

**EVIDENCE BASED MANAGEMENT:
THEORY, MODEL, TEST, AND TEMPLATE**

EVIDENCE BASED MANAGEMENT:
THEORY, MODEL, TEST, AND TEMPLATE

By:

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Abstract:

The broad purpose of this dissertation is to enhance the quality of managerial decisions through evidence-based management. Specifically, it raises three key questions: What is evidence? What are the attributes of knowledge that can facilitate informed decision making? How can such knowledge be generated? To answer these questions this thesis proposes a theory of evidence, suggesting that the strength of evidence is contingent upon its methodological fit, contextuality, transparency, replicability, and consensus. A model of evidence-based decision making is offered that explores how managers' judgment, experience, and personal values along with the values of other stakeholders, contextual factors, and ethical constraints, may affect the decision process. Moreover, this thesis argues that in order to foster evidence-based management practice we need knowledge that is rigorous, relevant and actionable. To this end, a theory of actionability is proposed, and an empirical study is conducted to determine the attributes of actionable management knowledge. Based on the study, an actionability index is suggested. Evidence that is actionable requires sustainable collaborative effort to produce, curate and communicate. To accomplish that a theory of evidence-based collaboration is proposed. This theory conceives the collaboration as an independent organization that oversees the process of bringing rigour, relevance, and actionability together, and provides an interactive platform for producers, arbiters and users of management knowledge to communicate and collaborate. A template, guided by the theory of collaboration, is designed to produce systematic reviews that are useful for management practice.

Preface:

This thesis consists of four papers. As they are all co-authored papers, the contribution of the thesis author is outlined below:

The first paper (Chapter 2), “Toward a theory of evidence-based decision making”, co-authored by Dr. Vishwanath Baba and Farimah HakemZadeh was published in the *50th Anniversary Special Issue of the Journal of Management Decision*. The names of the authors were listed alphabetically. The idea of the theory of evidence and the propositions were formed through discussion and brainstorming meetings between the authors. The first draft of the manuscript was written by Farimah HakemZadeh and edited and modified by Dr. Baba.

The second paper (Chapter 3), “A Theory of Actionability for Evidence-Based Management: Complementing Rigour and Relevance” is co-authored by Farimah HakemZadeh and Dr. Vishwanath Baba. The theoretical statement and propositions are the results of back and forth dialogues between the authors and comments and feedback received at the Academy of Management Conference where a poster of the paper was presented. The first draft of the manuscript was written by Farimah HakemZadeh and edited and modified by Dr. Baba. It is under review with *Management Decision*.

The third paper (Chapter 4), “Measuring the actionability of evidence for evidence-based Management” is co-authored by Farimah HakemZadeh and Dr. Vishwanath Baba. The paper received a request for minor revisions from the *Journal of Management Decision* and is currently under review. The study was designed, carried out, and analyzed by

Farimah HakemZadeh. The process was supervised by Dr. Vishwanath Baba, and results were interpreted and discussed jointly by the authors. The first draft was written by Farimah HakemZadeh and edited by Dr. Baba.

The fourth paper (Chapter 5), “Toward a Theory of Collaboration for Evidence-Based Management” is co-authored by Farimah HakemZadeh and Dr. Vishwanath Baba. The theory and propositions were written by Dr. Vishwanath Baba and discussed in detail in meetings with Farimah HakemZadeh. The main manuscript, in support of the propositions, was written by Farimah HakemZadeh and edited by Dr. Baba. It is under review with *Management Decision*.

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Table of Contents

Chapter 1: Introduction	1
References	4
Chapter 2: Toward a Theory of Evidence-Based Decision Making	5
2.1. Introduction	6
2.2. A critical review of the evidence-based management literature	7
2.3. Evidence-based practice	14
2.4. Evidence-based medicine to evidence-based management.....	17
2.5. Meaning of evidence	20
2.6. Toward a theory of evidence	22
2.7. A mixed-level theory of evidence-based decision making	36
2.8. Conclusion.....	52
References	55
Chapter 3: A Theory of Actionability for Evidence-Based Management: Complementing Rigour and Relevance	71
3.1. Introduction	73
3.2. The missing link: Actionability	77
3.3. Pathway to actionable knowledge: The Collaboration.....	90
3.4. Discussion	94
3.5. Conclusion.....	95
References	97
Chapter 4: Measuring the Actionability of Evidence for Evidence-Based Management	103
4.1. Introduction	105
4.2. Definition and theoretical foundation	109
4.3. Method	116
4.4. Analyses	122
4.5. Discussion	127
References	131

Chapter 5: Conclusion – Toward a Theory of Collaboration for Evidence-Based Management.....	142
5.1. Introduction	143
5.2. The need for EBMgt collaboration.....	144
5.3. A theory of collaboration in EBMgt	146
5.4. Discussion	177
References	180
Chapter 6: Conclusion.....	192
References	200

List of Figures

Figure 2-1- Theory of evidence	36
Figure 2-2- Model of evidence-based decision making	38
Figure 4-1- Schematic first order reflective- second order formative index of actionability.....	119
Figure 4-2- Two construct model for validation of formative measure of actionability.....	127
Figure 5-1- Evidence-based management collaboration: Stakeholders and their interactions.....	147
Figure 5-2- Evidence-based management process enabled by the Collaboration.....	176
Figure 6-1- Overview of the thesis	195

List of Tables

Table 4- 1- First order factors of actionability	124
Table 4- 2- Reflective items for actionability	125
Table 5- 1- Itemized checklist for Systematic Reviews.....	173

Chapter 1: Introduction

There is a shared concern amongst many management scholars that management research has not been able to effectively influence management practice (Kieser, Nicolai, and Seidl, 2015). This is in particular alarming as the core value of business and management research lies in the extent to which it can influence and benefit management practice (Martin, 2012). Empirical research confirms this concern (Rynes, Colbert, and Brown, 2002). Since management is considered an applied science, resolving this issue has become vital to the survival of the field and to the relevance of management education in meeting the demands of management practice (Pfeffer and Fong, 2002).

To date, various approaches, ranging from suggesting new research designs to recommending different dissemination and teaching methods, have been proposed to resolve this issue. This thesis in particular focuses on one of these approaches namely Evidence-Based Management, seeks to tackle some theoretical gaps and doubts, and to provide some empirical verification of concepts related to its literature. Evidence-based management (EBMgt) means integrating the best scientific principles into day-to-day organizational practices (Rousseau, 2006). Modeled after Evidence-Based Medicine, EBMgt's purpose is to enhance the quality of management practices by advocating "the scientific-informed practice of management" (Rousseau, 2012, p.xxiii) and equipping decision makers with the best available evidence. Arguing that many organizational decisions are based upon unwarranted data, managers' personal experiences, fashionable but untested management ideas, and careless benchmarking of successful practices, EBMgt

advocates evidence-informed decision making based on sound organizational and social science research (Pfeffer and Sutton, 2006). Critics argue that implementing Evidence-Based Medicine guidelines are not applicable to research in management (e.g. Barends, ten Have, and Huisman, 2012; Hodgkinson, 2011). The concern is that in medicine evidence is graded based on a strict hierarchy with randomized controlled trials considered to be the best available evidence, while such randomized controlled trials “are not possible in the same way in management research” (Axelsson, 1998, p. 13). Chapter 1 of this thesis focuses on answering this question and argues that for grading evidence in management we require a field-appropriate framework with respect to the ontology and epistemology of the field. Toward this end, a theory of evidence is proposed. This theory can be used as a basis of grading evidence in management. Another concern is that EBMgt neglects the reality that the decision making process in organizations is rarely purely rational and is often influenced by internal politics and interests of various stakeholders (Hodgkinson, 2011). A model of EBMgt decision making, offered in chapter 2, addresses this critique. This model emphasizes that contextual data and evidence complements the scientific evidence in the process of decision making particularly as there are many aspects of the practitioners’ problems that are yet un-answered through scientifically generated knowledge (Rousseau and Gunia,, 2016)

The other criticism towards EBMgt suggests that, unlike Evidence-based Medicine, EBMgt’s effectiveness is not based on evidence (Reay, Berta, & Kohn, 2009). However, Evidence-Based Medicine also started its journey without having any evidence of its effectiveness. Moreover, beyond its focus on the value of randomized controlled trials and

graded evidence, it presents the state of knowledge to practitioners in an actionable and concise format. While this thesis does not directly provide evidence for the effectiveness of EBMgt, by theorizing actionability (Chapter 1) and designing an index (Chapter 4) for actionability of management knowledge in chapter 3, it offers a critical tool that makes EBMgt testable. In order to assess the validity of the EBMgt claims and whether or not best evidence results in better decisions, this thesis offers a template for presenting the best evidence in an actionable format.

The final chapter of this thesis (Chapter 5), offers a mechanism through which the process of evidence evaluation, actionable reporting of evidence, and evidence dissemination can be facilitated. Inspired by Cochrane and Campbell Collaborations, as pioneers of Evidence-Based Medicine and Evidence-Based Policy making, a theory for Evidence-Based Management Collaboration is proposed. It is argued that to manage the marketplace of knowledge and research in an applied discipline, such as management, and to make EBMgt a reality, the field needs an independent organization to overlook the operation of making the best available evidence readily accessible to practitioners.

The hope here is that theories, models, and discussions provided in this thesis clarify some of the ambiguities and gaps in the literature and inspire researchers, experts, professionals, and key policy makers of the management discipline to move toward Evidence-Based Management.

