

The Art of Idea Harvesting

CogniStreamer White Paper



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Contents

| | |
|---|----|
| The Art of Idea Harvesting | 4 |
| Description and scope | 4 |
| Balancing the quantity and quality of ideas | 4 |
| Eliminating screening bottlenecks | 5 |
| Minimizing assessment risks..... | 5 |
| The Art of Idea Harvesting - Main Activities | 7 |
| Triggering Ideas | 7 |
| Capturing Ideas..... | 8 |
| Organizing Ideas | 10 |
| Shaping Ideas..... | 13 |
| Idea Portfolio Management..... | 13 |
| Relations with other Practice Areas (*) | 16 |
| Art of Openness..... | 16 |
| Art of Focusing..... | 16 |
| Art of Optimizing the Impact of Critical Resources..... | 16 |
| Art of Idea Valuation..... | 16 |
| Art of Innovation Stimulation | 17 |
| Questions/Checklist..... | 17 |
| References | 17 |

This white paper is adapted from the eponymous chapter in the book “The Art of Software Innovation”. The original publication is available at www.springerlink.com

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The Art of Idea Harvesting

Description and scope

Idea harvesting is quite straightforward as a concept. It is about capturing and storing ideas as they emerge from different sources across and beyond the organization (i.e., ideation) and subsequently shaping them into high-value concepts (i.e., concept definition) ready for further exploration.

As simple as it may seem, the practice of idea harvesting is not trivial.

In this practice area, we do not put much focus on idea generation and creativity techniques. The real issue here is how to trigger the idea generation process and then – after the ideas have been generated – how to capture and further process the ideas. Later in this paper, we cover the different activities related to idea harvesting (the *how's*) in detail, but first we start by explaining the challenges at hand (the *why's*).

The Art of Idea Harvesting focuses on addressing three specific problem domains:

- **balancing the quantity and quality of ideas**
- **eliminating screening bottlenecks**
- **minimizing assessment risks**

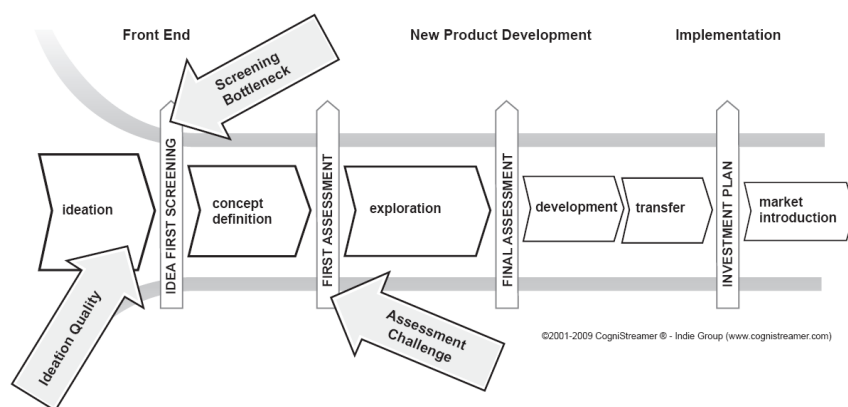


Figure 1 - Common problems related to the art of idea harvesting

Balancing the quantity and quality of ideas

In order to increase the value, number and success probability of ideas and concepts entering the development process, software companies have to evolve from a closed innovation process controlled by a centralized and collocated research team towards a more open, collaborative way of innovating.

The opening up of the ideation stage of the innovation process to larger groups has proven to have a strong positive effect on the number of harvested ideas (Valacich, Dennis and Nunamaker, 1992). The downside of open ideation or crowdsourcing, however, is that the quality of the idea portfolio – expressed as the ratio of radical ideas (i.e., ideas touching a solution or problem areas that are new to the company and still have to be explored) versus incremental ideas (i.e., ideas that stay well within a company’s trusted solution and market domains) – does actually deteriorate. Of course, it could be argued that the quality ratio does not really matter because the probability of ending up with more radical ideas does increase with quantity – albeit not proportionately (Reinig and Briggs, 2008). The consequence, however, is that the huge number of ideas that has to be harvested for that purpose may cause a screening bottleneck downstream, which should be avoided in order to drive a constant flow of ideas towards implementation in the development process. Hence, in order to maintain a good balance between quantity and quality, it is crucial to give **strategic guidance and focus** to an innovation community. The harvesting of ideas should therefore not be restricted to capturing unsolicited ideas. It is also good practice to solicit ideas actively through targeted innovation campaigns.

