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IDEA ASSESSMENT IN OPEN INNOVATION:

A STATE OF PRACTICE

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Abstract

Open innovation has become a fruitful approach to increasing the potential of innovation in organisations. Similar to traditional innovation, an open innovation approach can be characterised in three phases; namely idea generation, idea assessment and idea implementation/diffusion. While the academic community has begun to provide initial guidance for improving the various stages of the open innovation process, still little is known about how organisations currently assess ideas once they are collected. The potentially vast quantity of ideas collected through an open innovation approach has limited benefits to an organisation that is not able to categorise and assess ideas. Accordingly, in this study we carry out an exploratory survey among 331 managers to obtain a better understanding of idea assessment in practice. Our findings show, among others, that organisations investing in information systems for idea management have a higher satisfaction with the effectiveness of idea assessment, which is, in turn, associated with higher satisfaction with the innovation process overall.

Keywords: open innovation, user innovation, idea assessment, idea evaluation.

1 Introduction

Innovation is the bloodline of any organisation aiming to succeed in today's globalised economy. Hyper-competition and the fast spread of information force organisations to focus on their innovation efforts to be able to adapt and stay ahead of the evolving global market place (Schoonhoven et al., 1990). Traditionally, innovation was conducted in internal Research & Development (R&D) departments in organisations without any regard for external ideas (Lichtenthaler and Lichtenthaler, 2010). This closed approach to innovation, however, has over the years evolved into an open one in which ideas that are both internal and external to the organisation are considered valuable (Chesbrough, 2006).

Regardless of whether a specific innovation approach is open or closed, innovation is defined as a process through which ideas are transformed into new products, services or processes (Baregheh et al., 2009). It is typically seen as a three-step process that encompasses activities related to idea generation, idea conversion and idea diffusion (Hansen and Birkinshaw, 2007). In the first phase of the innovation process, organisations focus on creating a substantial set of ideas. The more ideas generated at this stage and the higher their quality, creativity, and applicability, the more chances the organisation has for successful innovation (Hansen and Birkinshaw, 2007). The ideas are then assessed in the second phase, with prioritised ideas converted into products or services, followed by activities increasing diffusion of the new product or service in the third phase. Accordingly, the success of an innovation process depends on how well the organisation is able to address each of the three phases.

While the traditional closed innovation approach is well understood in literature, further research is needed that guides how the three phases of the open innovation process can be improved (Pashkina and Indulska, 2011). Open innovation, which emerged as a paradigm only over the last decade, brings new challenges to the innovation process. It has a higher reliance on communication technology, the world wide web, social networks, and other technologies that connect organisations to external idea sources. This can potentially bring a broader and less specific set of inputs into the innovation process. Open innovation, therefore, calls for further research relating to the three underlying innovation phases. While the academic community has begun to respond to this gap in the body of open innovation knowledge, thus far mainly the idea generation phase received attention (Pashkina and Indulska, 2011; West and Bogers, 2011). However, while idea generation is critical, even with the best collection of ideas, an innovation process can still fail if the organisation does not have the appropriate idea assessment approaches in place.

In the context of open innovation, the issue of evaluating and integrating ideas has significant and different challenges than idea assessment in closed innovation approaches. In contrast to closed innovation, a successful open idea generation approach leaves organisations with the task to screen "hundreds of ideas generated by experts, employees, or consumers" (Toubia and Florès, 2007). The IBM Innovation Jam, for instance, generated 46,000 ideas, which needed to be screened for their relevance and feasibility (Bjelland and Wood, 2008). This process consisted of a multi-stage process involving a large group of volunteers that assisted in clustering and pre-selecting the ideas followed by a one-week review session with 50 senior executives and professionals. Blohm et al. (2011b) posit that constraints of time, budget, cognitive resources, and organisational structures limit an organisations absorptive capacity regarding such large amounts of ideas. According to Robinson and Schroeder (2009), it takes about \$500 and four hours of staff and management time to evaluate one idea in a Fortune 100 company. In summary, there is a clear need for new methods, mechanisms, and tools for efficient idea assessment in open innovation approaches (Blohm et al., 2011b; Dahan et al., 2010).

