sharing outside their immediate contexts. However, as we have seen from the lessons of open innovation, this protective behaviour limits innovators ability to develop and implement their ideas.

5.4. Summary of the survey

The survey questions were developed based on the trends identified from the interview stage. The survey questions are presented in the Appendices.

Demographics of the survey varied in similar proportions to the review. 58.97% of respondents were engaged in fulltime work, with 82.05% of respondents engaged in some form of work. 38.46% of respondents were engaged in full time study, with 66.66% overall engaged in some form of study. In addition, of these 39 respondents, 19 respondents (48.72%) both worked and studied. The majority of respondents regarded themselves as having expertise in IT (79.49%), and a smaller degree as having expertise in business (28.21%). Note that those respondents who were experts in other areas responded similarly to the respondents with IT expertise.

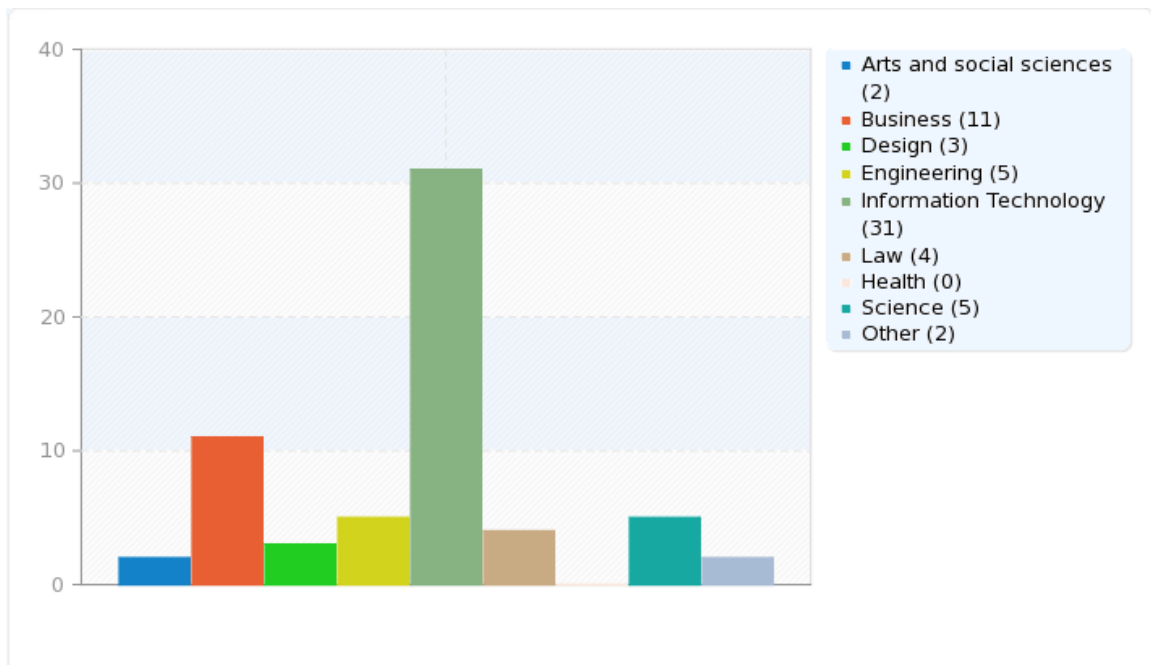


Figure 14 - Graph of the expertise of respondents

While expertise was concentrated on IT, results indicate that other innovators hold the perceptions and practices as IT respondents. Note that the respondents varied between work and study, with many crossing both areas.

In terms of idea creation, respondents indicated higher levels of focus in their approach than in the previous interviews. 76.92% reported the majority of their ideas being based around a

problem or focus. This was also represented when questioning of how many ideas relate to their profession; 74.36% answered as having 50% or more of ideas related to their profession.

However, as seen before the exact time and place of idea creation is unknown. The location of idea generation was distributed in an almost uniform pattern, with surprisingly the most number of ideas being generated in the home. Similar to the interviews the majority of ideas are formed through individual thought (61.54%), although this is not a huge margin over group idea generation. These statistics seem to support the need for individual thought or ‘thinking time’ as suggested by a number of the interviewees. This also suggests a period of longitudinal thought, which was also presented by Coughlan & Johnson (2009).

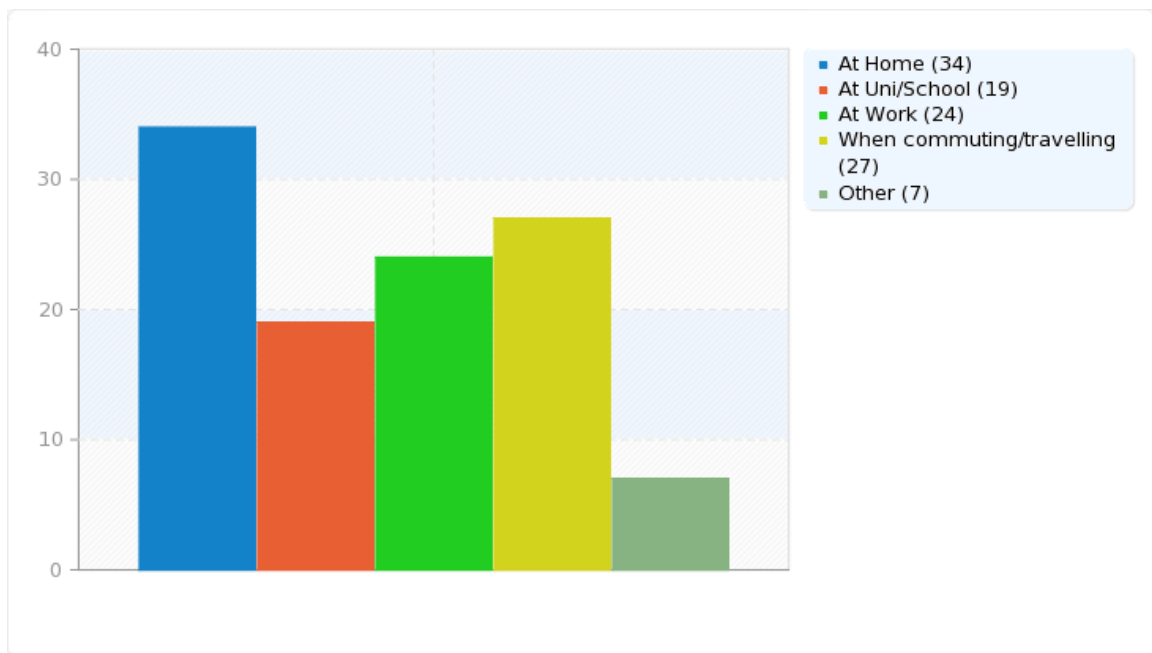


Figure 15 - Graph showing the distribution of location in idea generation

This graph summarizes the ad-hoc approach and event of idea creation. While respondents had indicated in the survey that a problem or focus generally triggers an idea, that path to its creation is undefined and as such ideas ‘happen’ anywhere. Many respondents answered across multiple contexts. Interestingly, the highest number of respondents chose the home as the greatest destination of idea generation. This suggests longitudinal thought patterns and the need for relaxed ‘thinking time’.

As found in the interviews, the areas of idea creation, capture and management did not have the application of systematic thinking techniques. 79.49% did not employ creative thinking methods,

76.92% had no structured methods of improving an idea. This is an area that needs to be improved.

In regards to idea capture, innovators responded similarly to the interviewees. Only 35.9% of respondents attempt to capture an idea immediately, while 56.41% 'just think about it'. This shows an undisciplined approach that allows a number of ideas to be lost. The overwhelming majority of respondents prefer writing as the form of capture (76.92%) with a number of respondents also drawing (38.46%). As such the most common tools for capture are word processors and spreadsheets (51.28%), as well as paper 'ideas books' (46.15%). Note that many respondents indicated that they used both. Only 7 respondents indicated using another collaborative tool and only 1 respondent indicated that they used a specialized ideas management tool. 23.07% of respondents used no form of external capture in their innovation process; exclusively using their mind.