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Chapter 2: Toward a Theory of Evidence-Based Decision Making

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Abstract

Purpose – The purpose of this paper is to integrate existing body of knowledge on evidence-based management, develop a theory of evidence, and propose a model of evidence-based decision making.

Design/methodology/approach – Following a literature review, the paper takes a conceptual approach toward developing a theory of evidence and a process model of decision making. Formal research propositions amplify both theory and model.

Findings – The paper suggests that decision making is at the heart of management practice. It underscores the importance of both research and experiential evidence for making professionally sound managerial decisions. It argues that the strength of evidence is a function of its rigor and relevance manifested by methodological fit, relevance to the context, transparency of its findings, replicability of the evidence, and the degree of consensus within the decision community. A multi-stage mixed level model of evidence-based decision making is proposed with suggestions for future research.

Practical implications – An explicit, formal, and systematic collaboration at the global level among the producers of evidence and its users akin to the Cochrane Collaboration will ensure sound evidence, contribute to decision quality, and enable professionalization of management practice.

Originality/value – The unique value contribution of this paper comes from a critical review of the evidence-based management literature, the articulation of a formal theory of evidence, and the development of a model for decision making driven by the theory of evidence.

Keywords – Evidence based management, Theory of evidence, Mixed level model of decision making, Global collaboration, Management strategy, Management theory

Paper type – Conceptual paper

2.1. Introduction

The study of evidence-based practices has become popular over the last few decades and there is a considerable body of literature targeted at promoting evidence based practices (Holloway, 2007; Reid and Spinks, 2007). While the available literature has added extensively to our knowledge about the benefits of evidence based practices in general and how evidence must be obtained, classified, and disseminated, findings have not been integrated systematically.

Decision making is arguably at the core of managerial tasks but often managers make decisions under pressure and with incomplete information. While some managers justify their choices on the basis of facts and evidence, many rely on outdated information, personal experience, individual observation, or gut feelings (Pfeffer and Sutton, 2006). In addition, managers are confronted by an overload of information and engage in practices which are hard to evaluate and sometimes irrelevant to the organization and context (Pfeffer and Sutton, 2006). The results of poorly supported decisions are choices that waste company resources and even risk the future of the organization. Many managers simply need guidance to make decisions based on reliable evidence. However there is no systematic yardstick to clue the decision maker as to what evidence is most reliable. What exactly is evidence? What evidence should be considered, under which circumstances, and why?

Sackett et al. (2000) define two separate stages for evidence-based practice: first, it is the stage of generating evidence, which relies on the academic body of a profession, and

second, the stage of using that evidence in practice, and making informed decisions based on those practices. This paper attempts to review existing knowledge on evidence-based decision making and proposes a theory of evidence that will allow managers to sort out the information needed for them to make a decision and place appropriate confidence in those decisions. Moreover this paper focuses on the process of evidence-based decision making and illustrates how constructs from different levels affect this process at each stage.

2.2. A critical review of the evidence-based management literature

While the field of evidence-based management is fairly young, it has become increasingly popular over the past few years. The existing literature is dominantly prescriptive, suggesting remedies to narrow the gap between research and practice in the field of management. The prescriptions are mainly in the areas of research methodology and management education and training, but very few attempt to explicitly describe and address the issue within the field of management. The literature is largely reflective of the authors' personal experience and perspective and generally lacks a solid empirical foundation. In addition, much of the literature draws on the philosophy of evidence-based medicine and examples of success from within the health care sector. While this research can be useful, it is important to note that recommendations on evidence-based medicine tend to be context independent and implicitly universal, while managerial prescriptions are contingent and sensitive to variation in the organizational context (Dean and Bowen, 1994). What seems to be lacking in the existing literature is a proper definition of evidence, and an agreed on theory and framework of evidence. Furthermore, the process of evidence-

based decision making and the effects of authority, organizational politics, and context on that process, although acknowledged (Rousseau and McCarthy, 2007), are not conceptualized and theorized.

The main focus of the existing literature is on the role of researchers and educators who enable and facilitate the process of evidence-based management. There are discussions about the similarities and differences between health care professionals and management practitioners. Whatever evidence is available in the field, the role of the manager and how the evidence can be used as a foundation for decision making are issues that are not often discussed.

The origin of evidence-based approaches can be traced back to the 1980s when the British government increasingly emphasized the need for informed policy and practices based on an accurate and challenging foundation of evidence (Tranfield et al., 2003). In particular it was the focus on the effectiveness of public services that gradually led to the development of detailed guidelines and best practices manuals in many disciplines (Tranfield et al., 2003). The evidence-based approach became particularly influential in medical science and health care by critiquing the implicit and eccentric data collection and interpretation methods (Cook et al., 1997b; Greenhalgh, 1997). Moreover, evidence-based medicine also resulted in identifying the most important and needed areas of research in medical practice through defining national level research strategies and encouraging effective dissemination and diffusion of research findings (Peckham, 1991). One of the most significant achievement of the evidence-based movement in the medical field was the improvement in the quality of the review process through systematic reviews that

synthesize research in a transparent and reproducible manner (Cook et al., 1997a,b; Wolf et al., 2001). The literature then evolved by incorporating the systematic review and meta-analysis as key tools in developing evidence for practice through reducing bias by means of exhaustive literature searches of both published and unpublished studies (Cook et al., 1997b). The literature on evidence-based management also suggests that a shift from traditional narrative reviews to systematic, context-sensitive research would be the appropriate methodology for developing evidence for the discipline (Tranfield et al., 2003). While acknowledging this need, Tranfield et al. (2003) compare management research with medical research on dimensions such as the nature of the discipline, research culture, research design, review protocol, etc. They claim that the nature of the management discipline is divergent while that of medicine is convergent (Tranfield et al., 2003). Consequently, the research culture in the field of medicine is subject to rigorous scientific evaluation while management research has a culture that is a split between positivist and phenomenological perspectives (Tranfield et al., 2003). They acknowledge the similarities and differences between research in the two practices and prescribe systematic reviews and certain dissemination and reporting methods as the remedy for closing the gap between research and practice (Tranfield et al., 2003).

However, they do not sufficiently emphasize the role of formal international bodies such as Campbell and Cochrane Collaborations that regulate the main steps of planning the review, conducting reviews, and reporting and dissemination of results in the field of medicine. Their prescriptions lament the absence of similar independent institutions within the field of management to act as key agents to implement research into practice, which

puts the burden solely on the shoulders of the researchers. In fact, there is no guidance in the management literature as to what passes as evidence and who is responsible for assessing the body of knowledge and evaluating the evidence that needs to be diffused to practitioners.

Another main focus of the literature on evidence-based management is educating managers. Rousseau and McCarthy (2007) suggest that if management education is focused on evidence, managerial decision making will improve and organizations will achieve better outcomes. This suggestion is mainly based on Peter Drucker's (1966) assertion of the repetitive nature of most business issues. It follows that for solving problems, managers can use related evidence-based principles to make effective decisions (Rousseau and McCarthy, 2007). Rousseau and McCarthy (2007) combine experiences in management education with those in the healthcare and offer descriptions of key features of teaching evidence-based management. They encourage educators to focus on principles where the science is clear and convergent (e.g. goal setting principles of Locke and Latham(1990)). Moreover Rousseau and McCarthy (2007) acknowledge that management research is fragmented, which makes it difficult to keep current with research findings. They further suggest that educators should develop decision awareness in management students so that they understand that every small action or non-action is itself a decision and an opportunity to implement evidence. However, there are several barriers for an evidence-based management education. For example, there exists no clear idea or rule for evidence in social science (Westen and Bradley, 2005). Furthermore, while medical education is extremely standardized, this is not the case for MBAs and other forms of management education.

Having a degree in management is neither a guarantee for management competency nor a requirement for practicing management (Pfeffer and Fong, 2002; Ghoshal, 2005; Mintzberg, 2005). Organizations such as Association for the Advancement of Collegiate Schools of Business (AACSB) do not yet have the power to enforce a training paradigm or methodology that would standardize management education.

Comparing the use of evidence in management and medical practice, it has been suggested that culture, research base, and decision making processes are very different in these two fields. In the field of medicine, the process of making evidence-based decisions is considered to be a multi-stage process that is affected by constructs from different levels. For example, the Promoting Action on Research Implementation in Health Services (PARIHS) framework proposes that for a successful implementation of evidence-based practice, there needs to be “clarity about the nature of the evidence being used, the quality of context, and the type of facilitation needed to ensure a successful change process” (Rycroft-Malone, 2004, p.121). While emphasizing the role of researchers as creators of evidence, and physicians as the main decision makers and users of evidence within the health care sector, Rycroft-Malone (2004) also takes the patient into consideration as the key stakeholder of the process and recognizes the importance of contextual constructs such as culture in both decision making and the implementation process. In an attempt to clarify the first stage of evidence-based management, a theory of evidence is proposed that offers a set of dimensions against which evidence can be evaluated such as methodological fit, contextualization, replicability, transparency, and consensus. The theory is driven by the principles of quality in social science research.