Accordingly, given these challenges, in this paper we focus our research efforts on the idea assessment aspect of the open innovation process. We choose this focus not only because of a clear gap in literature but also due to the reliance of this aspect of the process on supporting technology. The large number of ideas collected needs to be stored and categorised, which typically is done with the use of an information system (an idea management system) (Nilsson et al., 2002). Due to the lack of

empirical evidence in this area, this study aims to develop a better understanding of idea assessment practices currently in place in organisational open innovation processes, and aims to discover what information systems features and organisational approaches for idea assessment tend to be associated with higher levels of idea assessment satisfaction within an organisation.

We therefore undertake survey-based research that addresses the following research questions:

- What is the current practice of idea assessment in organisational open innovation?
 - Which information system features are positively associated with improved idea assessment?
 - What organisational approaches to idea assessment are associated with improved idea assessment?

We proceed as follows: Section 2 outlines related work relevant to the topic of idea assessment. Section 3 justifies the research methodology selected for this study. Section 4 provides the results of the survey of the current landscape of idea assessment practices in organisations, with a focus on the information system and other organisational features that have the potential to increase idea assessment success. Section 5 discusses the implications of the data analysis for research and practice. Finally, section 6 concludes the paper and gives an outlook to future work.

2 Related Work

Several literature reviews in the field point to the importance of understanding the determinants of successful open innovation by analysing the organizational capabilities and processes across firms (Greer and Lei, 2011; Lichtenthaler, 2011). West and Bogers (2011) conclude, based on their review of 280 open innovation research papers, that most research on inbound open innovation is concerned with obtaining external innovations rather than with the subsequent phases of the innovation process. This is surprising considering that organisations with an inherently limited absorptive capacity (Blohm et al., 2011b) have to process an increasingly large quantity of external input (Dahan et al., 2010; Toubia and Flores, 2007). Despite the clear need for a better understanding of best practice idea assessment in open innovation, only a scarcity of research addresses this topic. West and Bogers (2011) thus identify a broad research opportunity in analysing “what happens to innovations once they come into the firm” (West & Bogers, 2011) and highlight the need for studies that measure differences in how firms derive value from external innovations.

While there is a lack of research on idea assessment, several studies have begun to tackle this topic in the academic community. In particular, they focus on technology support for idea evaluation. Hrastinski et al. (2010), for example, analyse a sample of 51 innovation management systems and find that 84% of the utilised systems contain features that support organisations in idea evaluation. Riedl et al. (2009) perform an analysis of 25 public idea portals and identify several aspects that support the different phases of idea management. In compliance with most of the existing literature, they identify ‘ratings’ and ‘grouping and clustering’ as two mechanisms to support structured idea assessment.

From the perspective of research on idea rating, studies have focused on assessment criteria (Dean et al., 2006), rating scales (Riedl et al., 2010), and various algorithms (Salminen and Harmaakorpi, 2011; Toubia and Florès, 2007). Several studies explore the potential of prediction markets or idea markets as a form of implicit rating (Bothos et al., 2009; Dahan et al., 2010; Kamp and Koen, 2009; LaComb et al., 2007; Soukhoroukova et al., 2012). Blohm et al. (2011b) compare the performance of both mechanisms in terms of evaluation accuracy and satisfaction. Riedl et al. (2009), focusing on idea categorisation, recognise that clustering methods are particularly helpful to organise large idea portfolios. Research in this direction explores methods that are based on human and machine intelligence to tag, classify or otherwise aggregate the open innovation input in order to facilitate subsequent idea assessment. For example, the IBM Innovation Jam applied a combination of text mining software and human categorisation to cluster the vast pool of collected thoughts (Bjelland and Wood, 2008). In similar vein, a recent study has turned to developing frameworks for directly structuring ideas at the time of contribution (Kain et al., 2011).

3 Methodology

Due to the lack of empirical evidence on the current practice of idea assessment, our approach of choice is an exploratory survey conducted in an online setting. A survey approach allows us to feasibly gather a large number of responses from geographically distributed areas (Singleton et al., 2009) and also provides the flexibility required when the target participants are time-poor high level managers or C-level senior executives (e.g. CIO, CEO), as it is the case in this study.

In the following sub-sections we discuss the survey development process, the data collection and the subsequent approach for data analysis.