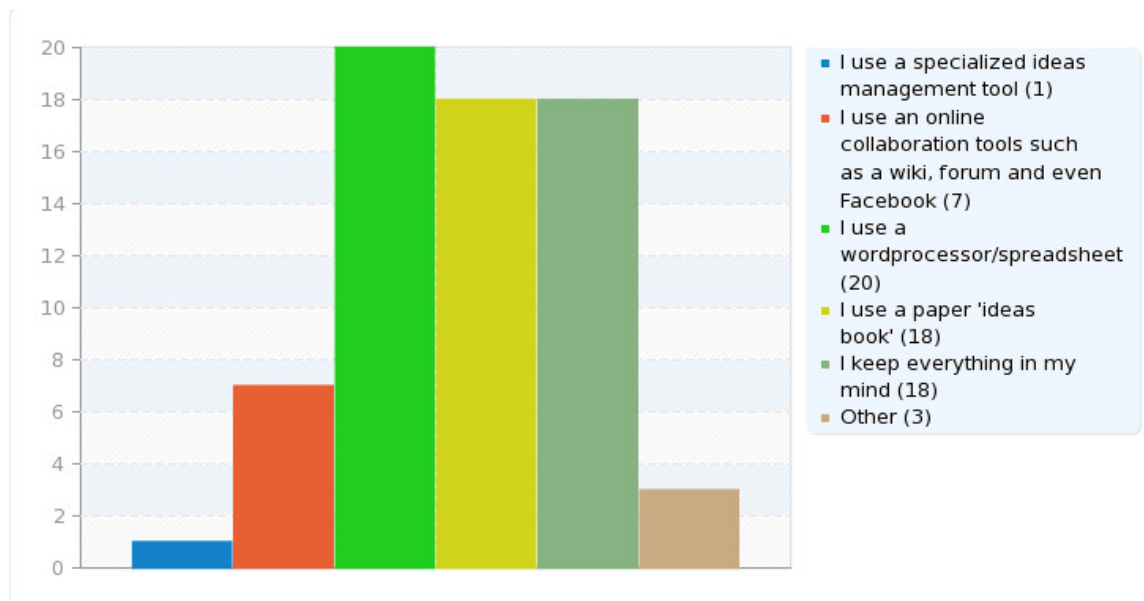


Figure 16 - A graph showing the tools used by innovators

It illustrates the heavy reliance upon simple list based form of idea capture. Note the popular use of the pen and paper, which was almost always used in concert with a word processor. Note that 9 respondents answered as using no tool for idea capture.

Idea sharing is a complex area of innovation that received a range of responses. 66.67% answered in the affirmative to more often sharing their ideas when not. Again the group that innovators are

most likely to share with was friends (41.03%) as well as fellow students or colleagues (35.90%). As in the interviews the main purpose of this sharing was to develop an idea conceptually (76.92%). This was preferred to be done by talking (69.23%) or via a face-to-face meeting (25.64%).

The concept of reward for sharing was also explored in the survey. Innovators answered that that being able to implement the idea was the best reward personally (43.59%), followed closely by being recognised and respected (28.21%). Surprisingly, financial reward was ranked as the lowest motivator for idea sharing (12.82%), following the satisfaction of giving (15.38%).

This was mirrored in the factors that most hinder idea sharing. The fear of being criticized harshly was rated highly (35.90%) followed closely by the potential loss of recognition (30.77%). The potential loss of financial related at 17.98%, with other factors accounting for 15.38% of responses.

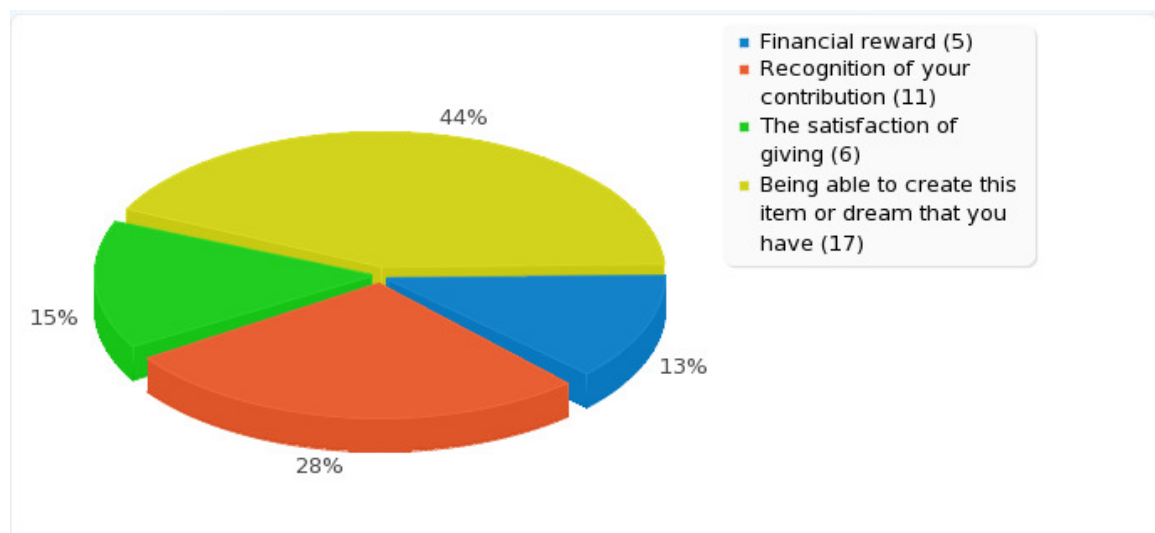


Figure 17 - Pie chart showing the best reward for sharing ideas

These results indicate that idea sharing is considered an activity that leads to the implementation of ideas, and is in many ways self-fulfilling. The two extremes of selfishness (money) and selflessness (sharing) are ignored, instead it is a quest to implement the idea according to the vision of the innovator that is most important. Note that the recognition of contribution is also highly important.

51.28% of respondents had indicated having one of their own ideas used without their consent in the past. Surprisingly, these same respondents who had ideas 'stolen' in the past were more open to sharing ideas (75%) than those who have not (57%). Of the 61.54% of respondents that indicated having implemented an innovative idea successfully, 75% were more generally willing to share their ideas.

In terms of barriers to implementation, not having enough time was ranked highly overall. 46.15% chose this issue as their highest concern. Similarly high was the lack of support (35.9% as second preference).

Overall, the majority of innovators are slightly dissatisfied with their methods of ideation and innovation. The mean of the satisfaction rating (on a scale of 1 being unsatisfied to 5 of being satisfied) was 2.82. This shows that innovators do recognise 'room for improvement' in their practices.

5.5. *The flaws of the individual innovator*

From our results, it appears that the individual innovator is far from perfect. The innovator is an individual that pursues their ideas with self-centred intent. While this does not necessarily imply financial reward, there is a need for self-fulfilment and in many cases recognition from others. This was apparent when examining the motives behind idea sharing and the concept of reward in idea sharing.

While being self-centred is rational from an innovator's perspective, it creates a number of issues. A self-centred intent leads to a conception of ideas as property, which is reinforced by intellectual property law. This conception leads to innovators attempting to exert control over their idea, and thus sharing only with those closest to them that they trust. This was exhibited in some of the comments from the interviews and the dominance of idea sharing between innovators, friends and colleagues in the survey. While arguably their friends and colleagues share the required expertise, they also belong to the same context and thus provide only a narrow perspective, a limited amount of support. This adherence to the immediate context has the same issues as 'closed innovation' that was examined in the literature review.

A number of other issues raised could also be solved by more open sharing. Time, a primary concern, could obviously be lessened through sharing the 'load'. Expertise, while not a highly rated issue, can be obtained through looking for outside projects. In addition, being self-centred gives rise to the 'not invented here' mindset. This means that innovators are less likely to work with others on another idea creator's idea, as there is no personal vision to be realised. Idea support was a key concern raised by a number of innovators in the interviews, and this evidence of self-fulfilling behaviour highlights this issue.

Finally, innovators are undisciplined. It is not 'fair to say' that these innovators are lazy; many in the survey both worked and studied. However, they were not diligent with recording ideas, nor sharing them or attempting to develop them, and often responded as having no time to implement them. This highlights the need for some basic structure that can provide support in capturing, improving and managing ideas.

These flaws illustrate a need for a shift in individual innovation practice towards openness. The greatest failure that we have seen in innovative individuals is their inability (or rather unwillingness) to collaborate on a large scale. This *needs* to be addressed. A number of companies known for their success, such as 3M (von Hippel, Thomke & Sonnack 1999), employ open creative teams who actively share and collaborate with innovators within and outside of the company. Similarly, successful open source projects such as *Linux* show the viability of community-led open innovation (Hagel & Seely Brown 2006). Support structures and techniques *must* be provided to the individuals to allow them to build these teams and communities and thereby innovate.

6. A new framework for individual innovation

The new innovation framework proposed in this section focuses on having individuals excel in innovation and thereby propagate this success through organizations and society. Unlike prior research and tools, this framework accounts for the needs and the failings of an innovator. This framework is intended to be a high-level abstract framework that can be integrated into a multitude of contexts.

6.1. The framework

The majority of the focus areas in the framework are targeted at supporting communication and openness; that is sharing ideas not only within an individual's immediate context, but outside it in a number of different communities. The framework retains the common individualistic perspective of idea ownership, and instead focuses on supporting sharing and creating win-win situations for all parties. Note that this is a paradigm shift in perspective; it is not about changing the culture or mindsets of the innovators, it is about supporting them so that they will innovate organically.

The elements of the framework are summarised in the following diagram.

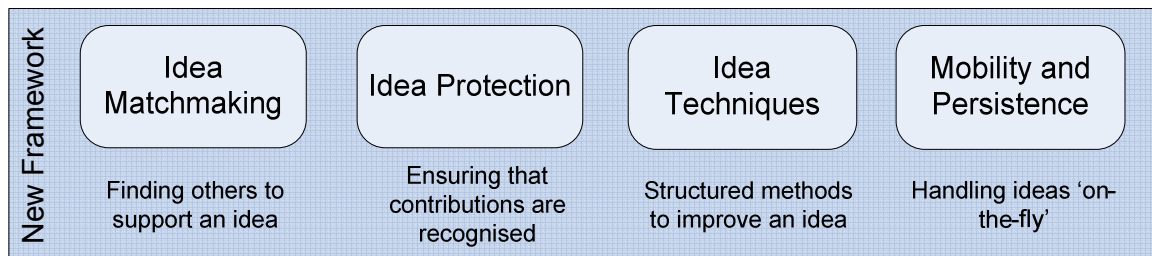


Figure 18 - The 4 elements of the new framework

Each is explained in more detail below.