Eliminating screening bottlenecks

Crowd sourced ideation often introduces a strong first-screening problem because of the large number of unstructured ideas that is injected into the innovation funnel. The scarcity of review resources, the sequential nature of the screening process and the high uncertainty of determining the success probability of ideas and concepts causes a bottleneck at the front end, which in turn threatens to stall the complete innovation process. Once people start to feel that their ideas remain ‘undealt with’, they will eventually stop sharing them. We will come back to the motivational aspects of idea generation in more detail later, but it must be clear that a good process backbone is needed to build and sustain a strong innovation culture.

There are several approaches to improving screening efficiency, but most companies tackle this problem by implementing a **professional idea management software tool** (an option that is generally preferred over the more expensive alternative of increasing screening resources and frequency). The market of idea and innovation management tools is growing exponentially, and many solutions are available today, from very simple and low cost solutions to very advanced and expensive ones. They all offer some kind of Web 2.0 aggregation technology to identify, track, filter, rank and analyse ideas in order to improve screening efficiency. Most tools use a simple collaborative filtering algorithm based on explicit voting. More advanced tools use aggregators that predict the future success of ideas with complex algorithms that combine explicit peer-review data (voting and scoring) with implicit community behavioural data such as page views, ratings, social bookmarks and tags.

Minimizing assessment risks

Opening up the front end of innovation and successfully addressing the above-mentioned challenges eventually results in rich and valuable ideas or concepts being produced. The final challenge is then to choose which ideas or concepts to invest in for further development. This is a difficult decision due to the high uncertainty in the early development stage. On the other hand, there is little room for error, as the cost of failure increases exponentially from this point onward.

The basic approach to minimizing assessment risks is to evaluate the idea or concept from as many different and diverse angles as possible. Here too, software technology can bring an answer. Collaborative innovation management systems tackle this assessment challenge by tapping into the collective intelligence of large innovation networks using **group decision support systems (GDSS)**. The clear benefits of using a GDSS (over more

traditional assessment techniques) are more precise communication and cross-pollination (members are empowered to build on the ideas of others), leading to a more objective evaluation of ideas.

The Art of Idea Harvesting - Main Activities

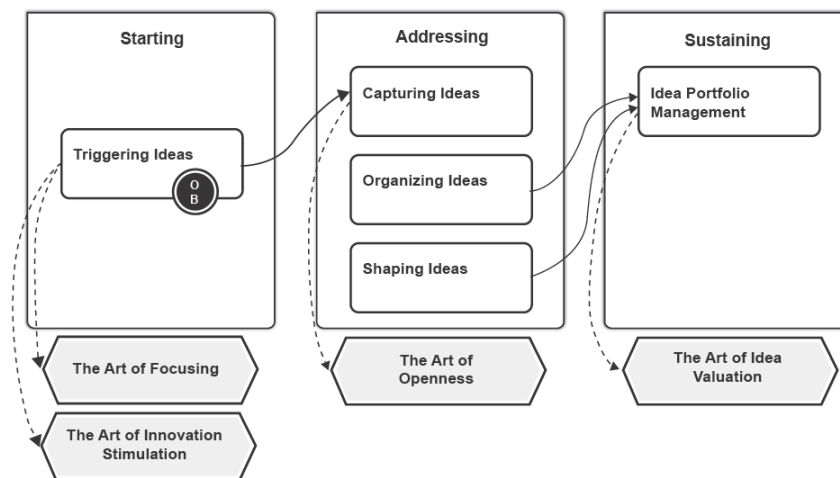


Figure 2 - Main activities of the art of idea harvesting

There are several ways to organize and structure idea harvesting, depending on the specific innovation strategy (e.g., incremental vs radical, tech push vs market pull ...) and the goals that need to be achieved, but any process will usually consist of five major activities:

- Triggering Ideas
- Capturing Ideas
- Organizing Ideas
- Shaping ideas
- Idea Portfolio Management

Triggering Ideas

There are two basic approaches to triggering ideas. The first is to call for ideas through targeted innovation challenges or idea campaigns (i.e., solicited ideation).

