By Benoît Gailly, 20 May 2020

Appendix: Methodology

You will find here a detailed description of the Navigating Innovation project objectives and methodology, based on the paper presented at the 2020 ISPIM conference (June 7-10)

Abstract

We contribute to bridging the chasm between innovation management science and innovation management practices by developing a structured, illustrated and commented on online directory of key innovation management papers, targeted at innovation management practitioners, students and young researchers. A selection of more than 2300 relevant papers from 200 high-quality journals, from innovation management, entrepreneurship, strategy, general management, economics, social sciences and other disciplines has been developed and validated, and is available online. It is structured along five core organisational innovation management capabilities, 23 innovation management themes, 80 key managerial insights (which are outlined and illustrated) and 450 keywords. Those scientific references are completed with additional references to a selection of 150 videos and 280 books.

- **The chasm between innovation management practice and literature**

Since the seminal works of Argyris ans Schön, Arrow, Daft, Mowery and Rosenberg, Nelson & Winter, Ulrich, Utterback and Aberbathy, Van de Ven, and many others, the last decades have seen extensive research around the field of innovation management, with more than 4 million entries now available through search engines like Google Scholar. However, it remains a challenge for innovation managers (and innovation management students) to find their way in the resulting maze of journals, publications, theoretical fields and nomenclature.

There is therefore still a significant gap or "chasm" between on the one hand "rigor", -management science- and on the other hand "relevance" – management practices (Gopinath & Hoffman, 1995; Starkey & Madan, 2001; Starkey et al, 2009, Frank & Landström, 2016).

This is even more important in the context of an increasingly complex environment, where making the differences between a trend and a fad, between a best practice and a buzzword, or between what is generic and what is context-specific is more critical than ever.

Why there is a chasm

The scientific literature remains a reference in the field of innovation management, but navigating through that "knowledge system" (Kieser & Leiner, 2009) remains a challenge for many non-scholars, both in terms of sources (relevant journals) and search terms (keywords).

On the one hand, relevant references can come from a wide range of innovation-related (R&D, product development, creativity …) and general management-related (strategy, entrepreneurship,

organization…) journals (Raasch et al., 2013), as well as from various neighbouring disciplines (sociology, marketing, engineering, psychology, operations management… see Agarwal & Hoetker, 2007). Moreover, predatory (fake) or low quality journals often use titles that are similar to famous ones, and articles that have been retracted due to fraudulent data or methodologies are still widely accessible online. Finally, older but still relevant references might be discarded by traditional search algorithms.

On the other hand, picking the right concept or keyword to search for can also be a challenge. Innovation management issues can be addressed in the literature using specialized terms (such as "ambidexterity", "dynamic capabilities", "dominant design", "effectuation", "living labs", or "value curves"), or using different terms that might appear similar to the non-expert (such as "open innovation", "networking", "partnerships", "collaborations", "clusters", "alliances", "cooperation", …). They can also be addressed using terms which are not consistently defined (such as "start-ups", "technologies", "family business", "culture", "business models", "globalization", or "ecosystems") or using terms that have context-specific meaning (such as "frugal", "chasm", "disruptive", or "lean"). Finally, some popular terms, tools and canvas (such as "Blue Ocean", "lean start-ups, "hackathons" …) are not always given high visibility in the scientific literature.

In other words, we often do not know neither which needle to look for (which concepts or keywords), nor in which haystack (which sources or journals).

There is therefore a need for scholars to "provide, maintain, and update online, user-friendly, plain language summaries of the practice principles that the best available evidence supports, while sharing information regarding their effective use as well as their limitations" (Rousseau, 2007).

Building upon available resources

Multiple excellent books are aimed at addressing this problem, most famously the various editions of the reference books by Tidd, Bessant and colleagues. However, those books are difficult and costly to maintain up-to-date, and are sometimes not adapted to the needs of "digital natives". Moreover, those books are competing for visibility with a large number of well-marketed "follow-my-recipe-to-success" books, which are often long on promises but short on rigor.

Many scientific journals as well as reviews from famous business schools (HBR, etc…) are also available online, but often only on a restricted basis. Furthermore, as discussed above, they are sometimes difficult to navigate for those not familiar with their various editorial policies, epistemological perspectives and nomenclatures.