Idea matchmaking

Idea matchmaking refers to the ability to find others who are likely to partake in the development in an idea, others who possess relevant domain knowledge, others who are suitable test users of an idea, others who may be interested in financially backing the idea, or a combination of all of these. Finding these other individuals poses a significant challenge for many innovators because it is both difficult to find others and to trust them. However, as we have seen from the needs and failings of innovators, this is the ‘bedrock’ of creating sustainable innovation processes. Note that this matchmaking process is not only ‘one-way’. For example other innovators wishing to participate in others ideas projects can also approach the match maker.

Therefore, a central part of the framework is a mediator that enables innovators to find other innovators as well as testers, protection and financial support. This is similar to the concepts of boundary-spanning, collaboration and democratic communication presented by Dombrowski *et al.* (2007), except that it is centred on the individual as opposed to the organization. Note that this can be implemented using a technology platform similar to an innovation intermediary, or via a dedicated roles or bodies.

Importantly, this mediator role or platform not only has the job of finding others, but also creating relatively ‘instant’ trust that allows innovators and individuals to cluster together and work effectively as quickly as possible.

Idea protection

Idea protection refers to the placement of legal and social safeguards around the ownership and use of an idea. This includes further development of and contribution to an idea by other innovators.

As seen from the results of the interviews, one of the greatest concerns of innovators is that their ideas will be used without their consent or planned purpose, or without some form of reward. Incentive and reward are primary concerns of innovators, and in many cases this is not purely financial. Control of an idea is important to ensure that in the eyes of the innovator a satisfactory

outcome is reached. This is also a major factor in choosing who to share an idea with and in the development trust, as protection mitigates the risk of having the idea 'stolen'.

Therefore the protection element of the framework is a guarantee to innovators that their ideas are protected and that their contributions to others are acknowledged. This guarantee is essential to creating 'win-win' situations for all involved parties. This can include the use of user agreements and contracts, being similar to the use of different software licenses. Social rating systems can also be used as a deterrent to 'bad' behaviour. There can also be the use of formal legal protective mechanisms such as patents and trademarks, although these are only employed at later stages of the innovation process.

Regardless of the idea protection mechanisms employed it is essential that intellectual property rights can be pursued and enforced by the individual and that they receive help from the community in protecting their ideas.

Idea techniques

Idea techniques refer to using structured processes and techniques for creativity, enhancement and management of ideas. As outlined in the responses to the survey the general attitude and practice of innovation amongst innovators is one of disorganization. The employment of proven thinking and management idea techniques can increase the value of an idea, outline an easier path to its implementation or spawn other ideas.

This element of the framework involves the use of these techniques to improve an idea. Several techniques, such as *Random Stimulation* (de Bono 1990), may be provided to innovators. This may also include the provisioning of a SME role or review group. A set of agents could automatically apply these methods to review and share an idea, reducing the time and effort spent on the process.

Persistence and mobility

The final aspect of the framework is mobility and persistence. As outlined in the survey, while the

solutions may be triggered around a problem or focus the solution itself comes at a variety of times and places. Mobility refers to the ability to capture ideas ‘on-the-fly’. Ideas need to be able to be captured in multiple locations and contexts. Persistence refers to having one interface to all the innovator’s ideas, regardless of context. While this element is related to methods of idea capture and representation it is based on the underpinning concept of ideas and innovation around an individual.

6.2. Bringing this to the organization

The proposed framework would be of lesser use if it did not support innovation from the perspective of the organization. To assess the viability of the *Innovatia* framework we can compare it to an established organizational innovation framework.

In comparison to the ‘elements of innovative cultures’ presented by Dombrowski *et al.* (2007) the new framework is similar in a variety of aspects. The two are complementary; they address similar issues, but from a different vantage point.

The following diagram shows the mapping between the elements of each framework:

New Framework	Idea Matchmaking	Idea Protection	Idea Techniques	Mobility and Persistence	Not Present
Dombrowski et al.	Democratic Communication Collaboration Boundary spanning	Incentives Safe spaces	Not Present		Vision Statements Flexibility Leadership

Figure 19 - Mapping between the new framework and the elements of innovative cultures

It is evident that the greatest linkage between the frameworks is in idea matchmaking. Finding others who may be interested in developing the idea, regardless of who or where they are, facilitates the communicative elements of innovative cultures. Importantly this element supports boundary-spanning, which is a key process for idea creation and dissemination.

Idea protection provides mechanisms for incentive. Idea protection allows for recognition of contribution, which is an important aspect in organizational environments. This protection also allows for more openness in the innovation process as innovators do not have to worry about ideas being 'stolen'. This also relates to the supporting nature of safe spaces, although this is also an organizational issue.

Idea techniques and Mobility and Persistence are elements of the new framework that are not represented in the 'elements of innovative cultures' (Dombrowski *et al.* 2007). The element of mobility and persistence is primarily concerned with the implementation, although it does reflect the concept that ideas belong to the individual rather than the organization. Technique refers to imposing a small amount of structure on the process. In contrast, 'elements of innovative cultures' are concerned with breaking the structure of the enterprise.

There are also elements of innovative cultures that are uncovered by the new framework. These are not a direct concern from the individual's perspective and thus have been omitted from the new framework. Innovative vision statements refer to an organizational level focus upon innovation as a goal. It is already assumed that the innovator is innovative, and that they will pursue their ideas of their own accord. Flexibility is only applicable to the organization.

In summary, the new framework integrates with organizational frameworks for innovation such as the 'elements of innovative cultures' developed by Dombrowski *et al.* (2007). The integration with the 'elements of innovative cultures' is not surprising; culture itself is an organizational concept which governs and is governed by individuals. The primary difference between the frameworks is that the 'elements of innovative cultures' are targeted towards one particular organization, whereas the new framework is based on the individual perspectives, and it spans across all an individual's organizations.

7. Implementation

The new framework for individual innovation can be implemented in a multitude of ways, and is heavily dependent on the individual and organizational environments. This section presents one method of implementation through the design of a software tool. It borrows a number of concepts and techniques from a range of existing tools and literature and then combines them into a new tool, named *Innovatia*.

7.1. The benefits of a new software tool

The construction of the *Innovatia* tool has a number of benefits. Its implementation of the new framework provides innovation support for individuals and thus leads to more innovation. However, upon more general examination, there are a number of benefits in designing a holistic idea management and innovation tool as opposed to a pure ‘mash up’ of existing tools, services and practices.

The first set of benefits is derived from the use of software to perform idea management. Using a tool to provide end-to-end idea management (excluding the task-level details of project management) has a number of advantages over other implementation methods, including:

- A holistic software tool is easily able to capture, store and represent data over the entire innovation process. The user is thus able to retrieve and modify information on any idea at any given point in time.
- A software tool with a set of agents can assess, suggest, improve and re-evaluate ideas autonomously, based on a set of proven thinking techniques and strategies.
- A software tool can integrate with other instances of itself as well as a range of other services. This gives innovators access to resources outside their immediate context.
- A software tool can be an unbiased intermediary. A computer, when programmed correctly, can ‘match make’ ideas and users without requiring them to find and explicitly disclose their ideas with the other. This concept is as seen in something as simple as the *Facebook’s ‘People you may know’* function.

The second set of benefits arises from its potential to be distributed as an open source tool. While this benefit is beyond the bounds of the design, an open source tool removes a key barrier to

adoption, cost, which creates pathways for individuals and organizations to develop and maintain idea management practices. Of the existing tools surveyed *IdeaBox* was the only open source idea management tool available, and even it is now outdated (only runs on the PHP4 platform). Release of the tool as open source shows conviction in the open innovation paradigm and allows it to adapt and evolve to the direction of the market.

7.2. High level architecture

The *Innovatia* server adapts an N-tier architecture that facilitates collaboration between the client device, *Innovatia* server and a number of external services.

At the highest level the *Innovatia* architecture can be viewed as containing three layers; client, server and external services.