3.1 Survey Development

Due to the lack of prior empirical studies capturing the state of idea assessment in open innovation, our survey design relies on the limited existing literature combined with researcher input based on anecdotal evidence and consultation with academic open innovation experts (through a pilot survey). To develop the survey instrument, we design questions that address the core three areas highlighted in existing research (technology support for idea assessment, rating, and categorisation) and, in addition, incorporate questions relating to organisational aspects of idea assessment, as well as a variety of questions that aim to capture the success and effectiveness of idea assessment. Accordingly, in the exploratory spirit of the study, the survey instrument contains four distinct sets of questions as follows:

Demographic questions. Several questions capture the demographic landscape of our survey participants and the organisations they work for. Among others, we include questions relating to role and experience, the innovation budget of the organisation, organisation size and industry classification.

Information systems questions. We include a question relating to system functionality in order to explore the use of specific information system features for idea assessment. This also opens the ability to compare responses based on use, or lack of use, of information systems for idea management. We also include questions that explore obstacles that stand in the way of efficient idea assessment in an organisation, including IT-related issues.

Organisational aspect questions. We use categorical and ordinal scales to explore different organisational aspects of idea assessment. Mainly, the questions relate to the frequency of idea assessment, the percentage of ideas assessed, which criteria are used for assessment, how ideas are categorised and whether ratings are used.

Satisfaction and effectiveness questions. We rely on a 7-point Likert scale to measure the overall satisfaction with the innovation and assessment process. In addition, two questions specifically focus on the *effectiveness* of the idea assessment approach and the overall innovation process, respectively. Four questions are dedicated to capturing *satisfaction* levels with assessing the quality of the collected ideas, organising the collected ideas, categorising the collected ideas, and channelling the ideas to the relevant roles/areas within the company, respectively. An additional question measures the ability of the organisation to expose its employees to the collected ideas (measured by agreement Likert scale).

3.2 Data Collection

Given our focus on open innovation, we consider the well-informed target participants to be at the senior management and executive level in organisations. Accordingly, a survey broker was used to enable a more targeted approach to reach the relevant participants. Given the typically time-poor nature of such respondents, we chose to conduct a web-based survey that was easily accessible and available in any time/place situation. The survey was formatted in a way to also be accessible via mobile devices given the target audience. Overall 3241 participants were invited to respond to the survey. They were selected because of their senior and executive roles, as per the survey broker

database, within organisations with an operating base in Australia. At the close of the survey, which remained open for two weeks, 667 responses were collected, resulting in a response rate of 20.5%. From this number of responses, we eliminated 76 responses that were incomplete, then a further 211 responses because the respondents no longer held roles that were deemed to be informed about the overall innovation practice in the organisation (i.e. not senior or executive management roles). A further 49 responses were filtered out because they indicated that the organisation in question did not participate in open innovation. Following this filtering process we were left with 331 well-targeted responses. While the response rate is relatively low, the overall number of responses is significant for data analysis. The data is also closely aligned with the typical industry distribution of organisations (Australian Bureau of Statistics, 2011), thus providing a good basis for exploratory work. We posit that the response rate is low due to the target population that tends to be time-poor and hard to access in survey based research (Baruch, 1999).

3.3 Data Analysis Methodology

We use IBM SPSS Statistics (v19) to analyse the data. For categorical questions with nominal answers, we report the absolute and relative frequencies. Since absolute values are not meaningful for Likert scale data, we use these scales to compare different sub-groups based on the questions with a dichotomous or categorical scale (by forming two or more sub-groups for the comparison). Because Likert scales are ordinal, we use the non-parametric Mann-Whitney-Wilcoxon-U-Test (for two groups) and the Kruskal-Wallis-Test (for three or more groups). These tests are used to assess whether one of the two groups has significantly larger values than other groups within the data. The main test results are the mean rank (i.e. the mean position of the elements of one group in the ordered sequence of the population, and the test statistics U (Mann-Whitney-Wilcoxon) respectively Chi-Square (Kruskal-Wallis). These can be used to calculate the standard score Z and thus the p-value (significance level). These two non-parametric tests are similar to the T-Test or ANOVA for normally distributed data. However, given that a Kolmogorov-Smirnov-Test shows that our Likert scale data does not significantly follow a normal distribution ($p < 0.001$), we cannot apply the T-Test or ANOVA. Accordingly, we also report medians and quartiles rather than mean and variance.