Finally, various websites and online communities of practices are also available (such as for example www.boardofinnovation.com), but as far as we know none of them is both transversal and focused on high-quality scientific publications.

Building upon previous scholarly initiatives (for example, www.innovation-portal.info), the goal of this project is therefore to develop and maintain an open, easy-to-navigate and up-to-date online access to a structured selection of key high-quality scientific articles regarding innovation management and its main challenges.

We hope therefore to contribute to fill the chasm between "rigor" – innovation management research and "relevance" – innovation management challenges.

- **Developing an online directory of relevant high-quality papers**

We will present below the approach used to build, structure and validate our online directory, building upon the methodology developed by Shane and Ulrich (2004).

Initial sample and structure

Our inventory of "key references" started with a systematic literature review completed as part of a PhD thesis (De Kort et al., 2017), updating the work of Crossan and Apaydin (2010). This led to a first list of 193 highly-cited articles on "organizational innovation" and "innovation", from a selection of leading management journals.

We then reviewed the titles and abstracts of the papers referenced by those 193 articles, in order to find new references, which were (i) linked to innovation management capabilities, (ii) highly cited and/or from highly ranked journals and (iii) including clear managerial implications (excluding purely theoretical or methodological papers).

The resulting list was then synthesized using a pragmatic and practice-oriented structure, derived from those provided by academic experts and consultants (Boly et al., 2014; Lawson & Samson, 2000; O'Connor, 2008; Romijn & Albaladejo, 2002; Rothaermel, & Hess, 2007; Smith et al., 2008).

This structure follows an "issue-tree" problem-solving approach. It starts with five core capabilities that organizations need to master in order to efficiently manage innovation. Its core is the entrepreneurial process involving the capabilities of "identify-select-implement" (Shane & Venkataraman, 2000). Around this core process, organizations must also have the capabilities to develop and leverage on the one hand an entrepreneurial ecosystem, and on the other hand a coherent strategic vision.

Each of those five core capabilities is then detailed at different levels of analysis. For example, the entrepreneurial ecosystem capability is considered from the point of view of (i) the individual corporate entrepreneurs/innovators, (ii) the start-up or innovation project teams, (iii) the culture and structure of the parent organization, (iv) innovation networks and (v) the socio-economic ecosystems.

For each of those levels of analysis, we then identified 3 to 5 synthesis "key insights", supported by a relevant and original illustration (a cartoon or a figure) and a selection of keywords.

Finally, we completed this "top-down" approach by a "keyword"-based search in leading management journals for each of the key insights. This "bottom-up" search is continuously updated by our faculty and by teams of management students attending our specialized track in innovation management.

Validation and adjustments

The resulting list of references was cross-validated in four ways.

First, we compared our list with the references and keywords provided in the latest edition of the reference book "Managing innovation" by Tidd and Bessant, and with the references mentioned in the teaching material delivered by several leading scholars (see tim.aom.org/teaching-resources), in order to spot missing key keywords and references.

Second, we compared our list of keywords with two list of keywords that were automatically generated using natural language processing software applied on databases of scientific papers, by the innovation consultant Creax. Using two databases of respectively 54316 and 15517 papers, they identified 70 different innovation "types" (for example "employee-driven", "reverse", or "organizational") and 40 different innovation "challenges" (for example "measuring innovation performance" or "licensing"). Again, we cross-checked those two lists with our own list of insights and keywords.

This validation process was pursued until we reached the equivalent of theoretical saturation (Eisenhardt, 1989, p.545), that is until no new sources, insights or keywords emerged.

Third, we reconciled the structure of our list (themes, sub-themes, etc) with the structure proposed by the International Organization of Standardization regarding innovation, in particular the ISO 56000 and ISO 56002 norms. We controlled that all the issues highlighted by those norms are covered in our structure, and we built a "conversion table" matching each of those issues to specific themes or subthemes in our list.

Fourth, we eliminated all potential remaining "low quality" references, based on journal ranking and citations. We only kept the references from journals ranked 4*, 4, 3 or 2 by the Association of Business Schools, or with a SJR Scopus h-index above 40. The resulting breakdown of journals and references is presented below (Table 1).