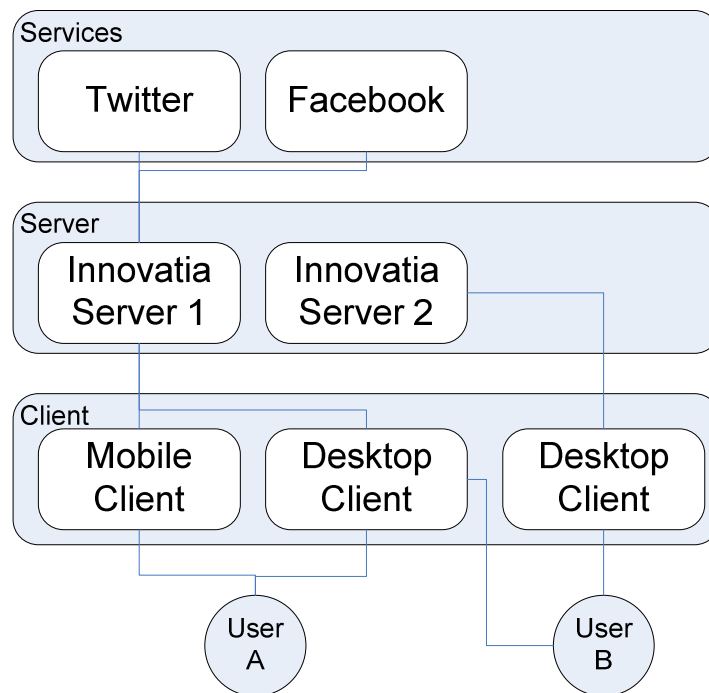


Figure 20 - The Innovatia architecture

The diagram shows the three layers of the architecture; client, server and services, and their relation to the user.

Client layer

The client layer contains the devices that provide the user interface to the *Innovatia* system. These client systems are similar to journal programs that allow the user to work asynchronously from a server. The user can then synchronize their ideas with the server, uploading theirs and downloading updates and others that they may be interested in. These interfaces also allow a user share ideas with others through the server or directly through email and other forms of electronic communication.

Note that as displayed on the diagram, the client may synchronise with any number of servers. This is because users are involved in multiple contexts; they have a number of ideas that may only be relevant to one or two organizations.

Due to the distributed nature of the *Innovatia* system, the primary interface for users is a HTML/Javascript wiki page that can be used offline (similar to *TiddlyWiki*). A specialized lighter interface without extensive offline capability is provided for mobile devices and other browsers. Certain mobile devices are provided with an application specific to that platform.

All communication between a client and server is done through AJAX over HTTP/HTTPS to improve the standardization and usability of the application.

Server layer

The *Innovatia* server holds and manages the ideas throughout the application. It is the core of the *Innovatia* architecture; controlling the flow of ideas between clients, servers and external services. It also utilizes a number of agents to assess, improve and reassess other ideas to users, as well as providing matchmaking services within the server. It is implemented as a dynamic web application (PHP or Java) that runs on a set of application servers. Idea descriptions and media, as well as other information such as user details and groups, are stored in a separate database server.

Services layer

This layer involves the *Innovatia* server sending ideas to a variety of web services, as well as receiving updates from these services. It also performs user management and can integrate with other services (such as *OpenID* and *Facebook Connect*) for this information.

Note that term ‘web services’ does not only pertain to structured innovation tools but to other services as well, such as *Twitter* and *Facebook*. An issue with this form of sharing is that when the idea leaves the domain of the tool it is not fully protected by the *Innovatia* framework and as such it is up to the innovator to determine how much of a particular idea that they wish to share. This layer also includes agents that can find subject matter experts who lie outside the domain of an *Innovatia* server again through the use of external web services.

7.3. Features

Using the flexible architecture proposed above, *Innovatia* provides a number of features. These are detailed below.

Idea Capture

The most basic function of an idea management tool is the ability to capture ideas. *Innovatia* supports multimodality; that is allowing users to represent their ideas in a variety of forms such as text, pictures, audio and drawings. Capture also encompasses updates to ideas and collaboration on a particular idea.

Mobility and Persistence

As detailed in the architecture, *Innovatia* supports individual idea capture while mobile. This allows innovators to retain ideas and to improve them when the idea ‘strikes’. As indicated by survey respondents this was rated highly on the list of features.

This feature is implemented via a persistent set of ideas managed by the server and distribution of the interface via standard web technologies. For major mobile platforms there are also applications that allow the user to make full use of the mobile device capability.

For instance, in the iPhone client, the application allows for the capture of photos, sound and drawings so that the innovator can capture their stimulus or innovation in whatever mode that they choose. These captured representations are then synchronised with the *Innovatia* server for

further analysis and development.

Idea Matchmaking

Innovatia provides automated idea matching between ideas and innovators profiles to find others that may be interested in implementing or assisting the implementation of an idea.

Idea matchmaking is based on a combination of structural and semantic analysis of textual content of one idea, and then comparing this to other ideas in the database. While it would be advantageous to analyse the captured media, such as images and sound for similarity, this is still a largely unknown area in computing. However, this is of a lesser issue as the majority of respondents represented ideas via text.

Idea matchmaking also happens between people and ideas as well. The mediator component of *Innovatia* predicts what a user may be interested in by what other ideas they have created (as above), as well as idea projects they have participated in, their previous roles and their profile data. The mediator identifies these users as falling into three categories; those that are interested in helping, backing, and using ideas.

Note that the mediator is able to extend to other services and sources of information when looking for others. This can include specialized social network crawlers, structured innovation community crawlers as well as general web agents. Each of these searches autonomously, indexing results for future comparison.

Idea Protection

Innovatia protects ideas by implementing a ‘terms of use’ policy and a number of ‘ideas licences’. The terms of use state that the user must respect the intellectual property of others and must abide by the agreements set out with each licence.

Each idea can be published under a different licence. This is similar to the concept of a non-

disclosure agreement; the licence allows the user to view the idea but not disclose or pursue the idea without approval of the innovator. This allows the innovator to share ideas with confidence in the knowledge that their idea is legally and socially protected.

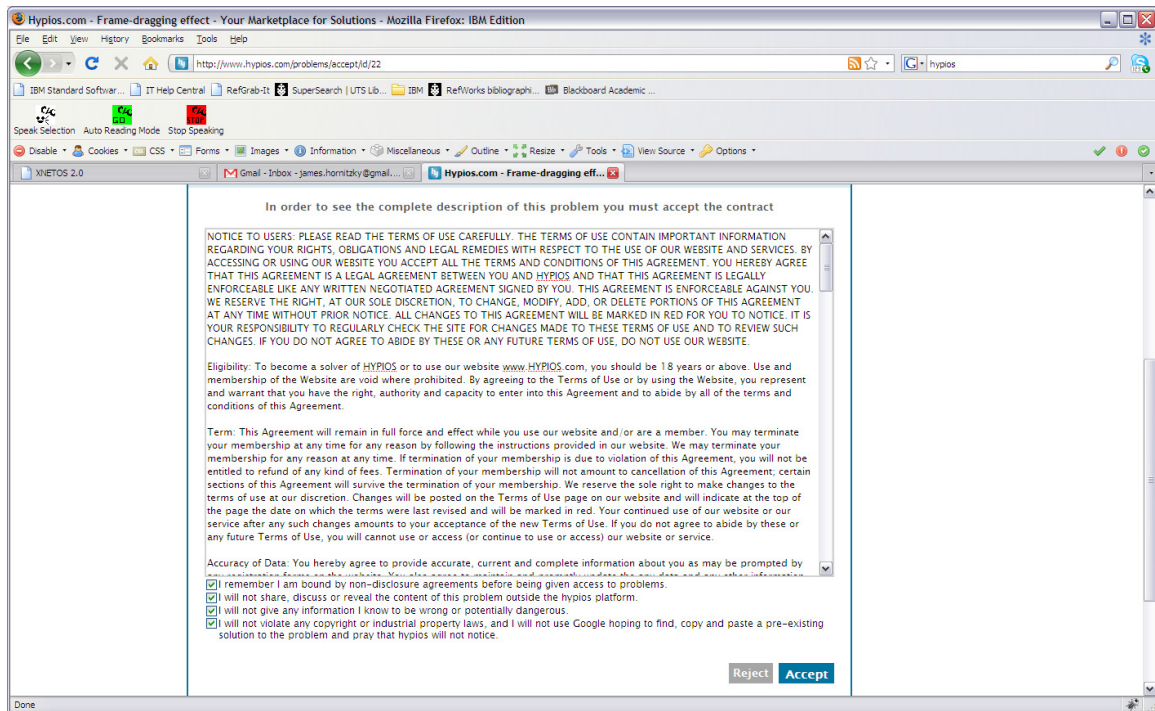


Figure 21 - An example of a non-disclosure agreement used in a tool

Screenshot of a non-disclosure agreement shown to Hypios users before viewing a challenge. In combination with more detailed user activity logs this can be an effective form of protecting intellectual property.

For *Innovatia*, three default agreements are provided. These are:

- The lowest level; a 'free-for-all' agreement that allows anyone to take the idea and use it. Similar to the terms of use of *Creativity Pool*.
- The medium level; an agreement that allows others to take an idea and modify it as long as they provide reference to the idea creator.
- The highest level; no use of the idea without consent from the idea creator. Similar to the use of non-disclosure agreements by *Hypios*.

User activity is traced so that innovators rights are protected. There is also the option of integrating with patent and copyright services; however this is a complex matter that requires further investigation.

Idea Sharing

Innovatia allows the individual to control who they share with. The tool also allows them share outside their immediate context via the process of idea matchmaking, or directly via email or other services. Unfortunately, once the idea ‘leaves’ *Innovatia* it is not protected outside the domain. To circumvent this issue, *Innovatia* allows innovators to choose not only who and where but also what parts of an idea that they wish to share, and can track this in its database for reference. This controlled sharing relates both to the element of idea protection and to the concept of safe spaces in organizations.