4 Data Analysis

4.1 Demographic Data

The representative survey participant works in a for-profit organisation (75%) that has less than 100 employees (54%) with an average annual revenue of approximately \$5 million. This most typical participant tends to be at managerial level (74%) with an average of 10 years of relevant experience. CEOs represent 11% of our respondents. Other, less typical respondents, work for non-profits (10%) and government (15%), many in small companies with 10 or less (26%) or 11-100 (28%) employees. Close to 30% of these participants work in large organisations – 10% having between 1,001 and 5,001 employees and 17% over 5,000 employees. Given the variety of organisational sizes, it is not surprising that the annual revenue is also distributed from below \$1M (21%) to over \$10M (39%). The organisations operate in a variety of industries, with the most frequent being: Retail Trade (19%), Manufacturing (11%), Health and Community Services (10%), Education (9%), and Construction (7%). Other than manager, some respondents have positions as CEO (11%) or project manager (9%).

From the perspective of innovation, 72% of the survey participants are directly involved in innovation or improvement initiatives/projects within their company. The (total) annual innovation budget (including internal and external innovation) is widely spread with an average of \$150,000 per year. The results become more meaningful when considering the innovation budget in relation to the annual revenue. For 29% of organisations the innovation budget is less than 2.5% of the annual revenue, while 19% invest between 2.5% and 10% of their annual revenue in innovation. Only 7.3% of organisations have an innovation budget that is over 10% of their revenue.

4.2 Current Status of Idea Assessment

We approach the research question regarding the current practice of idea assessment in organisations by reporting the results of three categorical questions that allowed multiple choice responses. In these questions we aimed to explore whether the organisation uses specific criteria for idea assessment and, if so, which criteria are used, who is responsible for the assessment, how frequently ideas are assessed, what percentage of ideas is assessed, and whether information systems are used to facilitate idea management and assessment.

With regard to the use of specific assessment criteria (see Table 1), 33% of the organisations have no fixed criteria specified that guide the assessment process. The remainder of respondents rely on frequency of occurrence (29%), difficulty of implementation (31%), outcomes of a feasibility analysis (31%), or originality (18%) as criteria on which ideas are assessed. These percentages include organisations that use two (N = 55), three (36) or all four (9) criteria. In addition, six participants mentioned ‘cost’ as a criterion used in their organisation. Regarding the approach for idea assessment (Table 2), the data shows that 39% of the organisations do not have a structured or regular process for idea assessment. Only a minority has a dedicated person (14%) or a dedicated board of people (31%) who are in charge of evaluating the ideas.

Which criteria are used by the company to assess incoming ideas?

Frequency of occurrence	97	29%
Level of difficulty of implementation	103	31%
Feasibility analysis outcomes	102	31%
Originality	60	18%
None	110	33%

How is the assessment of ideas conducted in the company?

One dedicated person	45	14%
A dedicated board of people (e.g., a group of managers)	103	31%
There is no structured, regular process for idea assessment	128	39%
Ideas are collected but never assessed	8	2%
Unsure	72	22%

Table 1 & 2. Organisational aspects of idea assessment (multiple choices possible; absolute and relative values are displayed).

In terms of the frequency of idea assessment, almost 20% of organisations do not assess the ideas they collect at all (Table 5)¹, with a further 17.3% assessing ideas once a year or less frequently. Almost 24% of organisations assess their collected ideas every 6 months to 3 times a year, with the remainder of organisations varying between once a week (4.8%), 2-3 times per month (7.3%), once a month (19%) or once every 3 months (8.2%).

As shown in Table 3, only 20% (N = 68) of organisations manage their idea assessment practice supported by an information system, while over half (N = 184, 56%) do not use an idea management system, or any similar centralised support (e.g., a single Excel spread sheet) to manage idea assessment. 79 survey participants (24%) were unsure regarding this question and are thus excluded from IS-related analysis since the information value of their answers is limited. In the subsequent section, we explore whether there is a significant difference in the satisfaction with idea assessment between organisations that use an information system (idea management system) and those that do not. The many obstacles that are reported to stand in the way of efficient idea assessment in organisations are shown in Figure 1. It is clear that financial constraints are the most common hurdle for organisations – with 40% of the survey participants indicating cost of idea assessment being an issue. Lack of specific criteria for assessment was also an issue raised, among several others.

¹ There is a discrepancy in the responses regarding *never assessing* the collected ideas. When asking directly (Table 5), almost 20% confirm that the ideas are never assessed. We assume that in the general question (Table 2), these participants selected the unstructured process or unsure.