Focusing on the second stage of evidence-based management- using evidence to make informed decisions- a model is proposed based on a number of basic principles. First, the decision making process in organizations is not viewed from a purely rational perspective. There is no presumption of an ideal world in which rational decision making requires a complete search of all available practices and information about their consequences (Choo, 1996). It is, however, assumed that in reality, after the problems are simplified due to the capacity of human mind for formulating and solving complex problems (Simon, 1997), decision making in organization would be conducted by the principle of bounded rationality, rather than by comprehensive, objective rationality. Three categories that are mainly identified as bounds to human rationality are the decision maker's mental skills, habits, and reflexes (Simon, 1997). Based on similar logic, in order to understand managers' perception of evidence and their use of it in decision making, the model also takes the effects of experience and judgment on the process of decision making at the individual level. It discusses how available evidence will be used as the basis for decision making in the context of experience and bounded awareness. Bounded awareness refers to the "common tendency to overlook obvious, important, and readily available" evidence (Bazerman and Moore, 2008, P. 6).

Second, the model adopts a multi-level perspective and postulates a cross-level effect of contextual factors on the process of evidence-based decision making. In health care practice, the context is considered to be limitless as it can include communities and cultures that are in turn influenced by social, economic, political, historical, and psychosocial factors (Rycroft-Malone, 2004). In the proposed model, the term context is

used to refer to the organization, which is the relevant environment for pushing research evidence into practice. It is suggested that these contextual factors at higher levels of analysis can facilitate or confine the process of evidence-based decision making.

Third, the model discusses how demand for transparency of decisions and the decision process as well as the growth of public-interest and advocacy organizations have resulted in demands for higher levels of accountability on the part of decision makers (Gregory and Keeney, 1994). As a result, the decision process is also affected by the need to consider the often-conflicting objectives of different stakeholders. Decision makers need to generate alternatives that are based on stakeholders' values to achieve a certain balance (Gregory and Keeney, 1994). According to Clarkson's (1995) Stakeholder Framework, this perspective brings factors from various levels of analysis (institutional, organizational, and individual) into the model. The model incorporates the concept of agency theory in the process of decision making and includes the moderating effect of the decision maker's preferences and values. Finally, it acknowledges that choosing the final decision from the generated alternatives is a process that is ethically bounded. Before developing the model and building propositions, a discussion on the concept of evidence-based practice along with some definitions are provided. In addition, the critical steps that the field of medicine has taken toward evidence based practice are presented as a success story that can be used in benchmarking evidence-based management. The discussion is followed by a definition of what passes as evidence. Finally, based on the principles mentioned previously, a theory of evidence-based decision making is proposed.

2.3. Evidence-based practice

In medical practice, evidence-based medicine evolved as a way to minimize the gap that existed between research and clinical practice. This gap had serious consequences and often resulted in suboptimal medical care and procedures, as well as potential for unnecessary and avoidable harm to patients due to the lack of efficiency and effectiveness of incorporating the latest findings and procedures in practice (Sackett and Rosenberg, 1995a). In the field of medicine the gap between research and practice was particularly obvious due to the existence of large unwarranted variations in the provision of medical care (Wennberg, 1996). This claim is supported by studies which showed that some people were receiving more medical care than they actually needed while some were receiving less than required (Schuster et al., 1998). Studies also argue that the gap between research and medical practice is brought to light due to the growing observance of cases of overuse, underuse, and misuse of specific medical procedures (Chassin and Galvin, 1998). These studies and reports were all proof of the need for a practice which enables doctors to trace, decisively evaluate, and integrate evidence into their clinical practice. Sackett and Rosenberg (1995b) name such practice as evidence-based medicine. Sackett (1997) defines evidence-based medicine as a “way of thinking” that can be used to promote the implementation of research findings in clinical routines and practice and suggests that the best available knowledge about what actually works should be used in a “conscientious, explicit and judicious” manner in order to make decisions in medical care (Sackett, 1997). To make it more simple and practical, evidence-based medicine can be defined as

integrating physician's individual clinical expertise with the best external clinical evidence obtained from systematic research.

The existence of a gap between research and practice holds true in management and organizational science (Rynes et al., 2001; Pfeffer and Sutton, 2006). Similar to evidence-based medicine, evidence-based management is an approach that tries to enhance the quality of decisions made to solve organizational problems by deriving principles from external, systematic research to guide management practices (Rousseau, 2006). Although there is no strong proof and systematic research yet suggesting evidence-based management actually improves organizations' performance and helps managers make better decisions (Reay et al., 2009), the absence of proof cannot be used to discount evidence-based management's benefits to organizations (Briner et al., 2009). The generation of proof however, can convince people that evidence-based management approach can lead to better decisions within organizations.

Abrahamson and Eisenman (2001) describe the field of management as a market in which knowledge is the main commodity that is bought and sold. From their point of view, on the supply side of this market, there are consultants, journalists, and management scholars. These are the people who produce and disseminate knowledge which is consumed by those on the demand side of this market such as managers, students, executives, etc. (Abrahamson and Eisenman, 2001). Management scholars are also on the demand side of this market, in that they expand and explore the knowledge that is already disseminated into the market.

What is of concern, however, is that the state of this market is rather gloomy. According to Pfeffer and Sutton (2006), parts of the knowledge available out there consist of “deeply flawed standards” that are sometimes counterproductive. Evidence-based management, simply put, is a way to regulate methods of gathering and assessing management and business knowledge to produce better standards and guidelines. It is a way of steering the marketplace of management ideas (Pfeffer and Sutton, 2006) to achieve a higher quality of business knowledge which has been regulated, controlled, evaluated, and therefore considered more reliable.

The argument that evidence-based management is effective can be drawn from a rational interpretation based on the effectiveness of evidence-based medicine for curing patients and for structuring efficient public health policies. Pfeffer and Sutton (2006) argue that companies which base their decisions on evidence have a competitive advantage. This is mainly because management by intuition, the alternative approach to basing decisions on evidence (Gaynard, 2010), is hardly defensible. The traditional approach to decision making either relies largely on personal experience or blindly follows the advice of business books or consultants which are mostly driven by traditional beliefs or weak evidence (Rousseau, 2006). Thus, when there is little or no reliable information available to make decisions, the managers with the evidence-based management way of thinking, try to act on the basis of logic and evidence, rather than on guesswork and hope (Pfeffer and Sutton, 2006).

Although the term evidence-based management is relatively new, the basic idea is not. The notion that management research can and should be transferred into practice so

that practitioners can benefit from it has been in the literature for a long time (Rousseau, 2006). However, it has not yet found its way to the heart of the practice, and for several reasons, practitioners still prefer to rely on their own judgment or traditional beliefs. Several researchers have investigated the reasons that have precipitated this sad state of disconnect between research and practice in the field of management.

Explanations such as the fear of losing authority, the preference for only hearing good news rather than the truth, or the inefficiency and messiness of the marketplace of business ideas (Pfeffer and Sutton, 2006) have all been suggested as reasons for the unpopularity of evidence-based management among managers. The gap between research and practice in the field of management is particularly bothersome because the academic world of management and its research exist primarily to further the management profession. If the link between these two is nonexistent or broken, the legitimacy of the academy in this field will be under scrutiny.

2.4. Evidence-based medicine to evidence-based management

In addition to the explanations provided by scholars as to why decisions in organizations are not yet based on research findings and evidence, another valid argument is that the field of evidence-based management is suffering from the very illness it is trying to cure. That is, while the paradigm of evidence-based management is trying to encourage the adoption of a cumulative body of knowledge in the management field that is validated, verified, and ready to use by managers, it does not boast of a strong body of knowledge of

its own. One reason for this may be due to the lack of an agreed-on theory and framework in the field (Baba, 2004).

Pfeffer and Sutton (2006) suggested that in order for evidence-based management to become a practice in real organizational context, management can learn from the successful steps that other professions, such as medicine, have taken toward evidence-based practice. Although it has been discussed in medical literature over the past two decades, the movement of evidence-based medicine likely has its roots in an essay published in the 1970s by Archibald Lemman Cochrane in which he criticized the medical profession for not having an “organized critical summary [. . .] of all randomized controlled trials” (Cochrane, 1989). The challenge that Cochrane put on the medical profession later resulted in an independent international organization with the mission of establishing a knowledge base of up-to-date and accurate health care information – the Cochrane Collaboration- (Cochrane, 1989). Half a century after Cochrane’s critical review of the medical profession and decades after Sackett’s movement, evidence and evidence-based practice has become popular, even fashionable (Shortell et al., 2001), and has found its way through other fields such as education, policy making (Shortell et al., 2001), and management. However there are some specific steps that the profession of medicine has taken toward an evidence-based practice, especially toward establishing a strong cumulative body of knowledge that seems to be the Achilles’ heel of management.

The field of management in particular suffers from the absence of intellectual coherence in many of its subfields (Baba, 2004). Pfeffer and Sutton (2006) point out some of these incoherencies such as whether companies should really pursue excellence (Peters

and Waterman, 2004) or is the whole notion just a myth (Crawford and Mathews, 2003)? Should we avoid conflicts or not? Is charismatic leadership the key to success or is it quite the opposite? There are even contradicting ideas on the most researched and studied theories of management such as goal theory. While many argue that a challenging goal enhances performance, others imply that it can systematically reduce productivity. In the end, it may come down to which book one had read or which business school one had attended.

The management literature is also suffering from significant variation in which research is integrated into textbooks (Stambaugh and Trank, 2010) and course syllabi (Charlier et al., 2011) which makes it more challenging to achieve intellectual coherence. In the field of medicine, physicians are to some extent equipped with comprehensive and cumulative databases of the latest research and evidence in health care, such as the Cochrane Collaboration. Through this collaboration, health care providers, policy makers, and even patients are constantly preparing, updating, and facilitating access to a comprehensive database of latest research and clinical evidence through systematic reviews (Bero and Rennie, 1995). The timing is right for the field of management because researchers, practitioners, and other parties in organizational and management studies now have access to advanced technologies, research methods, bibliographic systems, and software (Chalmers and Altman, 1995), thus rendering the development of a comprehensive database of evidence possible.