The second approach is to create an innovative culture that stimulates people to share their ideas spontaneously (i.e., unsolicited ideation). Stimulating creativity by fostering the right innovation culture is a practice area in itself dedicated to creating an inspiring environment to encourage internal and external people to generate and share ideas. In order to turn ideation into a continuous and self-sustaining process, however, the stimulation of spontaneous ideation should also be strongly embedded into the idea harvesting process, mainly by providing effective **inspiration** and **feedback** channels.

Inspiration

Inspiration can come from many different sources but probably first from other people's ideas. The provision of a transparent **repository in which to browse and search for all ideas** will trigger many new ideas. Repositories as such tend to fill up with a huge number of very diverse ideas over time, and it is necessary to provide additional tools such as recommender systems or social bookmarking to help users find ideas that may inspire them. Most idea management systems let users vote and tag other ideas and then use these votes and tags to suggest other

links they may find interesting. High-end tools use advanced recommendation algorithms or correlation engines to achieve cross-fertilization of ideas.

As well as ideas, other types of content such as papers, blog posts, news articles, etc. can inspire users and trigger new ideas. When setting up an environment for capturing and sharing ideas, it is therefore good practice to allow users to also **publish and share experience and knowledge** in all possible formats.

Feedback

It is very important that idea owners are able to follow up the status and progress of the ideas that they (and others) have submitted. **Efficient and transparent feedback** channels are therefore a key requirement of any idea harvesting system. Feedback can be partially automated and communicated through e-mail notifications or dashboard messages that are generated based on user activity data. Peers or superiors should also give feedback about ideas or other contributions in a personal way during informal and even formal conversations.

Capturing Ideas

The main concern here is to capture all ideas. In order to master the activity of capturing ideas, there are four important aspects to look into: **openness, accessibility, ubiquity and diversity**.

Openness

Idea management software tools have become widely accepted in most industries because of their effectiveness at harvesting ideas. The level of openness of such systems varies greatly from one company to another.

When companies start to adopt idea management tools they usually opt for a closed system in which access is only granted to internal employees, i.e., **closed ideation**.

More experienced companies will gradually open up their ideation system to selected external partners such as university labs, knowledge centres or key suppliers, i.e., **semi-open ideation**.

The use of true Ideagoras – places on the Internet where large numbers of people and/or businesses gather to share ideas – is growing in importance, and an increasing number of companies have already successfully adopted this strategy, i.e., **open ideation**.

Ideagoras fall into three broad categories:

- *True-market Ideagoras*

Intermediary brokers organizing ideation campaigns for their clients set up this type of Ideagora. Contributors (or problem solvers) are usually attracted and incentivized with cash rewards or prizes. Well-known market Ideagoras are innocentive.com, yet2.com and ninesigma.com.

- *Competition-based Ideagoras*

A competition-based Ideagora generally works on one specific problem or challenge launched by one promoting company. The competition is usually open to anyone, offering a chance to win prize money for solving a problem. A well-known example in the software industry is the US video rental company Netflix's competition to improve its recommendation algorithm, offering a \$1 million prize to the winner.

- *B2C Ideagoras*

This type of corporate Ideagora engages customers to bring in ideas on ways to improve a company's product or service. They are typically hosted by big companies with strong brands. B2C Ideagoras tend to generate incremental ideas that are generally not rewarded financially. Two very popular examples are mystarbucksidea.com and Dell's IdeaStorm.

Accessibility

It should be extremely simple and straightforward to submit and share ideas. It should not take more than a few seconds for anybody to submit an idea; otherwise people will not bother. Idea forms should be very basic: an idea title and a short description should be all that is needed to capture and register an idea. Remember that this is the only and most important thing at this stage. It is not a problem that the idea will not be fully fleshed out. Many companies make the mistake of forcing users to fill in complex idea forms with many mandatory fields. This will discourage idea submitters and many ideas will never make it to the submit button. There will be enough time later to complete the ideas.

Ubiquity

Ideas can emerge during many activities and in different places: discussions with people in meeting rooms, producing reports behind a desk, interacting with others at the coffee machine, handling requests from customers on the phone, reading reports on the train ...

Capturing ideas where and when they occur is key to successful idea harvesting. Idea management systems should therefore be ubiquitous, i.e., accessible anywhere, at any time and through any media, e.g., smartphones, LANs, the Internet, messaging software and e-mail clients. In the specific case of software or software-intensive products, ubiquity can also be achieved by integrating online idea publishing functionality into the software itself. As already mentioned in the introduction to this practice area, this is a unique opportunity for software companies and it is currently not being exploited fully.