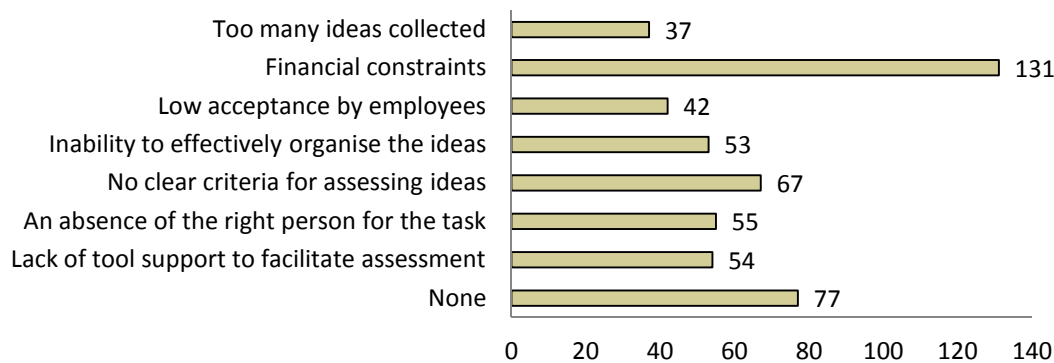


Figure 1. Obstacles standing in the way of efficient idea assessment by the company (multiple choices possible).

4.3 Factors Related to Perceived Effectiveness of Idea Assessment

4.3.1 Information System Features

In this section, we explore whether the availability of an idea management system in an organisation is positively associated with the perceived effectiveness of the idea assessment approach (see Table 3).

	Idea Mgmt. System	N		Idea Assessment Effectiveness							Mann-Whitney	
				1	2	3	4	5	6	7	Mean Rank	Statistics
Effectiveness of idea assessment approach	Yes	68	Frequency	-	2	3	<u>14</u>	25	<u>18</u>	6	171.32	U = 3208.5 Z = - 6.057 p < 0.001
			%	-	2.9	4.4	20.6	36.8	26.5	8.8		
	No	184	Frequency	20	<u>30</u>	24	44	<u>45</u>	18	3	109.94	
			%	10.9	16.3	13	23.9	24.5	9.8	1.6		

Table 3. Effectiveness of idea assessment approach. Scale from “very ineffective” (1) to “very effective” (7). The 79 respondents that were “unsure” about the idea management system are not included in the table. The quartiles (25%, 75%) are underlined. The median is bold.

The results indicate that the median effectiveness increases from 4 to 5 if an idea management system is used in the company. The quartiles also increase in a similar manner. The non-parametric Mann-Whitney-Test shows that these differences are significant ($p < 0.001$).²

Next, we analyse which features of idea management systems are associated with improved assessment effectiveness. The three features of “categorising of ideas” (available in $N = 75$ cases), “rating of ideas” ($N = 76$), and “frequency of occurrence” ($N = 46$) are considered. The results suggest that if the idea management system has at least one of these features, the effectiveness of the idea assessment approach (quartiles (4, 5, 5) for categorising; (4, 5, 5) for rating; (4, 5, 6) for frequency) are significantly higher than if none of these features are present ($N = 117$, (2, 4, 4)).

In addition to the effectiveness of the assessment approach, we also captured data regarding the participants’ satisfaction in regard to their ability to perform four aspects of idea assessment, namely, assessing quality, organising, categorising of the collected ideas, as well as channelling the ideas to the

² If included, the 79 “unsure” respondents would result to quartiles of (3, 4, 5) which is significantly lower than “yes” (Mann-Whitney $p < 0.001$) but not significantly different from “no” ($p = 0.912$). These results remain consistent for the other categories analysed in Table 4); thus many of the “unsure” participants might in fact not use a system after all.

relevant areas within the company. For all four aspects, the existence of an idea management system significantly ($p < 0.001$) improves the level of satisfaction; from a median of 4 to a median of 5 or 6 (see Table 4).