Learning from the profession of medicine, one recommended approach is a paradigm shift which imposes changes on part of the researchers, publishers, facilitators,

and organizations (Walshe and Rundall, 2001). For example, at the academic level, Walshe and Rundall (2001) call for a change away from a fragmented research strategy to one that is more coherent at national and global levels. They also suggest a research direction that is more need-led and practice-oriented rather than research-led (Walshe and Rundall, 2001). They further recommend that research quality be enhanced through funding larger scale research and investing more in training researchers to provide more appropriate research methods (Walshe and Rundall, 2001). At the publisher and facilitator level, they recommend more modern ways of disseminating research findings (such as online databases), along with simplifying research findings in summaries and clinical guidelines, and pushing the research findings to their probable users rather than waiting for practitioners to pull the information toward themselves (Walshe and Rundall, 2001). This is a comprehensive guideline that focuses on the integrated aspects of a profession and calls for change in many different segments that can be a model for evidence-based management. The questions that still remain are: What is it that should be “pushed” to the probable users? How should the summaries and guidelines be prepared? How can the quality of research be improved? What passes as evidence?

2.5. Meaning of evidence

In the field of medicine, evidence is defined as the interpretation of empirical data which results from “formal research or systematic investigations using any type of science or social science methods” (Rychetnik et al., 2002). Fortunately the quality of research and the characteristics of evidence in the field of evidence-based medicine have been well

established (Fletcher and Sackett, 1979; Woolf et al., 1990). One of the main approaches to defining what qualifies as evidence in evidence-based medicine is through the use of categories of quality at different levels (Tillett et al., 1998; Sutherland, 2001). For example, a very well-known categorization is based on a hierarchy of study design (Campbell et al., 1963). Based on this grading scheme, the strongest evidence is derived from at least “one systematic review of multiple well-designed randomized controlled trials”, in the lower levels there are evidences “from at least one properly designed randomized controlled trial of appropriate size”, “well-designed trials such as pseudo-randomized or non-randomized trials, cohort studies, time series or matched case-controlled studies”, “well-designed non-experimental studies from more than one centre or research group or from case reports”, and “opinions of respected authorities, based on clinical evidence, descriptive studies or reports of expert committees” (Oxford Centre for Evidence-based Medicine, 2011).

The systematic logic behind the grading schemes and guidelines for evaluating evidence is mostly based on the rules established by the Canadian Task Force on the Periodic Health Examination (Fletcher and Sackett, 1979), which suggests specific criteria for evaluating and grading information including quality of study methods, number of studies, magnitude of effect, consistency, and generalizability of the findings. Therefore, a higher level of evidence results from a greater number of studies with better quality in design and methodology and with greater magnitudes. These experiences in evidence-based medicine suggest that the management profession should establish an independent organization for reviewing and grading all the findings in management and organizational studies and create a cumulative body of knowledge for managers.

2.6. Toward a theory of evidence

In order to address the challenge of what evidence is in managerial fields and the framework against which evidence can be evaluated and graded, a theory of evidence is proposed. “Evidence” is an ambiguous word (Miller and Safer, 1993). The most relevant definition for our purposes is evidence as a fact, organized body of information, or observation, which is presented to support or justify beliefs or inferences (Goodman and Royall, 1988; Sackett et al., 1996). In our view, in order for evidence to be useful it has to be rigorous and it has to be relevant to the context where it is invoked. In other words, rigour and relevance are at the heart of generating and evaluating evidence. That said, Briner et al. (2009) argue that it is both unfeasible and undesirable to copy the hierarchical evaluation system of the Cochrane model for grading evidence in management research. Briner et al. (2009) reason that all academic fields are different and what counts as “best” evidence is contingent on its appropriateness to the question being asked (Boaz and Ashby, 2003). This contingent nature seems to be captured in Upshur et al.’s (2001) ‘inclusive model’ of evidence. This model illustrates evidence through two dimensions of method and context.

Methodology is mainly concerned with how observations are conducted, collected, aggregated, analyzed, and interpreted. Context of the evidence, which in the medical field may range from individual care to population health and social policy, captures the extent to which evidence is tailored to the need of individuals or generalizable to the scope of population (Upshur et al., 2001). The main contribution of this model is that it takes a step

further from the purely hierarchical approach to evidence and acknowledges that evidence should be understood “as a mediation between the context of its use and method of its production” (Upshur et al., 2001). This understanding of evidence is particularly important because while quantitative research and measurement is essential for reasoning in the physical sciences (Vineis, 1997), qualitative research and meaning is also required for implementing the preferences and values of different stakeholders in the context of the practice.

As Briner et al. (2009) suggest, for the question of “what effect does intervention X have on outcome Y?”, a meta-analysis of randomized trials may produce the best possible evidence, while for answering the question of “how do women interpret their role on male-dominated boards?”, qualitative methods may be more appropriate to generate evidence. Furthermore, there are questions which require theory as well as evidence from which processes can be inferred. Therefore, for more complex management decisions, different forms of evidence need to be integrated (Briner et al., 2009). Consequently, unlike the Cochrane’s hierarchical grading of evidence, the best evidence in the managerial field can be quantitative, qualitative, theoretical or any combination of the three. In addition to the academic research findings, managers also need other sources and types of evidence depending on the circumstances and the type of decision they are making such as financial information, surveys, public opinion, practical experience, and internal organizational research.

While Upshur et al.’s (2001) model of evidence is focused on evidence in the field of medicine and defines method and context related to health care related practices, its

foundation can be a strong base for a theory of evidence in the field of management. In the proposed model, there are three main assumptions. First, evidence is that which is assumed to have a contingent nature. Based on this assumption, it is argued that the best evidence is the evidence which is produced with the proper methodology and from a context as close as possible to the context the evidence is to be implemented in. The second assumption is that the process by which evidence is generated should be replicable and transparent. Third, it is assumed that the probability of the accuracy of evidence is higher when consensus about that research evidence is higher. Therefore, we argue that the best evidence needs to be evaluated against methodological fit, contextualization, transparency, replicability, and consensus.

The issue of methodological fit in managerial and organizational studies, defined as “internal consistency among elements of a research project” (Edmondson and McManus, 2007, P. 1) plays a significant role in enhancing the quality and reliability of research findings (Bouchard, 1976; Campbell et al., 1982; Lee, 1999; McGrath, 1984). More importantly, methodological fit results in a more convergent body of knowledge (Edmondson and McManus, 2007). Simply put, methodological fit emphasizes not only selecting the right research method but also asking the right question, and using the most powerful approach to answer it (Bouchard, 1976). Overall, while the philosophical world view of the researcher affects the choice of methodology, the nature of the research question at hand is believed to be a significant factor in determining the appropriate research method (Creswell, 2009). In the field of organizational studies, research is categorized into the three general categories of quantitative, qualitative, and mixed method research (Creswell,

2009). Qualitative research strategies follow a post-positivist world view and challenge the traditional scientific belief of the existence of the absolute truth or knowledge, particularly when studying human behaviour (Phillips and Burbules, 2000). Survey research and experimental research are known to be the most common forms of quantitative studies that focus on describing behaviours and attitudes of a population by studying a sample of that population or studying how specific treatments can result in a certain outcome (Creswell, 2009). Qualitative research strategies, which have become more visible during the past few decades, adopt methods such as ethnography (LeCompte and Schensul, 1999), which studies individuals in their natural settings over a period of time and collects data through observation and interview, case studies, phenomenological, and narrative research (Creswell, 2009). Qualitative studies rely on social constructive (Crotty, 1998) and participatory (Kemmis and Wilkinson, 1998) world views that are based on the assumption that individuals develop subjective understandings and meanings from their experiences. Finally, mixed method or hybrid research strategies function under a pragmatic world view (Cherryholmes, 1992; Creswell, 2009) that is not necessarily committed to any one system of philosophy and reality and uses both quantitative and qualitative methods with different approaches to collect and analyze data. Creswell (2009) claims that different problems call for different approaches and points out that previous research and known facts about the phenomenon and problem play an important role in determining the appropriate research method (Creswell, 2009). For example, qualitative and exploratory research is useful when there is yet no clear understanding of which variables and constructs need to be studied.

Furthermore, qualitative studies may provide a deeper perspective on a particular group of individuals.

In another important work on the subject of methodological fit, McGrath (1964) categorizes how different research methods such as experimental simulations, laboratory experiments or computer simulations are appropriate for answering different questions. McGrath (1964) also emphasizes the importance of the “state of prior knowledge” for determining the right research method and stresses that field studies are very appropriate methods in validating established theories in the real world setting.

Edmondson and McManus (2007) define four key elements in determining the right methodology for field research, namely research question, prior work, research design, and contribution to literature. The foundation of their framework is defining the state of different theories in management research along a continuum from mature theories to nascent ones (Edmondson and McManus, 2007). According to their framework, mature theories are well developed and usually have broader points of agreement over constructs and the relationship among them. Nascent theories on the other end propose new connections between phenomena. By describing theories on a spectrum of maturity, Edmondson and McManus (2007) recommend which types of questions need to be asked at different levels and whether qualitative, quantitative, or mixed method research strategies are the most appropriate way of tackling the research question. In addition, they make suggestions on the appropriate data collection techniques and analytic approaches. The significant contribution of this framework is a notion of methodological fit that systematically recognizes how previous studies affect the research methodological

decisions and the ways in which they will contribute to the literature. It is a valuable tool that can steer the body of knowledge in management to a more convergent state. A poor methodological fit may result in the re-invention of the wheel under a new name, losing the opportunity of generating new knowledge, and engendering some unevenness in the evidence (Edmondson and McManus, 2007) that would lead to a divergent body of knowledge and produce unreliable pieces of information.