Diversity

On a personal level, diversity triggers alternative ways of thinking and behaving. Hence, people who live in intersections of social worlds (i.e., people on the 'edge' of organizations) tend to have better ideas than people with a higher network constraint (Burt, 2003).

The identification and management of idea sources for maximum diversity is therefore crucial to harvesting quality ideas. Diversity means involvement of people from multiple disciplines in the ideation process, internal sources (marketing, sales or engineering) as well as external sources (research partners, suppliers, customers and end-users).

With applications such as Facebook and Twitter, software technology has become deeply social. As such, it has become a key enabler to exploit effectively the diversity of large user communities. Through social software, end-users can become an integral part of the innovation and development ecosystem. As a consequence, products are becoming dynamic in the sense that they are not merely consumed or used as they are but are customized, redesigned or even re-engineered to fit the specific requirements of individual users or user groups (von Hippel,

2005). Social media are an important source for innovation. Observing and listening to these channels in order to capture new ideas must become a best practice in every company.

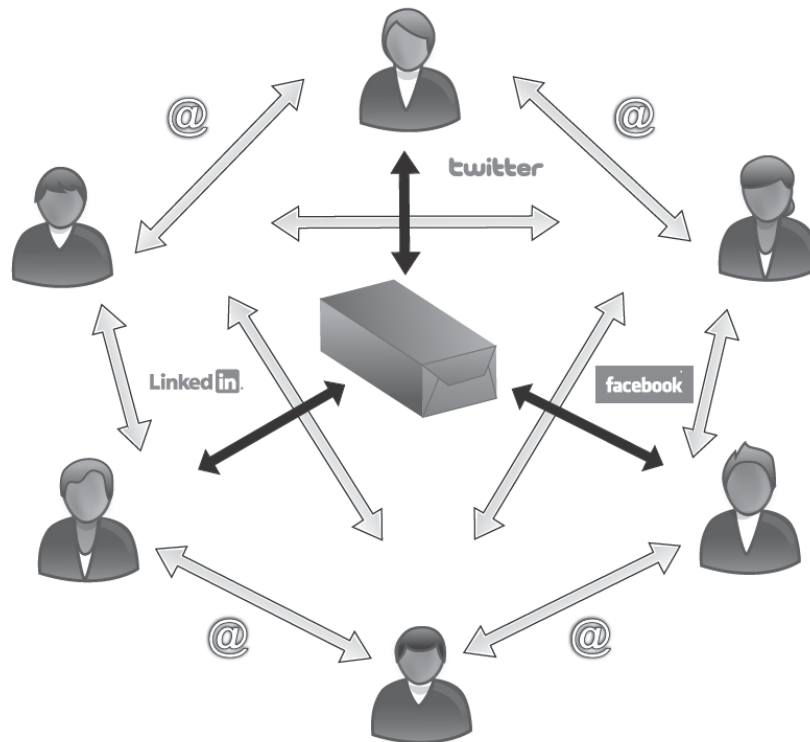


Figure 3 - Networked innovation

Organizing Ideas

This activity consists of filtering, merging, ranking and/or clustering all captured ideas in order to prepare them for further processing. Depending on the innovation strategy and the expected outcomes, however, the organization (and processing) of ideas has to be managed in different ways.

There are four types of innovation, which are visualised in the graphics below (core growth, market pull, technology push and basic research), though in fact only Classes I, II and III are relevant domains for applying idea-harvesting techniques. Basic research (Class IV) innovation falls outside the scope of this practice area because it is a highly knowledge-centric domain. As such, ideas cannot really exist in this space of unknown unknowns because in order to be explicit they must be linked to at least one known problem or solution domain. Hence, there is less need for a true idea harvesting system here. A collaborative knowledge management system is a much better option.