	Idea Mgmt. System	N	Satisfaction Rating								Mann-Whitney	
			1	2	3	4	5	6	7	Mean Rank	Statistics	
Assess the quality of the ideas collected	Yes	68	Frequency	-	2	2	<u>14</u>	14	23	13	171.13	U = 3221.0 Z = - 6.029 p < 0.001
			%	-	2.9	2.9	20.6	20.6	33.8	19.1		
	No	184	Frequency	15	24	<u>18</u>	51	<u>44</u>	27	5	110.01	
			%	8.2	13.0	9.8	27.7	23.9	14.7	2.7		
Organise the collected ideas	Yes	68	Frequency	1	-	3	12	22	<u>18</u>	13	174.10	U = 3019.5 Z = - 6.445 p < 0.001
			%	1.5	-	2.9	17.6	32.4	26.5	19.1		
	No	184	Frequency	15	27	<u>17</u>	50	<u>49</u>	24	2	108.91	
			%	8.2	14.7	9.2	27.2	26.6	13.0	1.1		
Categorise the collected ideas	Yes	68	Frequency	-	1	3	<u>17</u>	15	<u>19</u>	13	172.18	U = 3150 Z = - 6.177 p < 0.001
			%	-	1.5	4.4	25.0	22.1	27.9	19.1		
	No	184	Frequency	16	25	<u>21</u>	53	<u>45</u>	21	3	109.62	
			%	8.7	13.6	11.4	28.8	24.5	11.4	1.6		
Channel ideas to relevant areas in company	Yes	68	Frequency	-	1	7	8	<u>14</u>	21	<u>17</u>	168.15	U = 3424 Z = - 5.615 p < 0.001
			%	-	1.5	10.3	11.8	20.6	30.9	25.0		
	No	184	Frequency	12	23	<u>17</u>	47	<u>47</u>	30	8	111.11	
			%	6.5	12.5	9.2	25.5	25.5	16.3	4.3		

Table 4. Satisfaction with capabilities of the company. Scale from “very dissatisfied” (1) to “very satisfied” (7). The 79 respondents that were “unsure” about the idea management system are not included in the table. The quartiles (25%, 75%) are underlined. The median is bold.

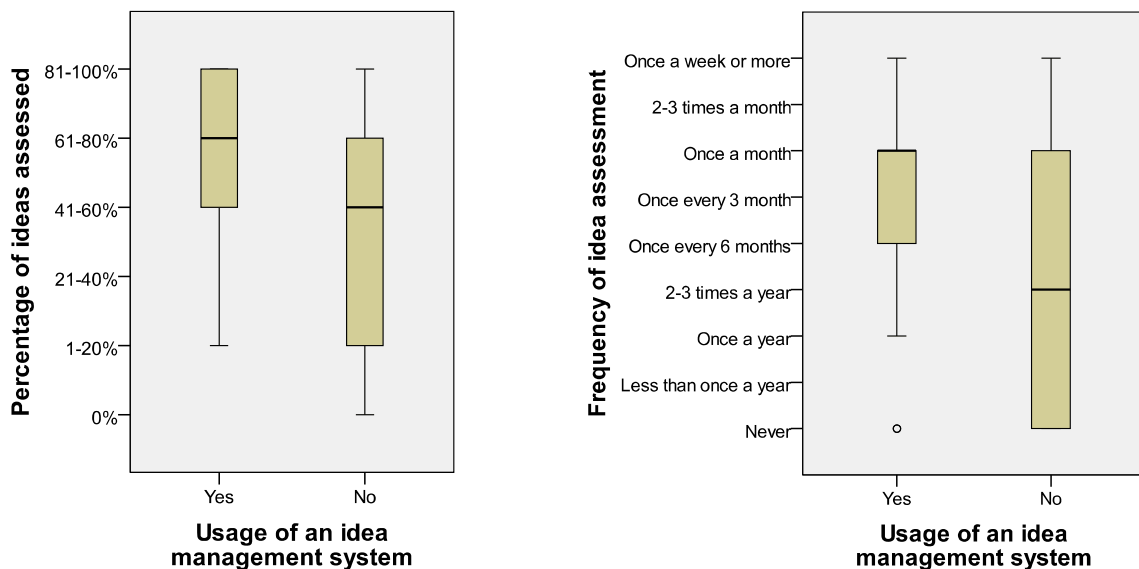


Figure 2 & 3. Influence of idea management system on percentage and frequency of idea assessment.