Incentive and Reward

Incentive and reward encourages certain action and behaviour. For *Innovatia*, the aim is to promote open innovation. This is implemented in the form of a points system (similar to ‘Brain-Fu’ in *Ideas4All*), as well as a social rating system. These points are not only ‘status’ symbols, but also grant the user higher privileges within their communities, such as being editors, being able to run their own events and being able to advertise on the *Innovatia* system. This makes involvement in the system somewhat game-like; creating an open and fair system that aims to develop ‘flow’.

Note that this system is supplementary to any prizes or incentives provided by companies for solving challenges (in essence ‘trading’ ideas) or otherwise, and can be modified to suit a particular context.

Idea techniques

Innovatia provides a toolset for innovators to create, improve and manage ideas. This includes structured thinking methods as well as tasks performed by the system. As argued by Wood (2003), automatic assessment of an idea can filter ideas for the individual or organization and highlight

areas for improvement. A set of enhancement techniques including de Bono's *Random Stimulation* (1990) are provided. The system also periodically revisits ideas and based on recent activity of users and a set of dynamic ranking criteria can assess the current value of an idea.

7.4. Early implementation and reflection

An early prototype of the *Innovatia* system was implemented as part of this thesis work. This prototype included the creation of an iPhone client, as well as an implementation of the server in PHP.

7.4.1. Prototype features

The primary features of the prototype are:

- Idea capture: Capturing ideas as notes, voice recordings, photos and drawings.
- Persistence and mobility: The ideas are recorded in the iPhone's persistent memory and can be synchronised with the *Innovatia* server.
- Idea sharing: Being able share ideas with the *Innovatia* server as well as directly with others via email or Twitter.

The focus of the prototype was to become an effective mobile ideas capture tool. This is the starting point for building further functionality and already provides a great deal of value to innovators.

7.4.2. Screens

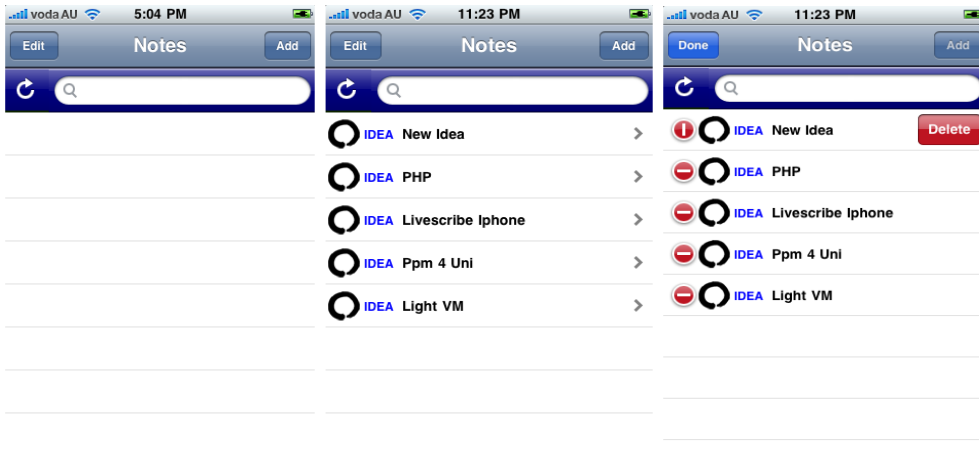
Below each of the screens in the application with are described.

Root View

The root view displays the primary list of notes (i.e. a list of ideas), which is the default entry point for the *Innovatia* Mobile application. Once the application has loaded, a list of ideas their will be presented to the user. On this screen, the user can view at a glance what ideas that they have already written down. They can also delete elements from the list by pressing the edit

button, or search by entering text into the search bar, which updates the view on-the-fly.

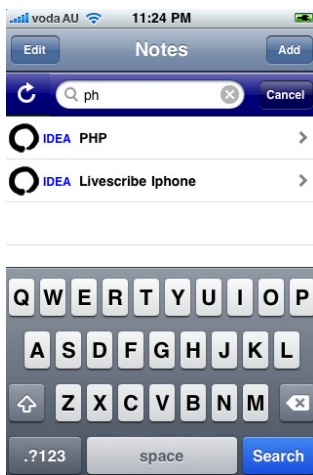
From here, the user may choose to sync the list with an *Innovatia* server by pressing the 'sync' button next to the search bar, or select a particular idea to view more details.



Default loading screen

Ideas list once loaded

Editing the ideas list



Searching the list

Sync View

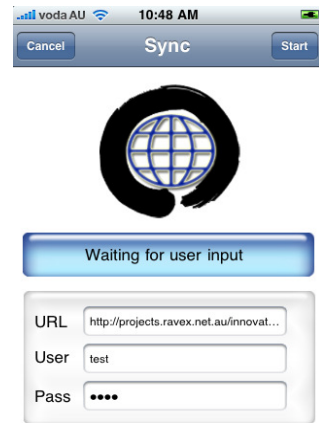
The sync view allows the user to synchronise their ideas list with an *Innovatia* server.

The user must enter their credentials into the text fields, and then press the start button to start the sync.

Status updates will be displayed in the blue header container.

Once synchronisation has completed, the user will be returned to the root view with a UIAlertView confirming the synchronisation.

The user can also click the cancel button to return to the root view.



Note View

The note view allows the user to enter more details about an idea. It allows them to change the title, description. It allows the user to capture a stimulus or other message via camera, sound or drawing.

It also allows a user to share the idea, either via an *Innovatia* server or email.

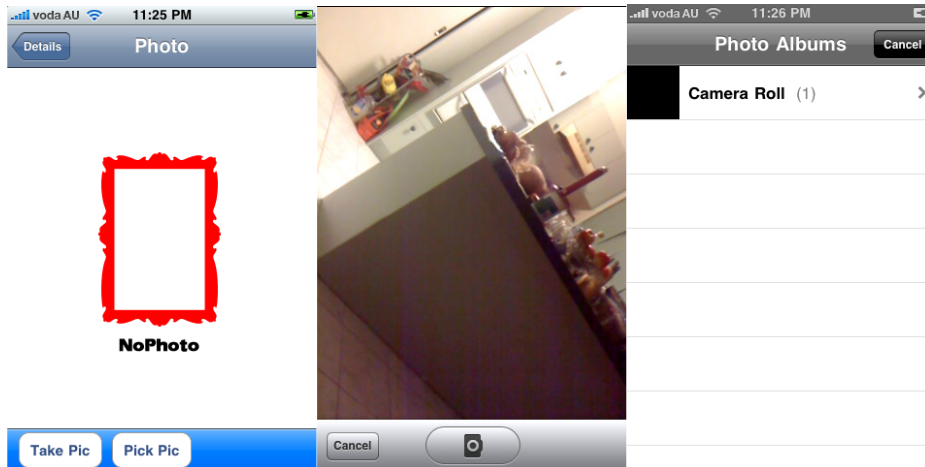
The user can return to the root view by selecting the UINavigationController back button.



Photo View

Photo view allows a user to take a photo via the camera, or to select an existing one using the photo picker. Clicking either of the buttons on this screen opens the respective View Controller.

There is also a delete button that allows the user to remove that image in particular.



Main photo view screen

Taking a photo

Picking a photo

Sound View

The sound view allows a user to make a recording of a particular stimulus, or simply articulate an idea via speech. They can then play the sound back using the playback button.

The user can return to the root view by selecting the UINavigationController back button.

There is also a delete button that allows the user to remove that sound in particular.



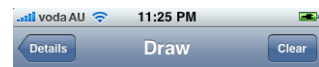
NoSound



Draw View

This view allows the user to add a drawing to their idea. The user can also clear the drawing if required by pressing the clear button.

The user can return to the root view by selecting the UINavigationController back button.



Share View

The share view allows the user to send one particular idea to an Innovatia server.

The user must enter their credentials into the box, and then press the send button to start the sending process.

Status updates will be displayed in the blue header container.

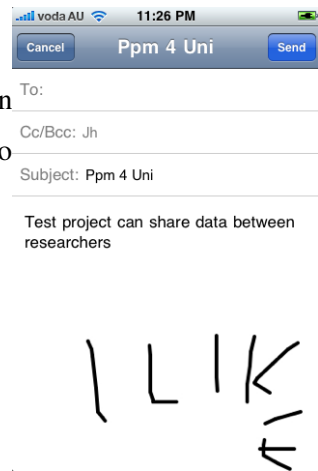
Once synchronisation has completed, the user will be returned to the root view with a UIAlertView confirming the sharing.

The user can also click the cancel button to return to the root view.



Email View

This view uses the MFMailComposeViewController class to send an idea via email. The title is placed into the subject, the description into the body and the pictures and sound as attachments of the email.



Tweet View

This view uses HTTP POST to send updates to the micro-blogging service Twitter. The TwitterRequest class is responsible for management for the transaction.



7.4.3. Preliminary results

From the researcher's use of the application during the 4 month development period, there were 15 ideas created by the researcher. For the majority of these ideas, the researcher had only captured the idea title and a short description. These were all shared with the *Innovatia* server.

The ideas created can be viewed in the test environment⁴, as well on Twitter⁵.