P1. In the context of evidence-based management, evidence is more reliable when its method of production fits with the type of managerial question.

Another aspect that affects the accuracy and reliability of the generated evidence is the issue of contextualization. The Merriam-Webster dictionary defines context as “the interrelated conditions in which something exists or occurs” (2011). It refers to the environment and setting that surrounds the phenomenon under investigation. Contextualization helps to link observation to relevant facts, events, and points of view (Rousseau and Fried, 2001).

Attention to contextualization has significantly increased over the past 30 years (Roberts et al., 1978; Cappelli and Sherer, 1991; Johns, 2006). One reason for this increasing interest in contextualized research is globalization. Globalization is a term mainly used to describe the increasing integration of political, informational, and financial domains of regional economies around the world. As Friedman (2005) states: “The World is [now] flat”. In business terms, this means that markets are being integrated and a new economy is emerging in which businesses function across boundaries and borders. In such

an environment, organizations are faced with new dynamics of different cultures and business settings, and managers need evidence from other cultures and environments to be able to make the right decisions. This calls for more comparative studies that simultaneously look for emergent universality and cultural specificity (Adler, 1983, 2002). Studies across different cultures and environments call for special attention to the process through which constructs and research methodologies are transformed across national borders (Rousseau and Fried, 2001; Adler and Gundersen, 2008;). This issue highlights the importance of including contextual factors in different stages of research in order to achieve more convergence and acknowledge contextual differences as a major source of conflicting findings in the management literature (Rousseau and Fried, 2001).

Another factor that makes the role of contextualization essential for ensuring the reliability of evidence is that the nature of work is changing and is significantly modifying the nature of the relationship between the worker and the organization (Rousseau and Fried, 2001). First of all, the political context of employment is shifting as governments are increasingly regulating the relationship between employers and employees which has led to an increase in lawsuits against organizations (Howard, 1995). While some believe that the power of unions and labor organizations tend to weaken during globalization (Wallerstein and Western, 2000), others argue that labor unions can actually be strengthened in developing economies because of the urban wage rate and globalization (Beladi et al., 2011). This suggests that organizations and employees are increasingly striving toward either synergy or compromise between their interests. Second, today's economic environment is extremely technology-driven (West, 2011). This has resulted in

the emergence of virtual businesses, the elimination of many intermediaries, an increase in the speed of transactions, and significant changes in the power distribution within organizations. Third, workers and their skills have also changed dramatically. The significant boost in life expectancy at birth shows that the working-age of the population and the number of elderly employed has increased (Perry, 2010). Immigration has also resulted in dramatic changes in the work force and has resulted in a multicultural workplace in which individuals come from varied cultural backgrounds, with different values, and degrees from a variety of educational systems around the world (Mare' et al., 2010). The changes in the structure of jobs have also been advantageous to women and have lessened the sex segregation of the labor market (Barnes, 2010). Now Millennials and the children of Generation X and the Baby Boomers are gradually entering the work force. This generation is believed to be the first “digital native” generation (Prensky, 2001; Tufts, 2011) for who the computer and the Internet is considered to be an integral part of life rather than just task-enabling technology. As Millennials enter the workforce in large numbers, the business rules are bending to accommodate them (Twenge and Campbell, 2008; Wey Smola and Sutton, 2002).

According to Rousseau and Fried (2001), contextualization of research would make it possible to face the previous challenges as it would facilitate comparison of constructs of a particular study in a particular site to those of previous research. It also helps to specify the frame of reference and point of view that a particular study focuses on (Rousseau and Fried, 2001). Moreover, contextualization allows researchers to understand how historical events and time may affect results, and to compare different characteristics of their samples

of workers, units, or organizations to those of previous researchers (Rousseau and Fried, 2001). More importantly, it would provide a new perspective through which researchers can explain similarities or differences between their findings and that which exists in the literature. This would provide more sophistication and contextual finesse to the managerial body of knowledge. In essence, contextualization of organizational research acknowledges the complexity of social reality under investigation and produces more reliable evidence by understanding the dynamic interplay between contextual factors and the constructs and relationships of interest (Bamberger, 2008).

P2. In the context of evidence-based management, evidence is more reliable when its method of production includes more contextual factors.

One of the concerns regarding the reliability of evidence and research findings for the purpose of evidence-based decision making is the widespread deficiencies in social science research (Van de Ven, 2007). The medical field had also faced a similar concern (Simera et al., 2009) especially as research became more commercialized and funded by different organizations who benefitted from particular results privileging their products and services rather than from true and accurate results (Sharpe, 2002). To address this issue and to also strengthen the conflict of interest policies and procedures in medical research, academic institutions and influential journals have taken steps to make it possible for editorial boards and authorized government agencies to have access to the data used in research reports (Sharpe, 2002). An international network, Enhancing the Quality and Transparency of Health Research (EQUATOR) has also been launched (Simera et al., 2009), with the aim of promoting transparent and accurate reporting (Groves, 2008).

EQUATOR network provides authors and journals with specific guidelines on requirements of transparent reports tailored for different research methods (Groves, 2008). Similar guidelines need to be developed for the field of management in order to ensure the accuracy of research findings by allowing funding agencies, editorial boards, and eventually the Collaboration, when it is in place, to access the data. These guidelines need to specify the type and amount of information required in a research report that would make replication of the research possible. Therefore it is proposed that:

P3. In the context of evidence-based management, evidence is more reliable when its method of production is more transparent.

The purpose of evidence-based management is to boost confidence in research findings by making explicit their context, methodology, and their applicability to the context of their development. Another dimension against which evidence needs to be evaluated is the replicability and consistency of results. Replication is argued to be “at the heart of any science” (Utts, 1999, p.3) and is known to be a critical test of objectivity (Chaplin and Krawiec, 1979; Fiorentine and Hillhouse, 2003). It is also an important means through which theories can either be confirmed or falsified (Lamal, 1990). Management theories are often argued to be challenging in this matter as organizations are inherently complex, open, and functioning in constantly changing contexts (Astley and Van de Ven, 1983; Fabian, 2000). As a result, organizational researchers have been more focused on theory building (Weick, 1989; Lewis and Grimes, 1999; Pentland, 1999; Locke, 2007) than on testing the theories (Davis and Marquis, 2005; Hambrick, 2007).

This is unfortunate because although social science theories have limited scope and limited predictive and explanatory power compared to other disciplines, they are at least to some extent, empirically testable (Lamal, 1990). Like other sciences, they can make propositions that can be confirmed by experience. In other words, replications promote external validity, as long as the findings are in agreement with those of the study being replicated (Lamal, 1990). Furthermore, replication can be particularly useful when there are disagreements over previous findings (Sidman, 1960).

Replicability is about producing similar results in similar settings (Sekaran, 2006). For quantitative studies, replicability of research and convergence of managerial knowledge can be improved by clearly identifying the sources of errors such as in measurement, sampling, internal validity, and statistical conclusion (Malhotra and Grover, 1998). As surveys are known to be a common form of data collection in quantitative studies, “replication of experiment” can be obtained from deriving a “coefficient of agreement” between different tests of a measurement (Maxwell and Pilliner, 1968; Mellenbergh, 1977). Eventually, these should become part of the methodology of the Collaboration.

For qualitative studies, the story is somewhat different. For example, Janesick (1994) suggests generalizability may indeed be an issue. She argues that the value of case studies, as an example of qualitative studies, is in their uniqueness and therefore replicability is pointless (Janesick, 1994). Huberman and Miles (1994), on the other hand suggest that replication in case studies is possible through successive waves of data collection. This form of replication is not for the sake of generalizability but rather for

understanding the conditions under which a particular finding appears and operates (Huberman and Miles, 1994).

The issue of replication is of particular concern in the field of organizational research as most journals are more interested in reporting novel studies and findings rather than replications for confirmation studies. Therefore, there is not much incentive in conducting this type of research (Lubin, 1957). Theory testing is less glamorous and the reward structures are skewed toward theory building. Management research programs are funded for theoretical impact as opposed to replication of existing theories. This is a challenge for evidence-based management as it discourages large scale development of evidence. In the context of evidence-based management, replication is particularly valuable as it not only helps to take management science to a more convergent state through replication of quantitative studies, but also helps to contextualize research findings through replication of qualitative studies. This calls for a different view of research in management with appropriate recognition and reward system.

P4. In the context of evidence-based management, evidence is more reliable when its method of production is more replicable.

It is logical to expect evidence to be evaluated and assessed before being disseminated to managers and implemented into practice. In the inefficient marketplace of managerial ideas and practices, systematic reviews are one way to condense evidence into a manageable and readable format (Chalmers and Altman, 1995; Cook et al., 1997b). In addition, they can provide practitioners with an overview of the extent to which researchers

and scholars agree or disagree on certain research findings. According to GreenFact foundation, a not-for profit organization with the mission of bringing complex scientific consensus reports on health and environmental studies to the reach of non-specialists, scientific consensus represents the experts' and specialists' collective position and opinion on a subject at a given time (GreenFact, n.d.). While scientific consensus is not always an articulation of “truth” and not all scientists are unanimous about results and research findings, consensus is still the best bet for practitioners. A high level of consensus among particular practices can be used as an indicator of the reliability and dependability of research findings (Pfeffer, 1993).