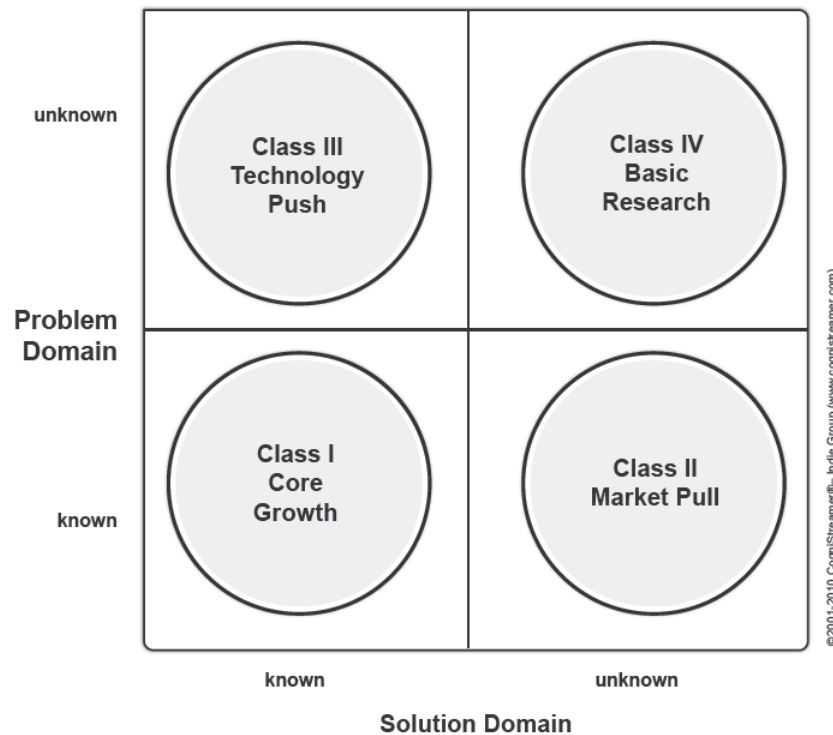


Figure 4 - Four types of innovation

Organizing class I ideas

For core growth ideas (incremental or Class I innovation), a sequential process-driven approach is most common. The basic concept is to separate the good ideas from the bad ones based on simple quantitative criteria such as cost/benefit ratio, technical feasibility and development cost. Less than 20% of all ideas usually survive this initial screening, with other ideas being ‘killed’ or archived.

Here, the main challenge is to design a process that can screen **large numbers of ideas**. This problem is usually tackled by tapping into the collective intelligence of an innovation network through community voting, based on the popular theory from Surowiecki (2004) (Wisdom of Crowds) that the aggregation of information within a community can lead to better decisions – better than could have been made by any single member of the group. In practice, screening algorithms based on explicit voting prove to be effective in solving screening bottlenecks, but the quality of the filtering may still be questioned. (Are we sure we did not ‘kill’ good ideas?)

In order to improve screening quality, more advanced innovation platforms try to predict the future success of ideas with collaborative ranking algorithms that combine explicit voting with implicit community behaviour data such as page views, ratings, bookmarks and tags. Provided these algorithms have used the correct association rules, i.e., the relation between the value of an idea and a certain activity (e.g., bookmarking), this approach has proven effective. The key issue, however, is that association rules differ from one community to another due to the variation in behavioural patterns, and they are influenced by cultural, social and other differences. Community behaviour also tends to change over time within the same community. As a consequence, the fine-tuning of these algorithms (usually by trial and error) is a complex, time-consuming and never-ending effort.

In order to solve the problem described above, a new generation of algorithms is emerging. These adaptive (or self-tuning) collaborative ranking algorithms use data mining to extract association rules from activity facts in

relation to the success rate of ideas. In other words, the algorithms seek relations between the collaborative behaviour of an online innovation community and the value of the ideas and concepts it generates in order to predict the value of new ideas based on these behavioural patterns.

Organizing class II & III ideas

For radical innovation (or Class II and III innovation), a sequential process will not do because ideas need to develop organically before being subjected to a quantitative assessment. Pushing ideas through a quantitative assessment would simply kill most of the so-called 'out-of-the-box' ideas, which are exactly the type of ideas that are needed for this kind of innovation. Instead, the organization of ideas should focus on finding and clustering those ideas that carry a germ of a strong innovative concept and need to be developed further during incubation. Hence, instead of a process-centric approach, a people- (or network-) centric approach is more appropriate. In Class II and III innovation, an emergent and people-centric collaborative model is therefore better than the Class I sequential and process-focused stage gate model.