⁴ Test environment URL: <http://projects.ravex.net.au/innovatia20/ideas.php>

⁵ Twitter URL for researcher: <http://twitter.com/jameshornitzky>

8. Conclusion and future work

Innovation is critical to success for all individuals and organizations. Idea creation, capture and management account for a significant part of the innovation process and yet have been widely disregarded by individuals, organizations and society. A small (and growing) number of individuals and organizations have begun to realize this and have moved to implement innovation frameworks in their own contexts.

8.1. Innovation through individuals

However, the role of individuals has been widely neglected in the innovation process with both research and the market focusing their energies towards understanding and supporting innovation from an organizational standpoint. Unlike the common views held by researchers and organizations, individuals are complex rational beings with multiple motives, contexts and interests. Innovators exist both inside and outside the organization, either toiling away at their ideas or trying to find a chance to do so.

This study investigated the mindset of individual innovators to build a better innovation framework for innovation. Through exploring the practices and perceptions of the individual, this study has made a number of important findings and contributions to the field. These are:

- **Changed the common perspective of innovation;** researchers and the market have focused on the organization. However it is individuals that innovate, whether in groups or individually. Their perceptions, motives and practices have been widely ignored, much to the detriment of the innovation field.

Through the interviews and surveys with individual innovators, we have found a number of significant trends and patterns in their perceptions. Individual innovators pursue innovation in an ad-hoc, unstructured way, which opposes the regimented structure of conventional organizational thought. This is an area of improvement for both organizations and individuals. Individual innovators also share with those that they trust. This corresponds to those that share similar values and that are trusted, leading to innovators only progressing and sharing in their immediate context. This stifles innovation as it does not tap into the power of open innovation. Finally, the results of

obtained imply that the underlying motive for innovation exceeds financial incentive. While innovators still pursue innovation with self-centred intent, their goal is often to fulfil a vision and be recognised by others as being successful.

- **Built an understanding of the tools available to innovators;** this study extends previous research into idea management tools and communities by surveying the diverse array of tools and communities across the structured innovation market, as well as a number of viable alternative tools. Most importantly the tools analysis confirmed the organizational focus of the market. The typologies developed from this survey provide a picture of the current SI market and also provide a starting point for individuals and organizations to develop their own tools. The tools analysis also shows the gap in the market for individual focused tools, as well as the huge potential of an open source tool.
- **Developed a framework to support individual innovators;** the outcome of this research was a new understanding of the individual innovator. This outcome is not useful in itself; there need to have methods to address the findings. As such, this paper presents a new framework for innovation.

The new framework proposed defines key focus areas to support and stimulate innovation through individual innovators, including idea matchmaking, protection, techniques and mobility.

Note that while the new framework is different to organizational perceptions of innovation, it still integrates with the organization's innovation goals and frameworks. It espouses many of the same elements and practices of other innovation frameworks, such as Dombrowski *et al* (Dombrowski et al. 2007). It is a complementary framework, and is designed to create innovation that benefits all parties.

An implementation of this framework, a software tool named Innovatia, was also designed and discussed. The *Innovatia* architecture proposed provides innovators with creation and capture of ideas through to sharing, enhancement and implementation. An outcome was an iPhone and server prototype developed for idea capture. This showed promising results from its early implementation, and is an exciting area for further development.

In summary, this thesis presents a new paradigm of mobile open innovation that allows individuals to share and pursue their ideas with greater efficiency and ease. This new perspective

together with the framework improves innovation practice and benefits the productivity of organizations and the world.

8.2. Future work

Given the exploratory nature of this study (or rather re-exploratory) there is a range of dimensions through which future work may continue. These dimensions are:

- Developing algorithms and techniques for assessing and relating ideas, as well as matchmaking these ideas to innovators.
- Exploring new innovative uses of idea protection and methods of obtaining them.
- Exploring crowdsourcing methods of funding start ups and innovation programs.
- Exploring the open intermediaries, their user base, and their success (or lack of) in creating innovation.
- Evaluating in-depth the performance of the open ideas communities and understanding their effect on the SIM market.
- Conducting a number of experiments to psychologically profile innovators, and thereby develop better techniques for harnessing their innovation potential.

However, innovation needs to happen in the ‘here and now’. Rising levels of social and economic crisis can only be overcome through innovation and change. Therefore, the next step from this thesis is to continue development of the *Innovatia* tool, and to test the tool in a community of innovators. Personal experience of the researcher suggests that the university environment would be a prime testing area for the *Innovatia* tool. While the design lacks low-level details, such as the specific algorithms for idea matchmaking, assessment and improvement, pursuing this work in an iterative manner will allow us to develop a deeper understanding of innovation, ground the new framework in reality, and hence build stronger innovation practices that will benefit individuals, organizations and society.

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10. Appendices:

10.1. Appendix A: Focus questions for interviews

The following were the focus areas examined in each of the interviews. Similar questions were pursued along each path while questioning.

Idea Creation

What inspires your ideas?

What triggers your ideas?

When/Where does this happen?

What mind-state does one need to be in?

What techniques or methods have you used?

Do you respond to challenges?

Idea Capture

When you immediately come up with the idea what do you do.

How do you capture an idea?

Do you write it down, draw it or do otherwise?

Idea Sharing

Who do you share your ideas with?

Why?

Who won't you share your ideas with?

Why?

Have you had an idea 'stolen'?

How do you share your ideas?

What prevents you from sharing?

What promotes sharing?

Idea Management

How do you revisit your ideas?

How do you categorize and search them?

Top 3 - What are in your opinion the top three to five features that an idea tool must have

10.2. Appendix B: Survey questions and results

Note that results are stored separately to this document. Only the questions are provided here. Please contact the researcher via email (james.horntizky@gmail.com) for access to the data.

Entrepreneurial Innovator Survey

A survey on Idea Creation, Capture and Management for Innovators

Welcome to the Entrepreneurial Innovation Survey!

By sharing your thoughts and experiences on innovation, you have the chance to provide critical feedback for the development of the Innovatia project. The Innovatia project is about developing a framework and implementing it as a tool to help entrepreneurial innovators 'innovate better'. In case you were wondering, the term 'entrepreneurial innovators' refers to those who produce novel and original products, services and concepts.

The project is part of a Bachelor of Science in Information Technology (Honours) at the University of Technology Sydney. As of such, all data is purely anonymous and kept in line with the University's research policy.

The software produced will be open source, and the final research thesis will be released to the public via the researcher's website.

Thanks in advance for your participation!

Background

This first section is a simple introduction to understand a little more about the style of entrepreneurs answering the survey.

Please ensure that when answering these questions, you are referring to ideas that are entrepreneurial or particularly innovative. For example a new invention, ideas for research projects, new software, new products or services. Essentially any idea that has an original and novel value in a particular field.

1 [1]What is your current employment status? *

Please choose **only one** of the following:

- Full time work
- Part time work
- No work

2 [2]What is your current studying status? *

Please choose **only one** of the following:

- Full time study
- Part time study
- No study

3 [3]Which of the following are your areas of study/expertise? *

Please choose **all** that apply:

- Arts and social sciences
- Business
- Design
- Engineering
- Information Technology
- Law
- Health
- Science
- Other:

4 [4]How many of your innovative/entrepreneurial ideas relate to your field of expertise? *

Please choose **only one** of the following:

- 0-25%
- 25-50%
- 50-75%
- 75-100%

5 [5]How many of your ideas relate directly to an activity or task in your primary occupation. For example, as a student how many ideas relate to or are triggered by a certain subject or assignment? *

Please choose **only one** of the following:

- 0-25%
- 25-50%
- 50-75%
- 75-100%

6 [6]What is the number of innovative entrepreneurial ideas that you have 'come up with' within the past 2 years? (Optional)

Please choose **only one** of the following:

- 0-15
- 15-30
- 30-45
- 45+

Idea Creation

This section explores your approach and experiences with creating/generating an idea.

Please ensure that when answering these questions, you are referring to ideas that are entrepreneurial or particularly innovative. For example a new invention, ideas for research projects, new software, new products or services. Essentially any idea that has a original and novel value in a particular field.

7 [1]Generally, are your ideas created around a problem/focus or at random? *

Please choose **only one** of the following:

- Around a problem/focus
- At random

8 [2]For you, what activity is most likely to spark the creation of ideas? *

Please choose **only one** of the following:

- When watching something
- When listening to something
- When doing something

9 [3]Are the majority of your ideas formed through group discussion or individual activity? *

Please choose **only one** of the following:

- Group discussion
- Individual thought

10 [4]Where do you come up with your ideas? *

Please choose **all** that apply:

- At Home
- At Uni/School
- At Work
- When commuting/travelling
- Other:

11 [5]Do you employ any creativity technique or method that helps you to generate ideas? *

Please choose **only one** of the following:

- Yes
- No

Idea Capture and Management

After generating an idea, many entrepreneurial innovators try to capture an idea. This section covers this practice.

Please ensure that when answering these questions, you are referring to ideas that are entrepreneurial or particularly innovative. For example a new invention, ideas for research projects, new software, new products or services. Essentially any idea that has a original and novel value in a particular field.