Scholarly consensus has long been used to evaluate paradigm development in different disciplines (Kuhn, 1970). Furthermore, higher consensus results in more efficient communication between researchers that can lead to shared definition of concepts, agreement on the frontiers of the discipline (Lodahl and Gordon, 1972), and collaborative research (Pfeffer, 1993). In general, while different subspecialties of organizational studies have different levels of consensus on evidence, the field itself is known to have a low level of paradigm development (Pfeffer, 1993). That said, scientific consensus can still be used as a basis for accepting the reliability and validity of evidence in managerial science as it is the case for other disciplines such as environmental policies, medicine, etc. (Devlin and Williams, 1992; Lindzen, 1992; Hauschild et al., 2008; Kahan et al., 2011).

P5. In the context of evidence-based management, evidence is more reliable when there is greater consensus.

As was discussed, evidence-based management suggests that managers need to base their decision on sound evidence in order to increase the probability of making the right decision. However, for evidence to be reliable and of a high quality there needs to be a systematic assessment of the research findings. Learning from the discipline of medicine and Cochrane guidelines for generating evidence, we propose that these assessment and reviews need to be the output of an independent organization with the aim of producing high-quality, evidence-based management databases. These reviews need to be updated frequently and take the most recent research into consideration (Higgins and Green, 2011).

We propose that the initial step in conducting these reviews is to clearly define the review question, determine an appropriate methodology, (Higgins and Green, 2011) and use methodological fit as the main criterion for selecting, reviewing, and evaluating related studies. In order to generate the best evidence from the selected research, studies should be ranked according to their degree of contextualization, replicability, and transparency. The evidence becomes stronger when there is scholarly and expert consensus and agreement over the findings. In essence, what the theory of evidence seeks is convergence among the dimensions. It is this convergence that ensures optimization of rigour and relevance. This convergence is engineered through a formal collaboration (similar to the Cochrane model) of management scholars, editors of management journals, and practicing managers (see Figure 2-1). In other words, a strong collaboration among both the producers and users of evidence is likely to enhance the quality and strength of evidence.

P6. The evidence is stronger when there is a greater degree of overlap between the dimensions of methodological fit, contextualization, replicability, transparency and

consensus. The overlap is engineered and enhanced by an established collaboration among the producers and users of evidence.

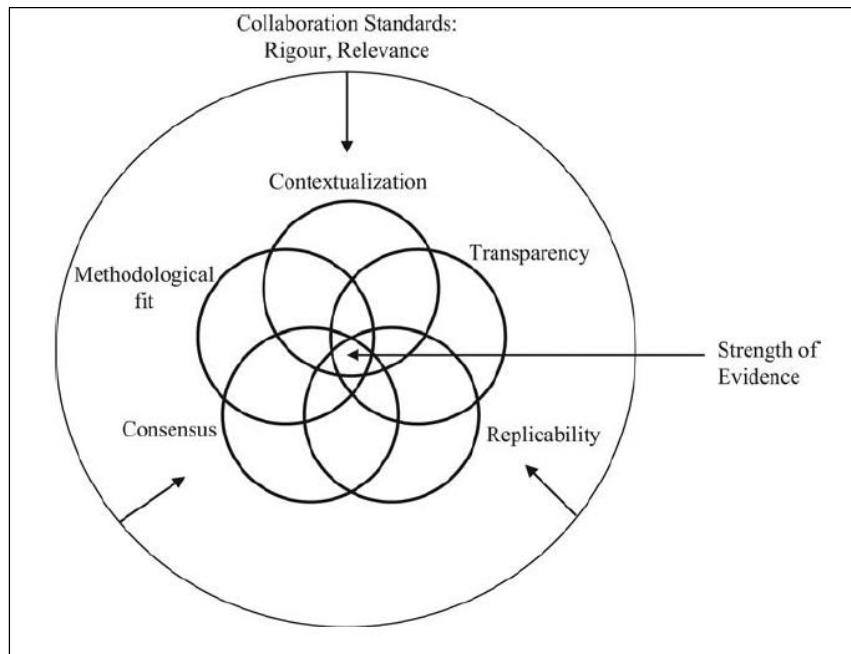


Figure 0-1- Theory of evidence

2.7. A mixed-level theory of evidence-based decision making

After the initial stage of generating and evaluating evidence, the next stage is the process of evidence-based decision making, for which a model is proposed. In the model, evidence-based decision making is viewed as a dynamic process through which evidence is obtained, interpreted, and used as a basis for decision making. The theory does not take the common six-step rational decision making process perspective of defining the problem,

identifying the criteria, weighing the criteria, generating alternatives, rating the alternatives on each criterion, and making the optimal decision.

This is because rational decision making has rarely been observed in actual organization settings (Rode, 1992; Bazerman and Moore, 2009), owing to the limitations in human informational and computational rationality (March, 1978). The model focuses on how evidence is transformed into management decisions within the organizational context. Regardless of whether evidence is disseminated to managers through their education and training or is sought by them according to their own chosen methods, it is not always used in a rational manner. The model views evidence-based decision making as a multi-level phenomenon expressed at the individual level, but influenced by cross-level constructs at individual, organizational, and institutional levels independently and interactively. At the individual level, what managers use as evidence for generating decision options is a function of their education, training, experience, and judgment. Furthermore, the process of evidence-based decision making is influenced by managers' references and values as well as stakeholders' preferences within institutional, organizational, and individual contexts. Finally, managers may also face ethical constraints at both organizational and individual levels in making the final decision from the generated decision options. Based on the previous argument a mixed-level model of evidence based decision making is presented in Figure 2-2:

P1. Evidence-based decision making is a multi-level phenomenon expressed at the individual level, influenced by cross-level constructs at individual, organizational, and institutional levels independently and interactively.

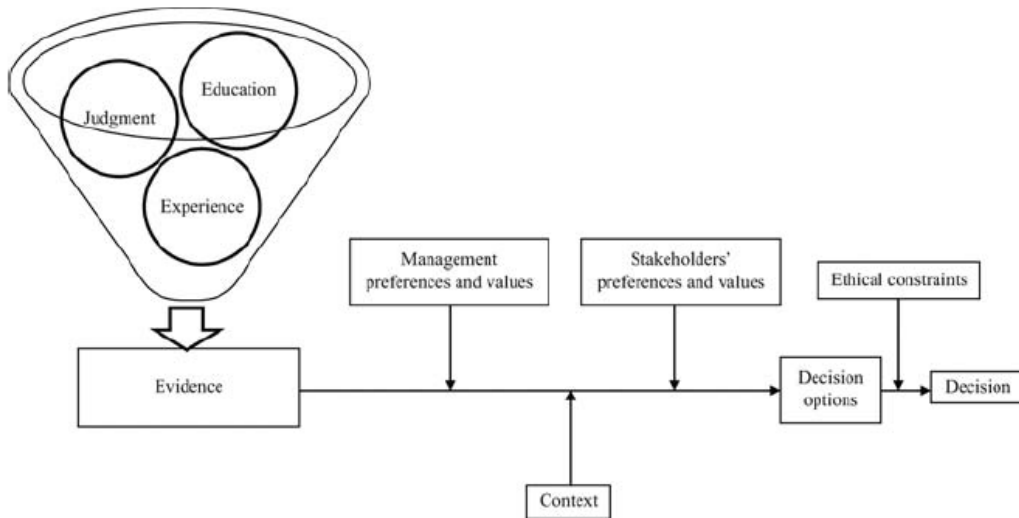


Figure 2-2- Model of evidence-based decision making

Highlighting the importance of decisions managers make on the performance of their firms, Rousseau (2006) argues that managerial competence is an important and vital factor for organizations. The debate over ways to evaluate training and competency for practitioners is far more consistent in the medical field than in the field of management (Shaneyfelt et al., 2006). One possible reason is that medicine is better developed as a profession than management. For example, the profession of medicine involves the application of a specialized body of knowledge and an effort to continuously enlarge that knowledge (Swick, 2000). Moreover, those in the medical profession are educated with a unique and agreed on body of knowledge (Cruess and Cruess, 1997). They also go through long periods of training subsequent to their education (Cruess and Cruess, 1997). While it is well-known that sound management practices are crucial for the survival and success of organizations (Rubin and Dierdorff, 2011), there are concerns about the accuracy,

reliability and relevancy of what is actually taught in MBA programs and other business education curricula (Datar et al., 2011; Rubin and Dierdorff, 2011). This is quite unlike the practice in medical education.

Looking at the history of management, business schools have recently been promoting the idea of management as a profession and are taking steps toward becoming the primary custodians of management training (Khurana, 2010). They also have the means of disseminating research evidence to future managers through formal management education programs. Nevertheless, having a formal education by itself is not a guarantee that management students have actually been exposed to the best available evidence and are familiar with the strongest research findings. Even textbooks do not incorporate important research findings and many who are teaching in business schools are not fully aware of scientific evidences in the field (Trank and Rynes, 2003). In fact, many management education programs do not focus on research evidence at all (Trank and Rynes, 2003). There are studies that suggest that what is taught in business schools is not strongly related to what is actually important for successfully leading a business. Consequently the schools are not very effective in training their graduates toward professional competence and subsequent career success (Pfeffer and Fong, 2002). This is largely due to the absence of rigorous and relevant evidence, gathered systematically and available readily.

