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A literature review of idea management

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Abstract
The objective of the paper is primarily to conduct a state-of-the-art literature review of Idea Management and secondary to point out unanswered questions which are left behind in the reviewed literature. Scientific knowledge is primarily represented in innovation management literature but also considerably in literature on software and IT. On the background of the literature review, there are some weaknesses in the literature to be considered. These weaknesses concern the understanding of how people interact with idea management in their daily work practices and how different types of ideas are included or excluded in the idea management processes.

Keywords: Literature review, idea management, idea management systems, front end innovation

Introduction

In academic literature front end innovation has in the last decade been given more and more attention as an area with a potential for increasing innovation capability. A line in this literature suggests exploiting this potential through the concept of idea management. Ideas are the potential starting point for any innovation venture and by understanding and supporting idea processes in front end innovation companies can strengthen their innovative capability. The paper aims to identify and review current literature dealing with idea management. Idea management has ancestors like the suggestion box and cousins like the ideation process but in this paper idea management will refer to the management of the process of motivating, generating, evaluating and implementing ideas on an organisational level in the context of front end innovation.

Method

Idea management is naturally related to a context of certain literature which forms a background but also intersections to the literature of idea management. This is literature which deals with innovation, front end innovation, ideation and creativity, typically with a management or engineering design perspective. The paper reviews literature which explicitly uses the term of idea management. Literature are found through a search in a wide range of scientific databases using the keyword "idea management" appearing anywhere in the text. The literature has been found through access to multiple databases within all fields of science. The search has resulted in more than one and a half hundred hits which include journal papers, conference proceedings, book chapters, magazines and newsletters, and identical literature. The first selection was to eliminate identical literature, and the second selection qualified twenty nine journal papers and conference proceedings. Some publications were untraceable

and therefore did not qualify neither did articles from magazines and newsletters. As a result of insight into this idea management literature, it can be thought of as dealing with the management of ideas in two perspectives, a behavioural and a structural perspective. The behavioural perspective is focused on understanding cognition, creativity, social capital in managing idea processes and the structural perspective is focused on systems and designs for managing ideas. The structural and behavioural perspective can be placed on a continuum line, one in each extreme, and literature on idea management can be placed somewhere on this line depending on how much effort used on either extreme or both. The perspective is relevant because idea management is strongly related to the use of systems for capture, sharing, store and retrieving ideas, still being a complex social human process in interaction with technologies. With this perspective view in mind the following section will review the identified literature on idea management.

Review

Identified and selected literature has been placed in a table and on the suggested continuum line. The placement on the continuum line is the result of a qualitative and rather explorative analysis of the literature and serves as a way to have a sense of the focus in the literature and to map the literature against each other. A short review of the literature will now be conducted with the continuum in mind but independent of this perspective. The review is qualitative but seeks to be true to the terms of the literature. Further on, in the discussion section, a more critical view will be used in order to point out weaknesses and unanswered questions of the identified literature.

Table 1 Identified literature on a behavioural – structural continuum line

Ref.	Affiliation	Year	Author(s)	Title	
[21]	*Academy of Management Proceedings & Membership Directory*	2002	Saatcioglu	Using grounded inquiry to explore idea management for innovativeness	**Behavioural ☒**
[26]	*Journal of Management Studies*	2006	Vandenbosch et al.	Idea management: A systemic view	
[15]	*International Conference on Engineering Design*	2011	Gish	Experiences with idea promoting initiatives	
[10]	*Conference on Human Factors in Computing Systems*	2008	Coughlan & Johnson	Idea management in creative lives	
[23]	*Creativity and Innovation Management*	2011	Selart & Johansen	Understanding the Role of Value-Focused Thinking in Idea Management	
[22]	*International Journal of Product Development*	2010	Sandström & Björk	Idea management systems for a changing innovation landscape	
[1]	*Conference on Human Factors in Computing Systems*	2010	Bailey & Horvitz	What's Your Idea? A Case Study of a Grassroots Innovation Pipeline within a Large Software Company	
[2]	*Creativity and Innovation Management*	2006	Bakker et al.	Creativity (Ideas) Management in Industrial R&D Organizations: A Crea-Political Process Model and an Empirical Illustration of Corus RD&T	