The core architecture of such 'collaborative systems' is built around creation spaces in which communities can address innovation opportunities and challenges, generate and share ideas and insights and shape them into strong concepts with strategic value for the company.

In order to facilitate the process of filtering and clustering ideas, these systems apply the concept of '**Collaborative filtering**'. Collaborative filtering is part of a bigger concept called 'harnessing collective intelligence' (coined by O'Reilly 2006), which refers to using advanced social science algorithms to identify, track, filter, rank and analyse social media content. It also includes applying semantic technology to track discussions on specific topics and analysing the share of voice and tonal sentiment.

Collaborative Filtering

The term collaborative filtering was first used by David Goldberg at Xerox PARC in 1992 in a paper called 'Using collaborative filtering to weave an information tapestry'. He designed a system called Tapestry that allowed people to annotate documents as either interesting or uninteresting and he used this information to filter documents for other people.

There are now hundreds of web sites that employ some kind of collaborative filtering algorithm for movies, music, books, dating, shopping, other web sites, podcasts, articles and even jokes.

Examples of 'Harnessing Collective Intelligence':

- *PageRank algorithm (Google)*
- *'interestingness' algorithm (Flickr)*
- *'people who bought this also bought...' feature (Amazon)*
- *'similar artist radio' algorithm (Last.fm)*
- *reputation system (eBay)*
- *AdSense (Google)*

Shaping Ideas

As idea submission has to be made extremely, it is very likely that the initial idea description will not be much more than a captive title and a short abstract. To allow for a detailed review and reduce the assessment risk, however, a full idea description that addresses all review criteria is needed. This is why an additional shaping activity is needed.

Shaping Class I ideas

With regard to organizing ideas, the activity of shaping ideas is handled differently for incremental (Class I) ideas vs radical (Class II and III) ideas. The shaping of incremental ideas usually takes one or two iterations with the idea generator itself in order to ‘fill in the gaps’ and prepare the idea for review, for which the assessment criteria are quantitative and very well defined. Shaping consists of documenting the idea (e.g., with drawings) or building up a good case against the evaluation criteria (e.g., what the costs and the benefits are, whether it is technically feasible, etc.).

Shaping Class II & III ideas

Shaping radical ideas – in order to turn them into concepts – takes more time, is more complex and needs the engagement of several people besides the idea generator. In most cases, radical concepts are the result of combining and building on several other ideas over time. These kinds of emergent processes are quite ‘fuzzy’ and organic, and not yet fully understood by social scientists, let alone applied by process designers. The current state-of-the-art in this domain is still at an experimental stage, and no real standards or best practices have been defined yet. Innovative, collaborative software companies are already implementing socio-cognitive features in collaborative innovation software, however, in order to leverage the social dynamics of communities, for instance, by integrating social science technology to connect people and knowledge in order to trigger ‘serendipitous’ events.

Idea Portfolio Management

Idea Portfolio Management is about creating and maintaining a well-balanced portfolio of ideas based on a number of different criteria such as the strategic innovation domain, innovation class, development time, investment, risk, etc. The main goal of idea portfolio management is to secure continuous output of ideas addressing short-term business improvements (doing things better) as well as long-term business opportunities (doing things differently).

Strategic innovation domains

The top-level ‘strategic’ differentiators of ideas are their innovation domains, which can be categorised into four main domains and ten sub-domains according to the model by Doblin:

| Innovation Category | Innovation Type | Description |
|---------------------|-----------------------|---|
| Finance | Business model | How you make money. |
| | Network and alliances | How you join forces with other companies for mutual benefit. |
| Process | Enabling process | How you support the company's core processes and workers. |
| | Core processes | How you create and add value to your offerings. |
| Offerings | Product performance | How you design your core offerings. |
| | Product system | How you link and/or provide a platform for multiple products. |
| | Service | How you provide value to customers and consumers beyond and around your products. |
| Delivery | Channel | How you get your offerings to the market. |
| | Brand | How you communicate your offerings. |
| | Customer experience | How your customers feel when they interact with your company and its offerings. |

Table 1 - Ten Types of Innovation (trade mark of Doblin, www.doblin.com/AboutInno/innotypes.html)

Innovation is not just about improving product performance, although it is still the domain in which most companies 'fight their battles'. Too few companies realise that there are many innovation opportunities besides the product performance domain. There are huge opportunities for innovations in the business model domain. Dell, for instance, became very successful in the finance category domain by making the customers pay for their PCs before assembly and shipment. Another well-known example in this domain is companies that changed their payment model from charging flat fees to offering free basic functionality with paid special services. Yet another example, this time in the product system domain, is bundling several applications into a single 'suite'.