Some findings show that business schools over-emphasize quantitative analytical techniques and underestimate the importance of leadership, interpersonal and communication skills (Porter and McKibbin, 1988, p. 65). Some even argue that

management education re-enforces the “technicist and commonsensical understandings” of those enrolled in these programs (Grey and Mitev, 1995), which are not necessarily backed by evidence. However, this is not the case for all business schools, and graduates from schools that actually expose their students to research-based evidence may have higher probability of transferring their learning into practice and base their decisions on this information.

In addition to the formal education that is offered in business schools, managers have the opportunity to be enrolled in various continuing education programs such as executive or enterprise education programs and workshops. In medicine, the continuing education programs are widely used in order to enhance the implementation of evidence by practitioners, and to expose them to the best available practices supported through research findings (Kitson et al., 1998; Sackett et al., 1996; Cullen et al., 2011). Although the effectiveness of this method in increasing the quality of care is still under question (Davis et al., 1992), the evidence shows that it substantially increases physician’s knowledge (Davis et al., 1992).

Ideally, managers can be exposed to best evidence through related management journals and specialty periodicals. However, in a study conducted among nearly 1,000 human resources vice presidents, Rynes et al. (2002) noted that there is a widespread disagreement or lack of knowledge about some effective HR practices in spite of the strong foundation of evidence they are built on. In a later study, Rynes et al. (2007) reported that these effective HR practices are also under-represented in the periodicals and journals

available to these managers. Such fragmentation of knowledge and balkanization among its adherents render evidence-based decision making difficult if not impossible.

Another individual difference that seems to affect the decision making process is an individual's prior experience. Experts are considered to be experienced, capable within a specific domain, and are believed to have superior ability to identify relevant information, and employ effective information-gathering strategies (Shanteau, 1992). In the case of evidence-based decision making, it would then be logical to assume that experts are able to distinguish between relevant and irrelevant evidence pertaining to the decision on hand. In addition, experts appear to be more knowledgeable, not only due to their highly developed perceptual/attentional abilities, ability to simplify complex problems, and greater creativity when faced with novel problems – but also because they possess up-to-date content knowledge (Shanteau, 1988). Experts have the cultivated ability to recall patterns of relevant information from their domain (Chase and Simon, 1973). From this we can see that expert managers would be more capable of recalling relevant evidence to their area of decision making compared to less-experienced managers.

That said, experts are also considered to be overconfident and poorly calibrated (Christensen-Szalanski and Bushyhead, 1981). An individual is highly calibrated when there is a good fit between the quantity of his/her correct responses and his/her probability estimate of that quantity (Spence, 1996). Research has distinguished calibration in experts in different domains. For example, it is suggested that expert weather forecasters are very well calibrated (Murphy and Winkler, 1977), while doctors seem to be poorly calibrated and overconfident (Christensen-Szalanski and Bushyhead, 1981). Because of this

overconfidence, experts may become “cognitive misers” who cut their evidence seeking short (Mahajan, 1992; Shepherd et al., 2003).

While managers’ experience, including their formal education, involvement in continuous learning, and exposure to the evidence base of their field through specialty periodicals may affect their utilization of evidence in the decision making process, their rationality is bounded like any other human being. In their book “Judgment in Managerial Decision Making”, Bazerman and Moore (2009) offer an overview of limitations of management rationality and its effects on managerial decision making.

For example, the availability heuristic – relying on readily available knowledge in order to make decisions (Tversky and Kahneman, 1973) – suggests that managers are more likely to utilize information and evidence that they have been recently exposed to or have encountered an example of and therefore can easily recall. The vividness of experience also affects managers’ decision making. Therefore, it is logical to expect that managers are more likely to utilize evidence they can easily retrieve not only because they have recently become familiarized with it but also because that evidence has been exposed to them more vividly in training sessions introducing a new technique. However, vividness is no substitute to veracity. As Pfeffer and Sutton (2006) suggest there are many false practices and “absolute nonsense” that are widely implemented by managers because they are made more appealing through persuasive promotions presented as “breakthrough” ideas. Managers may also selectively search and use evidence that is more likely to confirm their beliefs or the conclusion they desire to reach (Pfeffer and Sutton, 2006). In addition, a manager may choose to discard or accept evidence because of escalation of commitment

(Bazerman et al., 1984; McCarthy et al., 1993; Rutledge, 2011) and a desire to stick with a previous course of action.

Based on the ideas and discussions presented here, the proposed model suggests that managers' implementation of evidence in the process of decision making in organizations depends on several individual level characteristics such as manager's training and education, experience, and judgment. These characteristics affect the managers' level of exposure to and knowledge of evidence, re-evaluation of scientific evidence, and their tendency to accept or discard it.

P2. At the individual level, what managers use as evidence for generating decision options is a function of their training and education, experience, and judgment.

Another issue that needs close attention is that in many organizations the management (the agent making the decision) is separate from the owners and shareholders (principals). Agency theory explores the effects of this reality on the actions and performance of managers. Through the lens of agency theory, the firm is viewed as a system in which complex written and unwritten contracts exist between individuals (Fama and Jensen, 1983). The main argument here is that both managers and owners of a firm strive to maximize their utility, while their interest may at times be conflicting. It is suggested that the principal (owner) would seek to control the agent (manager) through contracts that specify each party's rights, rewards, and incentive structure

(Fama and Jensen, 1983). This reality affects the process of evidence-based decision making as managers tend to utilize evidence according to their ability to maximize their

interests, while the controlling, monitoring, and incentive systems in place would impose a structure to protect the owners' interests.

In the field of medicine, the effect of economic incentives on the physicians' actions have been discussed through several studies (Held and Reinhardt, 1979; Gaynor and Pauly, 1987; Conrad et al., 1998; Grumbach et al., 1998; Pauly, 1992). The discussion expanded into the literature of evidence-based medicine, suggesting that when financial incentives are designed to reward cutting cost, physicians tend to use fewer tests or order less expensive tests, procedures, and treatments (Shortell et al., 2001). Using the same line of argument, when incentives to increase productivity are in place, physicians tend to produce more units of service or see more patients (Shortell et al., 2001). Moreover, incentives promoting quality achievement are known to be associated with behaviors targeting quality, which include prevention or early detection procedures such as immunization, mammography screening, etc. (Shortell et al., 2001). Although some of these incentive policies may result in one stakeholder's satisfaction under certain circumstances, they may also result in unsupported and suboptimal medical practices and the tendency to ignore evidence.

Evidence shows that compensation plans that link pay to performance and are approved by a firm's board of directors are positively related to shareholders' wealth (Smith and Watts, 1986). Examples of this type of incentive plan include compensating managers with company stock, salaries, and/or bonuses (Jensen et al., 2010). Although linking executives' pay to performance seems like a logical way of approaching managerial level incentives, there are still examples of publicly held companies in which executives are

compensated regardless of their performance (Bebchuk and Fried, 2006; Jensen et al., 2010). There is a concern that top managers may act more like bureaucrats rather than the value-maximizing agents in those organizations (Jensen et al., 2010). In addition, it is well-known that monetary incentives do not always work as the central motivator for peoples' behaviors (Pfeffer and Sutton, 2006). Benefits such as authority and power, status and prestige, and even public visibility affect the level and effectiveness of monetary compensation necessary for motivating managers to make decisions aligned with the interest of their firms' owners (Jensen et al., 2010).

One factor that seems obvious in analyzing the extent to which evidence-based practice is implemented is the degree to which individuals are held responsible for the decisions they are making. This is at least the case in evidence-based medicine. Some scholars even argue that dismissal threats can play the same role in holding managers responsible for the decisions they make for the firm (Jensen et al., 2010). Although the intensity of such threats is fundamentally different in the medical field and managerial field, the cost of disclosure can also be considered high.

Apart from the efforts of economic alignment between managers and the organization, the firm's compensation policies should be perceived as fair in order for managers to be motivated and willing to participate in courses of actions that benefit the owner (Lind and Tyler, 1988; Kim and Mauborgne, 1993; Korsgaard et al., 1995). In the context of executive payment, the incentive policies are considered to be fair if they are tied to the external market (Coughlan and Schmidt, 1985; Deckop, 1988; Finkelstein and Hambrick, 1989; Jensen et al., 2010). However, this "fairness" is often achieved through

negotiation rather than through defined salary grades and ranges which are linked to the external market information (Bebchuk and Fried, 2006). Hence, one can infer that a just and reasonable incentive policy is more likely to motivate managers in implementing evidence-based management. Thus managers' values and preferences affect the process of evidence-based management as managers would be motivated to make decisions that serve their interests.

P3. The process of generating decision options is influenced by managers' preferences and values at the individual level.

One issue that takes the decision making process in organizations beyond the conflict of interest between ownership and management is that there are various other stakeholders whose objectives are often contradictory. For example, managers are increasingly adopting environmentally-friendly strategies. Delmas and Toffel (2004) suggest that government, regulators, customers, competitors, community and environment interest groups, and industry associations have their own preferences and values that impose pressure on organizations and influence the process of decision making. The values, preferences, and power these principals and society have over the organization and the way they influence organizational practices can be studied through institutional theory at the institutional level (Delmas and Toffel, 2004).