[25]	*R&D Management*	2002	van Dijk & van den Ende	Suggestion systems: transferring employee creativity into practicable ideas
[4]	*Journal of Product Innovation Management*	2009	Björk & Magnusson	Where Do Good Innovation Ideas Come From? Exploring the Influence of Network Connectivity on Innovation Idea Quality
[16]	*Human Systems Management*	1983	Green et al.	Idea management in R-and-D as a Human Information-Processing Analog
[14]	*Organizational dynamics*	1983	Galbraith	Designing the Innovating Organization
[3]	*Journal of Product Innovation Management*	2009	Barczak et al.	PERSPECTIVE: Trends and Drivers of Success in NPD Practices: Results of the 2003 PDMA Best Practices Study
[5]	*Creativity and Innovation Management*	2004	Boeddrich	Ideas in the Workplace: A New Approach Towards Organizing the Fuzzy Front End of the Innovation Process
[20]	*Journal of Technology Management*	2002	Nilsson & Elg	Managing ideas for the development of new products
[13]	*International Journal of Innovation Management*	2003	Flynn et al.	Idea management for organisational innovation
[9]	*International Journal of Technology, Policy and Management*	2007	Brem & Voigt	Innovation management in emerging technology ventures -the concept of an integrated idea management
[11]	*R&D Management*	2009	Enkel et al.	Open R&D and open innovation: exploring the phenomenon
[18]	*Annual Hawaii International Conference on System Sciences*	2010	Hrastinski et al.	A review of technologies for open innovation: Characteristics and future trends
[8]	*Technovation*	2009	Brem & Voigt	Integration of market pull and technology push in the corporate front end and innovation management -Insights from the German software industry
[24]	*Human Factors and Ergonomics in Manufacturing*	2009	Tung et al.	A custom collaboration service system for idea management of mobile phone design
[29]	*Journal of Software*	2010	Xie & Zhang	Idea Management System for Team Creation
[28]	*Communications in Computer and Information Science*	2010	Westerski et al.	A model for integration and interlinking of idea management systems
[27]	*International Journal of Web Based Communities*	2011	Westerski et al.	The road from community ideas to organisational innovation: A life cycle survey of idea management systems
[17]	*Conference on Human Factors in Computing Systems*	2011	Holtzblatt & Tierney	Measuring the effectiveness of social media on an innovation process

[7]	*International Conference on Internet and Web Applications and Services*	2008	Bothos et al.	A collaborative information aggregation system for idea management
[6]	*Expert Systems with Applications*	2012	Bothos et al.	Collective intelligence with web-based information aggregation markets: The role of market facilitation in idea management
[19]	*Annual Hawaii International Conference on System Sciences*	2011	Moos et al.	The role of innovation governance and knowledge management for innovation success
[12]	*International Journal of Innovation and Learning*	2009	Fatur & Likar	The development of a performance measurement methodology for idea management

In an earlier contribution on the subject of idea management, Green et al. (1983) analyses the management of the flow of ideas in an R&D laboratory in a human information-processing perspective. Here the authors use the understanding of human information-processing as an analog, for example how the human brain processes information, synthesises, remembers, recalls etc. They presents a logic with human information-processing on the one side and organisational information-processes on the other side, equally contributing to the flow of ideas in industrial R&D. Managerial implications are identified, concerning the generating of ideas, capturing ideas, retaining ideas and retrieving ideas. It is interesting that this early study predicts the future of idea management and its strong connection to the use of computer technology as an analog to the human brain. This study was before the burst of the information technology and one could only imagine how IT would take part in the work practices as idea processes and management. The analog is interesting and when brain mechanisms are placed outside the head of people on an organisational level, interesting issues will occur in idea process practices. In a contribution at the same time, Galbraith [14] suggests a certain design of the organisation where innovation ideas, more specific radical innovation ideas, have better conditions. The term of idea management is used on a more individual level as a cognitive and social process and concerns how ideas are developed and promoted through bargaining and negotiating in the organisation.

Idea management literature is primarily based in the field of innovation management in organisations and as a part of the above described development of information technology, idea management is also represented and developed in information technology literature dealing with applications of idea management systems. As an example, an idea management system for team creation system is developed by Xie & Zhang [29]. They seek to understand the process of team creation and develop a software tool to support and enhance the process. In general, the idea process of the team creation is duplicated in the tool and made manageable through the main steps of idea recognition, idea selection, idea evaluation, and idea visualisation. The work of Westerski et al. [27] deals with the development of idea management systems and furthers it. From being nothing more than a box where employees could submit their ideas on a piece of paper, the web 2.0 techniques allow complex submission of data and data handling in idea management systems. The work of Westerski et al. [28] suggests the use of semantic web principles to link organisational systems for better idea assessments.