Innovation Portfolio

Inside each of the ten strategic innovation domains, all four classes of innovation that were described earlier apply. This results in a 3D space that can be used to map all ideas, research projects, development projects and products or services in the innovation pipeline.

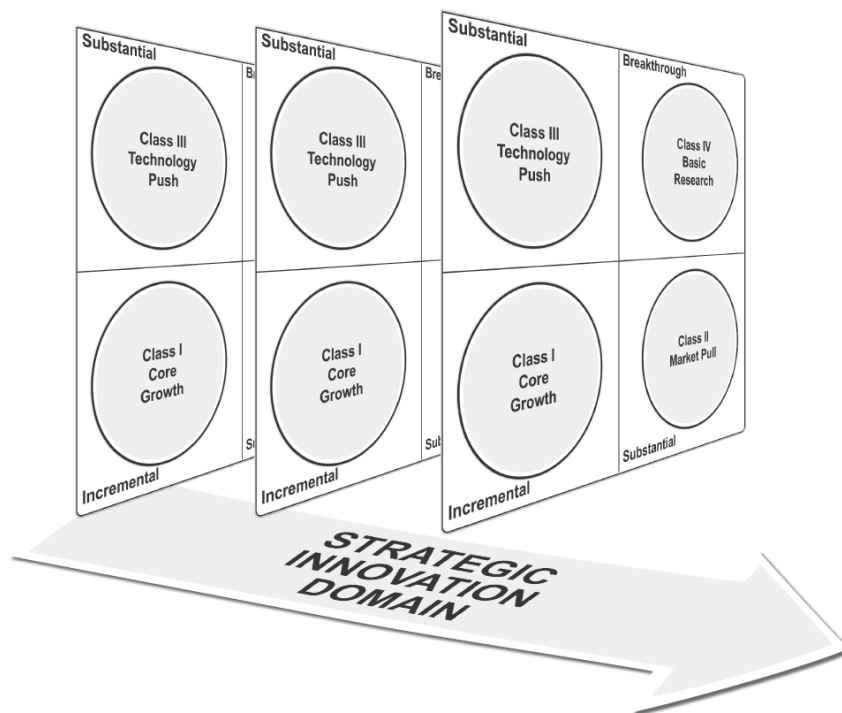


Figure 5 - Innovation portfolio

In order to obtain a well-balanced innovation portfolio, ideas should be harvested in all four main innovation categories (i.e., finance, process, offerings and delivery) and innovation classes I, II and III (i.e., core growth, market pull and technology push). A good balance does not mean that there has to be an equal distribution of ideas across all innovation categories and classes. This should not be an objective as it is practically unachievable. There will always be more Class I ideas than Class II and Class III ideas (which are harder to obtain), and most of them will be situated in the product performance domain (because this domain is directly related to your offering). It is important, however, not to neglect the other domains and to take the appropriate steps to harvest a substantial proportion of non-Class I product performance ideas. Targeting specific ideation campaigns in the other domains can do the trick.

Relations with other Practice Areas (*)

The other practice areas that are referred to here are covered in the book “The Art of Software Innovation”, available at www.springerlink.com.

Art of Openness

- *Balancing the quantity and quality of ideas:*

Opening up ideation to larger groups in order to increase the value, amount and success probability of ideas and concepts entering the development process

- *Capturing Ideas:*

The three levels of openness: closed ideation, semi-open ideation (selected partnerships) and open ideation (true Ideagoras)

Art of Focusing

- *Balancing the quantity and quality of ideas:*

It is crucial to give strategic guidance and focus to an innovation community through innovation targets.

- *Triggering ideas:*

One of the basic approaches to triggering ideas is to call for ideas through innovation challenges or idea campaigns (i.e., solicited ideation)

- *Idea Portfolio Management:*

Focused ideation campaigns to push an innovation community outside its comfort zone in order to harvest radical ideas (Classes II and III)

Art of Optimizing the Impact of Critical Resources

- *Eliminating screening bottlenecks:*

The scarcity of review resources – among other problems – can cause a bottleneck in the front-end ideation process.