12 [1]When you create an idea, what do you immediately do? *

Please choose **only one** of the following:

- Capture it
- Tell someone about it
- Just think about it

13 [2]What methods do you use to capture your idea? *

Please choose **all** that apply:

- Write it down
- Draw it
- Make a voice recording
- Capture the stimulus e.g. take a photo, record the actual sound, etc.
- Other:

14 [3]Which tools do you use to store your ideas? *

Please choose **all** that apply:

- I use a specialized ideas management tool
- I use an online collaboration tools such as a wiki, forum and even Facebook
- I use a wordprocessor/spreadsheet
- I use a paper 'ideas book'
- I keep everything in my mind
- Other:

15 [4]What is most important when assessing the potential of an idea? *

Please number each box in order of preference from 1 to 4

- Profit potential
- Cool factor
- Potential for good
- Ease of implementation

16 [5]Do you have a method for categorizing ideas? *

Please choose **only one** of the following:

- Yes
- No

17 [6]Do you revisit your ideas on a regular basis? *

Please choose **only one** of the following:

- Yes
- No

Idea Enhancement and Sharing

To enhance and promote an idea, entrepreneurial innovators often share their ideas with others.

Please ensure that when answering these questions, you are referring to ideas that are entrepreneurial or particularly innovative. For example a new invention, ideas for research projects, new software, new products or services. Essentially any idea that has a original and novel value in a particular field.

18 [1]Do you have a process, method or technique for improving ideas that you have captured? *

Please choose **only one** of the following:

- Yes
- No

19 [2] Generally, do you choose to share your ideas with others? *

Please choose **only one** of the following:

- Yes
- No

20 [3] Who do you most generally share your ideas with? *

Please choose **only one** of the following:

- Family
- Friends
- Fellow Students/Work Colleagues
- Subject matter experts in your field
- Other

21 [4] In most cases, how do you share your ideas with others? *

Please choose **only one** of the following:

- I have a face to face meeting
- I talk to people, either in person or over the phone
- I email them or use a form of online communication
- Other

22 [5] What is your primary motive for sharing an idea with others? *

Please choose **only one** of the following:

- To gain feedback and develop the idea conceptually
- To try to get others to help you work on the idea
- To try and get funding for the idea implementation
- To be the first to 'claim' an idea
- Other

23 [6] What do you consider the best reward for sharing your ideas?

*

Please choose **only one** of the following:

- Financial reward
- Recognition of your contribution
- The satisfaction of giving
- Being able to create this item or dream that you have

24 [7]Which factor stops you most from sharing with others? *

Please choose **only one** of the following:

- Potential loss of financial reward
- Potential loss of recognition
- Fear of being criticized harshly
- Other

25 [8]Have you ever had anyone take and use your idea without your consent? *

Please choose **only one** of the following:

- Yes
- No

Idea Implementation

After developing an idea, an entrepreneurial innovator will attempt to implement it.

Please ensure that when answering these questions, you are referring to ideas that are entrepreneurial or particularly innovative. For example a new invention, ideas for research projects, new software, new products or services. Essentially any idea that has a original and novel value in a particular field.

26 [1]Have you ever implemented any of your entrepreneurial innovative ideas? *

Please choose **only one** of the following:

- Yes
- No

27 [2]From your perspective, what are the greatest barriers to implementing an idea? Rank the following. *

Please number each box in order of preference from 1 to 5

- Inadequate funding
- Not enough time
- Not having enough people to help and support project
- Not having an effective marketing strategy
- Not having the required level of expertise

28 [3]Overall, how satisfied are you with your current tools and methods for ideation and innovation? (1=Unsatisfied, 5=Satisfied) *

Please choose **only one** of the following:

- 1
- 2

- 3
- 4
- 5

Framework

This final section is about summarizing your overall views on the ideation/innovation process.

Please ensure that when answering these questions, you are referring to ideas that are entrepreneurial or particularly innovative. For example a new invention, ideas for research projects, new software, new products or services. Essentially any idea that has a original and novel value in a particular field.

29 [1]Of the phases of ideation and innovation covered in this survey, which do you consider to be the most important? *

Please choose **only one** of the following:

- Idea Creation
- Idea Capture and Management
- Idea Sharing
- Idea Implementation

30 [2]From an idea management framework/tool, what do you consider to be its most important feature? *

Please number each box in order of preference from 1 to 8

- Mobility: the ability to capture ideas on-the-fly
- Multimodality: the ability to record ideas in different forms, including notes, drawings and voice recordings and so on
- Intellectual property: Having a strong set of privacy and idea protection mechanisms
- Creativity techniques: being able to promote idea generation and enhancement with thinking methods and techniques
- Novelty: An ability to assess an idea automatically for its originality and value
- Support: the ability to link ideas with other ideas to find other interested parties and other similar ideas
- Integration: ability to publish ideas to other services and share ideas outside the one tool
- Persistence: Having the one synchronised interface to all your ideas

10.3. Appendix C: Prototype code

This section introduces the classes composing of the Innovatia mobile iPhone application. The code for the prototype is located in the UTS Innovation and Enterprise lab code repository. For access to code, please contact the writer via email at james.hornitzky@gmail.com.

AppDelegate

Simple starting point in the application, the appDelegate loads the RootViewController into the window and retrieves the data to put into it (i.e. the main UITableView).

Note

Object representation of a particular idea. Also contains code for writing itself to the DB.

TwitterRequest

An object controlling the sending of an idea to twitter.

RootViewController

The RootViewController controls the main tableview that is the ideas list. It implements the tableViewDelegate protocol to control the creation of IdeaCells and manage them in DB and UI.

NoteCell

Represents a single idea in the RootViewController table view. Simple class that contains only formatting and display code.

NoteViewController

The Note view controller controls the entering of details for a particular idea. It performs management of the idea title, description in both UI and DB (via a Note object). It also controls the views that allow the user to share or capture information on an idea. Given the structure of email in the iPhone SDK, it also controls passing the required parameters to the iPhone default email application via inter-application URL communication.

ShareViewController

Controls the sending of a particular idea to an Innovatia survey using a HTTP POST Request.

PhotoViewController

Allows a user to take a photo or use an existing photo from the library. Displays it using an imageView. Implements the UIImagePickerControllerDelegate protocol. Uses the document directory for storage of the photos.

SoundViewController

Allows a user to record the sound using the AVAudioSession and AVAudioRecorder. Also allows playback via the AVAudioPlayer. Implements respective protocols for each of these features. Uses the document directory for storage of the sound files.

DrawViewController

Controls the drawing application. Receives touch events and uses these to draw using the UIGraphicsContext. Uses the document directory for storage of the drawings.

SyncViewController

Controls the complex process of synchronising data with the server.

TwitViewController

Controls the posting of ideas to twitter.

10.4. Appendix D: Tools matrix

Name	Type	Focus	URL
Innovation Xchange	Commercial organizational tool	Matchmaking service for those requiring problems to be solved and innovators. Has specialized roles for mediation.	http://www.ixc.com.au/home.html
Creativity pool	Open intermediary	Open 'free for all' ideas forum. Implements no idea protection, although it does implement an 'honesty box' reward system.	http://www.creativitypool.com/
IBM Thinkplace	Commercial organizational tool	Closed innovation tool for collecting sharing and tracking ideas. Only used within IBM.	http://domino.watson.ibm.com/comm/www_innovate.nsf/pages/ourselves.thinkplace.html
BrainBank Idealink	Commercial organizational tool	Commercial organizational tool sold to organizations. Has a large array of features and customizable modules.	http://www.brainbankinc.com/idealinkCustom.aspx
Ingenuity Bank	Commercial organizational tool	Commercial organizational tool. Has a heavy focus on creativity methods dedicated to breakthrough innovation.	http://www.ingenuitybank.com/
WriIdea	Individual tool	Individual idea management and sharing service. Present a clean interface that quickly allows one to record ideas. Also includes developer API.	http://wridea.com
UserVoice	User innovation	A commercial User innovation intermediary that allows companies to setup discussion forums where users vote for and discuss the company's ideas and products.	http://uservoice.com/

Name	Type	Focus	URL
Kluster	Commercial organizational tool	An online service that provides a meeting place. Is based around assigning weights to ideas and the opinions of certain people within the group.	http://www.kluster.com/buy/features
IBM Jam Events	User innovation	A series of User innovation events run on IBMs own communications platform. Is an ongoing initiative rather than a tool or community	https://www.collaborationjam.com/
Ideas4All	Open intermediary	Open free for all ideas sharing community.	http://www.ideas4all.com
Innovation Commons	Open intermediary	Open free for all ideas sharing community. This community is backed by a number of well-known companies and government entities. It originates from India.	www.innovationcommons.org
Imaginatik Idea Central	Commercial organizational tool	Provides a range of features and based around a comprehensive organizational innovation process. Has been the subject a case study in Lamont 2004.	http://www.imaginatik.com/web.nsf/docs/prod_idc_overview
Global Ideas Bank	Open intermediary	A social innovation initiative born out of earlier work in social invention. Similar to many of the other open intermediaries.	http://www.globalideasbank.org/site/about/
NineSigma	Commercial innovation intermediary	A commercial innovation intermediary that is essentially an RFP negotiations tool. Note that this means it is a meeting place between organizations and teams rather than smaller groups of innovators. Majority of current projects are environmental issues.	http://www.ninesigma.com/