Studies of idea management most often imply an IT system for the sharing and storage of ideas in innovation management literature. Even on a global level both within an organisation and crossing the boundaries of the organisation. Brem & Voigt [9] suggest the integration of an idea management system where internal idea management is integrated with external

groups like suppliers, costumers, competitors, and other stakeholders which will improve the chances of successful innovations. The idea management system can also be a sharing point between users, market and organisations [24] and thereby also work as an instrument for handling open innovation [11]. Work by Bothos et al. [6], [7] shows how idea management can even be placed outside the organisation and be performed through virtual markets where professionals and users evaluates and selects ideas to be implemented into the organisations development pipe-line. Furthermore, Holtzblatt & Tierney [17] investigates how social media can influence the innovation process. Hrastinski et al. [18] reviews technologies used for open innovation where one is idea management and points to certain implications in designing these systems as increased customisation, attracting innovators, handling information overflow, and supporting the creative front end of innovation. The last implication is elaborated and it is suggested that IT systems do not yet support the idea processes in the earliest stages.

Innovation literature particularly deals with front end innovation in a managerial perspective and common for the fields which deals with idea management is recognition of a creative ideation process which can be managed in order to reduce uncertainty in the front end of innovation and give stronger links to the innovation process of an organisation and thereby increase innovation capability. In the work of Saatcioglu [21] and Vandenbosch et al. [26], ideas are viewed as movement and change, cognition and knowledge, and social interaction. The management process is viewed as recognising the need for ideas, idea generation and evaluation. This process is, with variations as seen in the latter, very common and agreed upon in the literature on idea management. In this particular study, Saatcioglu [21] and Vandenbosch et al. [26] shows how the idea management process can be approached in different ways by certain manager archetypes found in the study. In this study the focus is on the managers and how their personality types influences the management of ideas and it is pointed out that this understanding can support the way idea processes are managed and thereby the performance of management in general. In this study an IT system is not explicit and there is an understanding in the literature that human idea management can exist on its own but an IT idea management system cannot. As a consequence the aim with idea management systems is to facilitate and support human idea management to lift innovation capability to a higher level of performance [19], [12].

Nilsson & Elg [20] investigates idea management systems and proposes certain considerations to ensure successful implementation in order to increase innovation capability. The considerations are the purpose of the system, the role of information technology, the role of the submitter in realising his/her idea and the way in which ideas are transformed to the product development process. van Dijk & van den Ende [25] considers organisational related factors for managing creativity in order to transform creativity into practicable ideas as divided into structural and cultural. Cultural factors considers factors like management support, willingness for change and a clear strategy where structural factors considers evaluation and reward procedures and allocation of means for idea work. A proposed model is comprised of three phases, idea extraction based in the cultural factors, idea landing based in both cultural and structural factors, and idea follow-up based in structural factors. Flynn et al. [13] views the idea generation process based on innovation theory as being types of innovations, innovation as a process, and the innovation process closely related to ideas and creativity as a human resource, a process, and cultural. Flynn et al. [13] proposes the idea creation methodology and the innovation funnel together with a software tool to support the managerial process of idea creation and innovation. Boeddrich [5] proposes a set of general and specific requirements of idea management on the background of innovation models of organising the fuzzy front end of innovation and draws on a case study of computer-aided idea management. Brem & Voigt

[8] builds upon a range of idea and innovation management models and frameworks and suggests an advanced framework of a front end innovation approach for an innovation strategy in a frame of an integration of market pull and technology push mechanisms. Bakker et al. [2] adds a political process aspect to the understanding of idea management on the background of viewing creativity in relation to the organisation. Using the proposed model of the Crea-political process, an empirical study of an idea management software tool is conducted.