Art of Idea Valuation

- *Minimizing assessment risks:*

Dealing with the high uncertainty at the front end to choose the right ideas or concepts for further development

Art of Innovation Stimulation

- *Triggering Ideas:*

Another approach to triggering ideas is to create an innovative culture that stimulates people to share their ideas spontaneously (i.e., unsolicited ideation)

Questions/Checklist

How can you find a good balance between the quantity and quality of ideas?

How can you avoid or eliminate screening bottlenecks?

How can you minimize the risks of idea assessment?

How should you provide effective inspiration and feedback channels in order to stimulate spontaneous ideation?

How can you create open, accessible, ubiquitous and diverse harvesting systems in order to capture ideas efficiently?

How can you filter, merge, rank and/or cluster all captured ideas in order to prepare them for further processing?

How can you organize and process ideas based on your specific innovation strategy and the expected outcomes?

How can you shape different types of ideas?

What are the top-level 'strategic' differentiators of ideas?

How can you distribute the ideas in the innovation portfolio across the different innovation categories and innovation classes?

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| | | |
|--|-------------------|---|
| A | | |
| Art of Focusing..... | 5, 16 | |
| B | | |
| B2C Ideagoras..... | 9 | |
| business opportunities..... | 14 | |
| C | | |
| Capturing Ideas..... | 7, 8, 13, 16 | |
| closed ideation..... | 8, 16 | |
| collaborative filtering..... | 6, 12, 13 | |
| collaborative idea management tools..... | 4 | |
| community behavioural data..... | 6 | |
| competition..... | 9 | |
| Competition-based Ideagoras..... | 9 | |
| create an innovative culture that stimulates people..... | 7 | |
| D | | |
| diversity of large user communities..... | 10 | |
| E | | |
| effective inspiration..... | 7 | |
| effective inspiration and feedback channels..... | 17 | |
| Efficient and transparent feedback channels..... | 8 | |
| eliminating screening bottlenecks..... | 4 | |
| F | | |
| feature requests..... | 4 | |
| feedback..... | 7, 8, 17 | |
| G | | |
| group decision support systems..... | 6 | |
| H | | |
| harvested ideas..... | 5 | |
| I | | |
| idea generation and creativity techniques..... | 4 | |
| idea harvesting..... | 4, 5, 7, 8, 9, 11 | |
| idea harvesting process..... | 7 | |
| idea management..... | 4, 6, 8 | |
| Idea management systems..... | 9 | |
| Idea Portfolio Management..... | 7, 16 | |
| Impact of Critical Resources..... | 5, 16 | |
| improve screening quality..... | 12 | |
| improving screening efficiency..... | 6 | |
| industry..... | 9 | |
| innovation classes..... | 15, 17 | |
| | | innovation culture..... 6, 7 |
| | | innovation domains..... 14 |
| | | innovation management..... 6 |
| | | innovation opportunities..... 12 |
| | | innovation portfolio..... 15, 17 |
| | | innovation process..... 4, 5 |
| | | issue tracking systems..... 4 |
| | | N |
| | | new business models..... 4 |
| | | new software features..... 4 |
| | | O |
| | | online innovation community..... 12 |
| | | online technology..... 4 |
| | | open ideation..... 5, 9, 16 |
| | | Organizing class I ideas..... 11 |
| | | P |
| | | product performance ideas..... 15 |
| | | R |
| | | radical ideas..... 5, 13, 16 |
| | | rich and valuable ideas..... 6 |
| | | S |
| | | screening algorithms based on explicit voting..... 12 |
| | | semi-open ideation..... 8, 16 |
| | | Shaping ideas..... 7 |
| | | social bookmarking to help users find ideas..... 8 |
| | | social media..... 12 |
| | | software builders..... 4 |
| | | standards..... 13 |
| | | storing ideas..... 4 |
| | | T |
| | | towards a more open, collaborative way of innovating..... 5 |
| | | Triggering Ideas..... 7, 16, 17 |
| | | True-market Ideagoras..... 9 |
| | | U |
| | | user involvement..... 4 |
| | | users vote and tag other ideas..... 8 |
| | | V |
| | | value of the ideas and concepts..... 12 |
| | | vote..... 8 |

| | | |
|---|--------------|---|
| W | Web 2.0..... | 6 |
|---|--------------|---|

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