The existence of an idea management system also has an influence on the two objective measures of how often and how many ideas are assessed (see Figure 2 & 3). The median of the percentage of ideas assessed significantly improves from “41-60%” to “61-80%” ($U = 4318.5$, $Z = -3.845$, $p < 0.001$) if an idea management system is used by the organisation. The median of the frequency of idea assessment also significantly improves from “2-3 times a year” to “once a month” ($U = 3414.5$, $Z = -5.595$, $p = 0.000$) if an idea management system is in place.

4.3.2 Other Organisational Factors

In this section, we evaluate which organisational factors have a positive association with effectiveness of and satisfaction with idea assessment. The first set of questions regard the frequency of idea assessment (Table 5). Our data shows that 28% of the organisations represented by our survey respondents never assess the quality of incoming ideas, or do so less than once a year. 31% perform this evaluation at least once a month; while the rest does so less often. The results also indicate that this frequency has a clear and significant association with all effectiveness and satisfaction metrics, three of which are exemplified in Table 5.

Frequency of idea assessment	N	%	Effectiveness of idea assessment		Expose employees to ideas		Channel ideas to areas in company	
			Median	Mean Rank	Median	Mean Rank	Median	Mean Rank
Never	66	19.9	3	103.45	4	107.57	4	110.70
Less than once a year	27	8.2	3	84.26	4	114.13	4	93.11
Once a year	30	9.1	3.5	139.82	4	160.47	5	151.32
2-3 times a year	36	10.9	4	152.28	4.5	166.83	5	153.94
Once every 6 months	42	12.7	4	172.89	4	157.49	4.5	163.06
Once every 3 months	27	8.2	5	215.04	5	185.59	5	206.15
Once a month	63	19.0	5	223.82	5	212.13	5	215.46
2-3 times a month	24	7.3	5	221.06	6	224.38	6	229.63
Once a week or more	16	4.8	5	230.81	6	223.16	6	221.56
Total	331	100	Chi-Square: 100.578 df = 8; p < 0.001		Chi-Square: 66.395 df = 8; p < 0.001		Chi-Square: 79.762 df = 8; p < 0.001	

Table 5. *On the left: Frequency of idea assessment in absolute and relative values. On the right: Effectiveness/satisfaction relative to the frequency of idea assessment. Differences tested with the Kruskal-Wallis-Test.*

For example, the satisfaction with channelling the ideas to appropriate areas within the company increases from a median of 4 to a median of 6 if ideas are evaluated more often. Similarly, the effectiveness of idea assessment is improved when frequency of idea assessment is increased.

A similar pattern is uncovered if we consider the percentage of ideas assessed by organisations (the following results not shown in a table or graph for space limitations). Twenty-eight per cent of our respondents indicate that only 20% or less of the submitted ideas are assessed in their organisation. Fourteen per cent indicate that between 21% and 40% of submitted ideas are assessed, with nineteen per cent indicating that between 61% and 80% are assessed, and a further nineteen per cent assessing 81% of the ideas or more. This percentage of assessed ideas has a clear association with the satisfaction and assessment metrics. Consistently, the more ideas are assessed, the higher the satisfaction. For example, when considering satisfaction with exposing employees to ideas, the median steadily increases from 2 to 6.

5 Discussion

The explorative results of our quantitative study have several implications for research and practice. As a prelude to this discussion, we first put idea assessment in the perspective of the overall innovation process. To do so, in our study we also measure the *overall effectiveness of the innovation process* (including idea generation and implementation). Our data indicates that this value is significantly correlated with the *effectiveness of idea assessment* (Kendall-Tau correlation coefficient $\tau = 0.668$, $p < 0.001$), suggesting that idea assessment is a very important phase of the innovation process. Thus, identification of any practices or tools/functionality that help improve effectiveness of idea assessment is also likely to improve the overall effectiveness of the innovation process.

All additional findings from our study presented in this section are highly significant with at least $p = 0.001$. However, because of the explorative nature of our study, these findings require further study.

5.1 Need for Information Systems in the Innovation Process

Many idea management systems for various target groups exist and offer different features – e.g., idea submission and evaluation (Hrastinski et al., 2010). Surprisingly, however, only 20% of the respondents in our study are aware that their company uses some form of an idea management system. While many organisations without such a system may not see the lack as an obstacle, our data consistently outlines the benefits of technical support of the idea assessment process. Organisations using an information system are more effective in innovation overall and more satisfied with aspects such as organising, categorising, assessing, and implementing the collected ideas. They are also able to assess a higher quantity of the collected ideas in a much higher frequency.