There is a shared understanding in the literature of idea management of innovation as depending on employee cognition, creativity, and social interaction. The literature on idea management is closely related to literature on ideation where social interaction, creativity and decision making are essential topics. Caughlan & Johnson [10] investigates idea management processes on an individual and social level where capture, representation and development of ideas are essential processes. Bailey & Horvitz [1] investigates grass root innovation pipelines within a company and how these can be structured and supported through idea management. Selart & Johansen [23] builds on a notion of creative thinking as being alternative-focused or being value-focused which results in more or less number of ideas and of more or less quality. In their study, the amount of ideas did not relate to the quality of ideas which has implications for idea management systems. They conclude that value-focused thinking has more potential for creating quality ideas which has implications for how ideas are evaluated in idea management systems. Sandström & Björk [22] investigates the implementation of idea management systems and points out the managerial implications of informal idea processes and types of ideas acceptable for the idea management system. In another work of Björk & Magnusson [4], they investigate the relationship between individual and group network connectivity and innovation idea quality based on a study of the data in an IT idea management system. It is recommended that social networks need managerial support while it is an open question whether social networks and ideation processes should be formalised or not. In the work of Gish [15], idea promoting initiatives are examined in a company, how they are designed and how they are used in practice in idea work. In a discussion it is argued that an idea management systems design not matching the practices of idea processes in the organisation may have difficulties in being integrated in the organisation but at the same time a system which matches the practices may not challenge practices in order to increase innovation capability. The managerial implication of the study is the interplay between the explicit processes and system and the daily practices of idea work. The formalisation of idea processes should not be solely in focus but the way to facilitate practices and challenge them. Gish [15] finish the contribution by encouraging managers who implements idea promoting initiatives to be aware of and understand the design and intent of the system on the one hand and the daily practices of the organisation on the other hand. In a best practices study by Barczak et al. [3] they conclude that the results concerning idea management in the front end of innovation are ambiguous but agreed as an area in need of improved management.

Conclusion

The review shows that idea management knowledge is represented in innovation management literature but also in IT literature. Idea management literature primarily deals with best practice case studies and supplies a variety of frameworks, models and systems for manoeuvring the stream of ideas in front end innovation. Recent literature has begun to investigate how idea management systems are integrated in the practices of idea processes in organisations and identify certain managerial implications. There is an emphasis on both human behaviour and the systems structure in managing ideas but the interplay between the two and which managerial implications becomes relevant is still an area to be uncovered in depth. The review leaves behind uncertainty if the idea management systems will live up their promises of in-

creasing innovation capability. Especially two unanswered questions is left behind; how are ideas viewed in the process of idea management - are they viewed as an entity which has gained enough structure and momentum to be submitted to the idea management system or are ideas viewed as mouldable, fragile and depending on social and political interactions like bargaining and negotiating to move ideas forward? And how are radical and incremental innovation differentiated and how does this influence the process of idea management? The reviewed literature points to the importance of considering informal idea processes in integrating idea management systems in organisations but not much research is conducted on how people interact with idea management systems in their daily work practices and which managerial implications this brings. The literature also points to the difference in idea processes considering radical against incremental innovation but the issue is largely left behind when considering idea management. In the literature these issues are pointed at but not dealt with in depth.

References

[1] Bailey, B.P. & Horvitz, E., "What's Your Idea? A Case Study of a Grassroots Innovation Pipeline within a Large Software Company", *CHI2010: PROCEEDINGS OF THE 28TH ANNUAL CHI CONFERENCE ON HUMAN FACTORS IN COMPUTING SYSTEMS, VOLS 1-4*, , pp. 2065-2074, 2010

[2] Bakker, H., Boersma, K. & Oreel, S., "Creativity (Ideas) Management in Industrial R&D Organizations: A Crea-Political Process Model and an Empirical Illustration of Corus RD&T", *Creativity and Innovation Management*, vol. 15, no. 3, pp. 296-309, 2006

[3] Barczak, G., Griffin, A. & Kahn, K.B., "PERSPECTIVE: Trends and Drivers of Suc- cess in NPD Practices: Results of the 2003 PDMA Best Practices Study", *Journal of Product Innovation Management*, vol. 26, no. 1, pp. 3-23, 2009

[4] Björk, J. & Magnusson, M., "Where Do Good Innovation Ideas Come From? Explor- ing the Influence of Network Connectivity on Innovation Idea Quality", *Journal of Product Innovation Management*, vol. 26, no. 6, pp. 662-670, 2009

[5] Boeddrich, H., "Ideas in the Workplace: A New Approach Towards Organizing the Fuzzy Front End of the Innovation Process", *Creativity and Innovation Management*, vol. 13, no. 4, pp. 274-285, 2004

[6] Bothos, E., Apostolou, D. & Mentzas, G., "Collective intelligence with web-based information aggregation markets: The role of market facilitation in idea management", *Expert Systems with Applications*, vol. 39, no. 1, pp. 1333-1345, 2012

[7] Bothos, E., Mentzas, G. & Apostolou, D., "A collaborative information aggregation system for idea management", *Proceedings - 3rd International Conference on Internet and Web Applications and Services, ICIW 2008*, pp. 289-296, 2008