Name	Type	Focus	URL
Big Idea Group	Commercial innovation intermediary	Commercial community for solving problems. The Big Idea Group organization provides consulting services that span end to end in the organizational innovation process.	http://www.bigideagroup.net/
Shanghai Silicon IP Exchange	Commercial innovation intermediary	IP marketplace specific to semi conductors.	http://www.ssipex.com/ssipex/index.asp?language=English
Ocean Tomo	Commercial innovation intermediary	IP merchant banker. Provides investment and brokerage of IP (particularly patents).	http://www.oceantomo.com/
IdeaBox	Open intermediary	Open source software that is a suggestion box for ideas. Currently outdated.	http://ideabox.phpoutsourcing.com/
SharingIdeas.org	Open intermediary	Open innovation forum. However is not maintained.	http://www.sharingideas.org
Inventor Spot	Open intermediary	Meeting place for inventors and their inventions. Also presents article on new inventions from around the globe.	http://inventorspot.com/
Atizo	Commercial innovation intermediary	A commercial intermediary based out of Germany. Has an active community with a range of companies involved.	http://www.atizo.com/
Smiths 'do-us-a-flavour'	User innovation	An example of a consumer-based ideas competition.	http://www.smithsdousaflavour.com.au/
Open government	Open intermediary	Government policy think tank. An example of one of the few open intermediaries with direction and purpose. Similar to the 20-20 summit held in Australia except it is a longer term policy.	http://www.whitehouse.gov/Open/

Name	Type	Focus	URL
Akiva Webboard with Idea Management	Commercial organizational tool	Collaborative tool for knowledge and idea management.	http://www.akiva.com/default.asp?id=16&l=1
BrightIdea.com	Commercial organizational tool	A suite of three components that provide management of an organizations innovation pipeline; that is from ideation to implementation.	http://www.brightidea.com/new.biz
Engage ThoughtWare	Commercial organizational tool	A collaboration suite for idea management and innovation. Interestingly it provides social networking information and search to innovators, allowing them not only to find common interests but also build that past history of trust.	http://www.engagethoughtware.com/index.php
INPAQT Innovation Management System	Commercial organizational tool	A Dutch firm that provides a custom toolset for innovation management. Is partnered with its consulting services.	http://www.inpaqt.nl/index.php?id=2
Idealyst	User innovation	An online brainstorming tool with built in support for rewards (including cash prizes and more).	http://www.ams-inc.com/npd/idealyst.asp
IdeaValue	Commercial organizational tool	A set of tools that provides idea management and innovation process management features. Based out of France.	http://www.ideavalue.com/default-us.htm
INCENT iDS	Commercial organizational tool	Offers software both for idea management and continuous innovation processes.	http://www.incentsolutions.com/Tracking.aspx
Innovator - MindMatters Technologies	Commercial organizational tool	Idea management solution. Has a heavy emphasis on stage gates and review processes, including executive and team lead level reviews.	http://www.us-mindmatters.com/products/index.asp

Name	Type	Focus	URL
Insight Results	Commercial organizational tool	Innovation management software with features for each part of the innovation process.	http://www.insightresults.com/index.php
Jenni Enterprise Idea Management	Commercial organizational tool	Innovation management software that is focused around strategy and challenges.	http://www.jpj.com/jenni/index.php
Prism Idea Management	Commercial organizational tool	Comprehensive set of idea management function, particularly around supplementing the review process.	http://www.isde.com/
SimNet from TQS	Commercial organizational tool	Workflow based idea management system.	http://www.tqs-sim.com/SimNet8.aspx
Spigit	Commercial organizational tool	Comprehensive Idea management solution. Utilizes agent technology to filter and rank ideas.	http://www.spigit.com/
Target Idea Management for mySAP	Commercial organizational tool	Idea management software tightly coupled with consulting services. Utilizes the SAP platform.	http://www.target-soft.com/en/Target_Group/Target_Group.php
Innovation Exchange	Commercial innovation intermediary	Commercial innovation intermediary.	http://www.innovationexchange.com/
InnoCentive	Commercial innovation intermediary	High technology focused commercial intermediary.	innocentive.com
Open Innovation projects	Open intermediary	Community focused around open source IT and other innovation projects. One of the fewer examples of open intermediaries that act as funnels to projects, rather than free for alls.	http://open-innovation-projects.org/project-list/?start=10

Name	Type	Focus	URL
Yet2.com	Commercial innovation intermediary	Online services for challengers and finders based on technology applications	http://www.yet2.com/app/about/home
FellowForce	User innovation	Commercial firm that acts as a message board for organizations, although also has a challenge-based dynamic.	http://www.fellowforce.com/
TekScout	Commercial innovation intermediary	Commercial intermediary for solutions to science and engineering probes and issues.	http://www.tekscout.com/Default.aspx
Idea Connection	Commercial innovation intermediary	A commercial intermediary providing a space for businesses to have problems solved. Interestingly, also implements an ideas discussion, although it is no where near successful as other open intermediaries. Shows how the two dynamics (commercial and open) may be merged.	http://www.ideaconnection.com/
IdeaMagnet	User innovation	A commercial tool for user innovation.	http://www.idea-magnet.com/
Hypios	Commercial innovation intermediary	A commercial innovation intermediary. Interestingly attempts to build its own social network of innovators in the style of Facebook.	www.hypios.com
ThinkCycle	Open intermediary	A meeting place for innovators started as an initiative by MIT. Has different forms of IP	www.thinkcycle.org
Sparks	Individual tool	iPhone application for managing ideas and tasks.	http://sparks.elemental-tools.com/
Manage My Ideas	Individual tool	Individual tool for recording word descriptions of ideas in lists. Similar and simpler than Wridea	managemyideas.org

Name	Type	Focus	URL
IdeaScale	User innovation	User innovation platform for organizations.	http://www.ideascale.com/
GetSatisfaction	User innovation	Commercial user innovation community that hosts a number of companies and consumers of their products. Allows companies to receive feedback and to post challenges and other information.	http://getsatisfaction.com/
Dell IdeaStorm	User innovation	Dell's own suggestion box for ideas relating to its products.	www.idealstorm.com/
Kindling	Commercial organizational tool	Commercial tool delivered via SAAS for idea management.	http://www.kindlingapp.com/howitworks
Brightspark	User innovation	Commercial user innovation tool for organizations.	http://www.brightsparkapp.com/
Qmarkets	Commercial organizational tool	Commercial tool based on a simple four step process of idea management.	http://innovation.qmarkets.net/?qm_stats=200#idea-management/overview
IdeaNet	Commercial organizational tool	Commercial tool for idea management.	http://www.innovationfactory.eu/how-do-we-do-it/tools/ideanet/

10.5. Appendix E: Alternatives matrix

Name	Model	Type	Focus	URL
Google Groups	Service	Discussion Groups	A discussion group service, integrated with many of Google's other offerings.	groups.google.com/
Gmail	Service	Email	Email service provided by Google, with strong search and sorting features.	mail.google.com
phpBB	Open Source Tool	Forum	PHP and MySQL billboard. Widely used.	www.phpbb.com/
miniBB	Open Source Tool	Forum	A more extensible and customizable PHP billboard.	http://www.minibb.com/
FreeMind	Open Source Tool	Mind mapping	A Java based personal mapping tool for organizing ones thoughts and ideas.	http://freemind.sourceforge.net/wiki/index.php/Main_Page
MindMeister	Service	Mind mapping	A web-based mind mapping tool. Relies heavily upon the use of javascript.	http://www.mindmeister.com/
Ning	Service	Social Network	Social Network that allows users to create spaces for their own social networks.	www.ning.com/
Elgg	Open Source Tool	Social Network	Open source social network tool with Facebook like functionality.	elgg.org
Facebook	Service	Social Network	Widely used and well-known social networking tool. Already used by the IDEAS group.	facebook.com
AudioBoo	Service	Social Network	Social blogging with audio clips.	audioboo.fm

Twitter	Service	Social Network	Social blogging service.	twitter.com
MediaWiki	Open Source Tool	Wiki	Open source wiki tool. Widely used and developed wiki package. Powers Wikipedia.	http://www.mediawiki.org/
TiddlyWiki	Open Source Tool	Wiki	Personal, portable wiki that replicates a journal via the browser. Has searching, tagging and sorting functions. Uses a javascript framework to replicate these features.	www.tiddlywiki.com
phpTiddlyWiki	Open Source Tool	Wiki	Modified Tiddlywiki with PHP backend for transferring data across contexts. Demonstrates a desktop client would be implemented in the Innovatia framework.	www.patrickcurry.com/tiddly/
Google Docs	Service	Word processor/ spreadsheet	Offers document and spreadsheet creation and editing functionality.	http://docs.google.com/
Google Wave	Service	Wave	A new, closed beta service from Google that presents a mix of email, wiki and discussion group features.	wave.google.com/
Zocalo	Open Source Tool	IAM	Information aggregation prediction market tool	http://zocalo.sourceforge.net/
Google Moderator	Service	IAM	A service for polling and rating ideas.	http://moderator.appspot.com/