Table 1 Main journals and references per domain

Domain	References	Journals	Most frequently listed journals
General Management	1067	43	SMJ, HBR, OS, AMJ, MS, AMR, ASQ
Innovation & Entrepreneurship	917	30	RP, JBV, JPIM, Technovation, R&D M
Marketing, Finance, HR, Operations	148	61	IMkM, JoMk, VC, JCP, IJPM, RFS, MkS
Economics	123	33	NBER, AER, JEP, RES, JPE, QJE, RAND
Other social sciences	114	30	ICC, RS, App. Psy., AJSoc., J App. Soc.
Other	23	8	Science, Nature, PNAS
Total	2392	205	RP, SMJ, JBV, OS, HBR, JPIM, AMJ, MS

Innovation & Entrepreneurship	General Management	Other fields
Creativity and Innovation Management	Academy of Management Annals	American Economic Review
Creativity Research Journal	Academy of Management Journal	American Journal of Sociology
Entrepreneurship: Theory and Practice	Academy of Management Perspectives	Applied Psychology
Eur. Journal of Innovation Management	Academy of Management Review	Industrial and Corporate Change
Int. Journal of Technology Management	Administrative Science Quarterly	Industrial Marketing Management
Int. Journal of Innovation Management	California Management Review	Int. Journal of Project Management
International Small Business Journal	European Management Journal	Journal of Applied Psychology
Journal of Business Venturing	Harvard Business Review	Journal of Cleaner Production
Journal of Prod. Innovation Management	Int. Journal of Management Reviews	Journal of Economic Perspectives
Journal of Small Business Management	Journal of Business Research	Journal of Finance
Journal of Technology Transfer	Journal of Management	Journal of Financial Economics
Long Range Planning	Journal of Management Studies	Journal of Marketing
R&D Management	Leadership Quarterly	Marketing Science
Research Policy	Management Decision	MIS Quarterly
Research-Technology Management	Management Science	Nature
Small Business Economics	Organization Science	Regional Studies
Strategic Entrepreneurship Journal	Organization Studies	Review of Financial Studies
Techn. Forecasting and Social Change	Sloan Management Review	Science
Technovation	Strategic Management Journal	
Venture Capital	Strategy & Leadership	

Results and discussion

The resulting structure includes five chapters (one for each core innovation capability), with a total of 23 sections (innovation management themes related to various levels of analysis for each capability), subdivided alongside 80 illustrated "key insights" and 450 keywords.

The resulting inventory includes (as of April 2020) 2,300+ scientific articles, as well as a selection of 150 videos and 280 books. They are also supported by an eponymous reference book (see Bessant, 2019 for a review) and self-assessment app for smartphones.

This online "portal" to the literature aims at helping innovation managers, students and young researchers in quickly developing a preliminary view on the state-of-the-art literature regarding various innovation management topics and issues. It can of course be complemented when needed with a more focused traditional literature review.

Thus, innovation managers and students can on one hand gain access to a structured and up-to-date overview of the innovation management literature, and additionally may be able to quickly identify the key articles relevant to the specific challenges they have to cope with.

This information is made available without requiring scholarly knowledge of the relevant keywords and journals, while still leveraging high-quality journals from a wide range of relevant disciplines and including older but still relevant (highly-cited) references.

From a research viewpoint, this directory also provides indications of recurring innovation management themes (such as what is now called ambidexterity but which had already been studied decades ago) and controversies (for example regarding the benefits of R&D or first entry, or regarding the impact of size on innovation). It also highlights potential imbalances and gaps in

the available literature, for example regarding the best practices and decision-making processes related to the valuation, portfolio management and successful implementation of innovation opportunities.

Limitations and areas for feedback and development

Structuring, commenting on and developing such a directory is by nature a perilous and subjective exercise, in particular regarding the selection and sorting of the relevant references. The areas where we believe there is still significant room for improvement include:

- How to better deal with the potential selection bias that our approach generates? What could be the key issues, key insights and/or keywords missing?
- How to efficiently maintain such list of references in a pragmatic way? What would be the ideal "size" (number of references) moving forward, if any?
- How to make this material more relevant, visible, accessible and easy to use for its target audience?

Goethe is supposed to have said "there is nothing more frightful than ignorance in action". We hope to have contributed a small step towards the development of more science- and evidence-based innovation management.

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