[8] Brem, A. & Voigt, K., "Integration of market pull and technology push in the corporate front end and innovation management - Insights from the German software industry", *Technovation*, vol. 29, no. 5, pp. 351-367, 2009

[9] Brem, A. & Voigt, K., "Innovation management in emerging technology ventures - The concept of an integrated idea management", *International Journal of Technology, Policy and Management*, vol. 7, no. 3, pp. 304-321, 2007

[10] Coughlan, T. & Johnson, P., "Idea management in creative lives", *Conference on Human Factors in Computing Systems*, pp. 3081-3086, 2008

[11] Enkel, E., Gassmann, O. & Chesbrough, H., "Open R&D and open innovation: explor- ing the phenomenon", *R&D Management*, vol. 39, no. 4, pp. 311-316, 2009

[12] Fatur, P. & Likar, B., "The development of a performance measurement methodology for idea management", *International Journal of Innovation and Learning*, vol. 6, no. 4, pp. 422-437, 2009
[13] Flynn, M., Dooley, L. & O'Sullivan, D., "Idea management for organisational innova- tion", *International Journal of Innovation Management*, vol. 7, no. 4, 2003
[14] Galbraith, J.R., "Designing the Innovating Organization", *Organizational dynamics*, vol. 10, no. 3, 1982
[15] Gish, L., "EXPERIENCES WITH IDEA PROMOTING INITIATIVES", *Proceedings of the 18th International Conference on Engineering Design*, pp. 83-92, 2011
[16] Green, S.G., Bean, A.S. & Snavely, B.K., "IDEA MANAGEMENT IN R-AND-D AS A HUMAN INFORMATION-PROCESSING ANALOG", *Human Systems Management*, vol. 4, no. 2, pp. 98-112, 1983
[17] Holtzblatt, L. & Tierney, M.L., "Measuring the effectiveness of social media on an innovation process", *Conference on Human Factors in Computing Systems*, pp. 697- 712, 2011
[18] Hrastinski, S., Kviselius, N.Z., Ozan, H. & Edenius, M., "A review of technologies for open innovation: Characteristics and future trends", *Proceedings of the Annual Hawaii International Conference on System Sciences*, 2010
[19] Moos, B., Beimborn, D., Weitzel, T. & Wagner, H., "The role of innovation govern- ance and knowledge management for innovation success", *Proceedings of the Annual Hawaii International Conference on System Sciences*, 2011
[20] Nilsson, L. & Elg, M., "Managing ideas for the development of new products", *Inter- national Journal of Technology Management*, vol. 24, no. 5-6, pp. 498-513, 2002
[21] Saatcioglu, A., "Using grounded inquiry to explore idea management for innovative- ness", *Academy of Management Proceedings & Membership Directory*, 2002
[22] Sandström, C. & Björk, J., "Idea management systems for a changing innovation land- scape", *International Journal of Product Development*, vol. 11, no. 3, 2010
[23] Selart, M. & Johansen, S.T., "Understanding the Role of Value-Focused Thinking in Idea Management", *Creativity and Innovation Management*, vol. 20, no. 3, pp. 196- 206, 2011
[24] Tung, W., Yuan, S. & Tsai, J., "A custom collaboration service system for idea man- agement of mobile phone design", *Human Factors and Ergonomics in Manufacturing*, vol. 19, no. 5, pp. 494-509, 2009
[25] van Dijk, C. & van den Ende, J., "Suggestion systems: transferring employee creativ- ity into practicable ideas", *R&D Management*, vol. 32, no. 5, pp. 387-395, 2002
[26] Vandenbosch, B., Saatcioglu, A. & Fay, S., "Idea Management: A Systemic View link", *Journal of Management Studies*, vol. 43, no. 2, 2006
[27] Westerski, A., Iglesias, C.A. & Nagle, T., "The road from community ideas to organ- isational innovation: A life cycle survey of idea management systems", *International Journal of Web Based Communities*, vol. 7, no. 4, pp. 493-506, 2011
[28] Westerski, A., Iglesias, C.A. & Rico, F.T., "A model for integration and interlinking of idea management systems", *Communications in Computer and Information Sci- ence*, vol. 108 CCIS, pp. 183-194, 2010
[29] Xie, L. & Zhang, P., "Idea Management System for Team Creation", *Journal of Soft- ware*, vol. 5, no. 11, pp. 1187-1194, 2010