Future work could investigate this discrepancy between clear benefits of using an information system and the lack of adoption of these systems within organisations and therefore improve the understanding for diffusion of these systems. More focus should also be directed to the utility of complex systems that have high theoretical value but are impractical because of high cognitive load (Blohm et al., 2011b) or financial constraints. Interestingly, having ‘*too many collected ideas*’ – a common problem reported in literature (e.g. Toubia and Florès, 2007) – is only encountered by a minority of our survey participants. Even if collective intelligence or crowdsourcing platforms are used, channelling these ideas to relevant areas in the company still relies on internal processes. Our survey results suggest that information systems can help with this process.

5.2 Organisational Factors and Idea Assessment

Our data shows that almost 40% of the participants’ organisations do not have a regular, structured process for idea assessment. These companies assess fewer ideas less frequently, leading to lower effectiveness. Alarming, almost 20% of organisations do not assess the ideas they collect at all. Besides a lack of time, some companies might see open innovation as a mere marketing instrument with the primary goal of engaging users in discussions about the brand; and thus the actual idea output is secondary. The reliance on one dedicated person for idea assessment, or a dedicated board of people, seems to be primarily moderated by the number of employees in the company (with the data showing no differences in satisfaction between these two approaches). Future research should investigate this aspect more closely, also taking into account different manager types, e.g. those rather looking for incremental ideas or breakthrough ideas (Vandenbosch et al., 2006).

While detailed literature exists regarding dimensions of idea quality (Blohm et al., 2011a; Dean et al., 2006), one third of our survey respondents report not having fixed assessment criteria, while only a third uses one criterion (equally distributed between frequency, difficulty, feasibility, and originality). Existing literature, however, indicates that complex rating scales are more efficient than simple scales (Riedl et al., 2010). Thus, the question remains which of the different dimensions is best suited in which cases, especially if financial or other constraints persist. Financial constraints are mentioned

most frequently as an obstacle to effective idea assessment, but the acknowledgement of this obstacle does not lead to significantly lower satisfaction metrics. However, if these financial constraints lead to not having the right person available, or not being able to utilise an appropriate tool for idea assessment, and thus being unable to organise the ideas, satisfaction and effectiveness of the assessment process are reduced because fewer ideas can be properly assessed.

6 Conclusion

This paper contributes to the discussion of the current state of practice of idea assessment in open innovation initiatives. Based on 331 survey responses, the study explores what practices organisations currently employ in their efforts to evaluate incoming ideas and, specifically, what role information systems play in idea assessment. Our study finds that organisations using idea management systems – information systems dedicated to improving the practice of managing incoming ideas – are overall more satisfied with idea assessment, and, furthermore, more satisfied with their open innovation initiatives as a whole. When considering other organisational factors, perhaps not surprisingly, the study also indicates that more frequent idea assessment is associated with higher satisfaction levels for the diffusion of ideas through the organisation. Similarly, organisations that have practices in place that allow a higher percentage of incoming ideas to be assessed have a higher level of satisfaction with idea assessment and with the overall innovation process. So overall, the data clearly states the benefits of having a regular and structured idea assessment process supported by IT.

While the study presents the first empirical snapshot of idea assessment in practice, it is not without limitations. One limitation of our work is that the survey did not control for other possible alternative explanations, hence, some of our findings might be due to mere correlation rather than causal effects. However, the results are a good basis on which to test many hypotheses in a more rigorous positivist matter. Another limitation stems from the target participants – the survey was only targeted at Australian corporations and the response rate was low, hence external reliability can be limited. However, the demographics of respondents indicate a good mix of executives from small and big companies, leading us to believe that the results will be similar in Western countries with similar corporate structures. In addition, given the exploratory nature of the study based on limited existing literature, question and measure development is a limitation of this work. Last, due to the limited survey length, we were also not able to go into much detail regarding many technical aspects of the idea evaluation process or how technology support is utilised in different aspects of idea assessment, the full assessment scales used, or the relation between internal and external evaluation (while we focus on open innovation only, we did not make a distinction between assessment of internal and external ideas). Many of these aspects could be better measured in semi-structured interviews rather than a quantitative survey. Future work could leverage the potential of a mixed methods approach that also employs qualitative instruments to generate additional insights that will further help increase our understanding of the phenomenon studied in this paper.

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