As was discussed, within agency theory there are incentive systems, control strategies and reward mechanisms (Fama, 1980; Tosi et al., 1997) that influence the process of evidence-based decision making at the organizational level. Moreover, employees are

also considered to be stakeholders who influence the decision making process (Hill and Jones, 1992). For example, their individual preferences toward change implementation may affect the process. Managers may re-evaluate their decision options because of the pressure and power of stakeholders with conflicting values and preferences, at institutional, organizational and individual levels.

P4. The process of generating decision options is influenced by stakeholders' preferences from institutional, organizational, and individual levels.

The process of translating evidence into practice also known as research utilization happens within an organizational context (Stetler, 2003). The context of an organization has a great impact on the process of research adoption and can either ease or hinder that process (Solberg et al., 2000; Brendan McCormack et al., 2002).

There are many different aspects of an organization's context that may affect the implementation of evidence-based practice. Culture not only plays an important role in defining the context of an organization but also affects the way it operates. For example, even though compensation incentives seem like a necessary condition to promote evidence-based practice in an organization, they do not seem sufficient. While compensation systems and procedures are considered to be a way of managing and influencing the culture of an organization and shaping it in the desired manner (Kerr and Slocum, 1987), the culture itself influences the way compensation systems are designed (Schuler and Rogovsky, 1998), especially how CEOs and managers are rewarded (Tosi and Greckhamer, 2004).

Therefore, it can be seen that a firm's compensation policies and procedures do not function independently of its culture.

Thus, implementing evidence-based management and achieving an evidence-based organization needs some cultural and collective actions (Shortell et al., 2001). There are several approaches to exploring the culture of an organization based on the nature of the problem at hand. In their book "Hard facts, dangerous half-truths and total nonsense", Pfeffer and Sutton (2006) point out two important sets of values that can contribute to the implementation the evidence-based practice: readiness to change beliefs and conventional wisdom, and obligation to collect facts and information required to formulate well-informed and intelligent decisions (Pfeffer and Sutton, 2006). Therefore, it can be concluded that cultural aspects associated with change and the organization's value system should be explored in studying the characteristics of an evidence-based organization.

Pfeffer and Sutton (2006) further suggest that one of the reasons managers do not use evidence as the basis of their decision making is that it changes the power dynamics inside the organization. In a culture supportive of evidence-based decision making, decision power would be distributed according to individuals' competency and mastery of evidence as a critical resource for decision making rather than organizational politics and structural power. Furthermore, adequate management information and decision support systems are essential for managers to make informed decisions and identify the relevance of the evidence to a particular problem. It is therefore proposed that:

P5. The process of generating decision options is influenced by the context in which the decision is being made through structural, environmental, cultural, and political constraints.

One aspect of decision making that has received substantial attention from researchers in the field of organizational studies is the issue of ethical considerations. Kohlberg (1969) proposed a theory of cognitive moral judgment for understanding the ethical decision making process. He suggested that individuals identify and reason out ethical dilemmas according to their moral cognitive development (Kohlberg, 1969). Based on Kohlberg's (1969) theory, Rest and Barnett (1986) developed a model of moral or ethical decision making that explored the link between moral reasoning and moral behaviour through the stages of moral awareness, evaluation, intention, and behaviour. Using their model as a base, Trevino (1986) proposed an interactional model of ethical decision making in which the moral reasoning process was explained through interactions of individual and situational components. Subsequently, Jones (1991) further developed a framework of moral intensity in which he characterized an ethical issue based on six dimensions: magnitude of consequences, social consensus, proximity, probability of effect, concentration of effect, and temporal immediacy.

From another perspective, scholars such as Haidt (2001) and Gibbs (1991) suggested that the moral judgment and ethical decision making are intuitive and sometimes unconscious rather than controlled reasoning processes. Bazerman and Moore (2009) suggested that individuals' moral decision making is bounded ethically, and that they sometimes engage in ethically questionable behaviours that are even inconsistent with their

own preferred values and moral cognitive development. The main reason they offer this type of unethical decision making is the ethical biases at different levels of analysis (e.g. over-claiming credit at the individual and organizational level, in-group favoritism at the individual and group level, and discounting the future) (Bazerman and Moore, 2009).

In the case of evidence-based decision making, ethics is mainly of concern where evidence-based practices may lead to decisions that seem at odds with common morality (Kerridge et al., 1998). For example, in health care decision making, evidence may result in decisions that rationally benefit the population while at the same time may harm the interests of the individual and hence impose an ethical dilemma to the decision maker (Kerridge et al., 1998). The proposed model here suggests that the process of evidence-based decision making is consciously or unconsciously influenced by ethical constraints at different levels, particularly when the decision maker needs to choose the final decision from the generated decision options. For example, research findings suggest that an individual's personal attributes such as religion (Hegarty and

Sims, 1978; McNichols and Zimmerer, 1985), nationality (Hegarty and Sims, 1978; Becker and Fritzsche, 1987; Abratt et al., 1992; White and Rhodeback, 1992), gender (Beltramini et al., 1984; Chonko and Hunt, 1985; Ferrell and Skinner, 1988; Whipple and Swords, 1992) and age (Browning and Zabriskie, 1983; Izraeli, 1988; Callan, 1992) may affect the moral cognitive preferences or intuitive ethical decision making. Individual educational background (Beltramini et al., 1984; Chonko and Hunt, 1985) and personality (Hegarty and Sims, 1978) may also impose ethical constraints at the individual level. Organizational level constraints such as the organization's ethical climate (Ferrell and

Skinner, 1988), size (Weber, 1990), and the level at which the decision is being made (Chonko and Hunt, 1985) also affect the process. Industry ethical standards (Laczniak and Inderrieden, 1987) and the overall level of business environment competitiveness (Hegarty and Sims, 1978) would impose ethical constraints on the final choice at the institutional level.

P6. The process of making a final decision from generated decision options is influenced by ethical constraints at institutional, organizational, and individual levels.

One last issue that needs to be taken into consideration is how constructs at different levels of analysis influence dynamics of the process. For example, the effect of ethical constraints on the decision making process may be impacted by the interaction between several individual and contextual variables (Trevino, 1986). These contextual constructs can either arise from the nature of the decision problem and ethical dilemma at hand or the broader organizational culture (Trevino, 1986). The nature of the ethical dilemma itself or its existence may also vary based on organization's normative structure, responsibility for consequences and other pressures (Trevino, 1986). At the individual level, manager's education, experience, and training may also influence the moderating effect of ethical constraints on the decision making process, mainly because of their effects on manager's moral reasoning and development (Elm and Nichols, 1993; Wimalasiri et al., 1996).

Another interesting interaction effect occurs between the contradictory interests and values of stakeholders across varying levels of analysis. As discussed by Evan and Freeman

(1988), there is no preference of one stakeholder over others defined in the agency theory, and what actually influences the decision making process is a balance between their conflicting values and preferences. This balance may be better understood as a contingent phenomenon as the pressure, power, and influence of different stakeholders may vary due to situational and contextual factors.

P7. The process of evidence-based decision making is influenced not only by the main effects of its constituent constructs but also by the interactive effect of those constructs at individual, organizational, and institutional levels.

2.8. Conclusion

As the preceding discussion suggests, managers need reliable evidence in order to be able to make solid and effective decisions. The theory of evidence proposed in this paper suggests that rigour and relevance of evidence as revealed in its quality and reliability can be assessed on five dimensions: methodological fit, contextualization, replicability, transparency, and scholarly and experts' consensus. The greater their alignment, the stronger is the evidence. We recommend that an independent organization needs to be established to review and evaluate most updated research findings against these dimensions and determine the strength of evidence, based on the degree of overlap between these different dimensions. The result of these reviews need to be at the core of management education and training in order to increase their exposure to best evidence and enhance evidence-based decision making in organizations. However, we also acknowledge that in reality the process of decision making may not be a purely rational process and managers

may perceive and utilize evidence differently based on their experience and judgment. The context in which the decision is being made and the preferences and values of management and various stakeholders of the organization, across different levels of analysis, also influence the process of evidence-based decision making. In addition, there are different ethical at the individual, organizational, and institutional levels that may affect the final choice.

This work contributes to the literature of evidence-based management by clearly defining what evidence is in the field of management and how it needs to be reviewed and evaluated. It also justifies the need for an independent organization for taking over the task of systematically reviewing the research findings and knowledge produced in the management discipline by academics and researchers. Moreover, we propose a multi-stage, cross-level model of evidence-based decision making which provides a comprehensive overview of the decision making process within organizations and takes constructs from different levels of analysis into consideration while acknowledging the interactive effects of these constructs on the decision making process. Its contribution to the practice of management is the framework it offers for achieving a more convergent state of knowledge in the discipline and promoting professionalism by recommending a yardstick for the core body of knowledge that facilitates competent professional practice.

The main limitation of the proposed theory is the absence of empirical work that support the propositions and its heavy reliance on logic and argumentation. This highlights the need for future work testing the theory of evidence, empirically clarifying and operationalizing different evaluation dimensions, and assessing the rigour and relevance of

evidence, based on the degree of overlap between the different dimensions. The model of evidence-based decision making must be tested in order to verify and validate the effect of various constructs on the decision making process from different levels of analysis. Testing this model would also shed light on the usefulness of the proposed collaboration similar to the Cochrane collaboration for the field of management.

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Chapter 3: A Theory of Actionability for Evidence-Based Management: Complementing Rigour and Relevance

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Abstract

Purpose – Our purpose is to contribute to the debate on closing the gap between management research and practice and to offer a solution that will strengthen research evidence for evidence-based management.

Design/methodology/approach – We take a theory building approach to our research. We critically review the literature investigating the research-practice gap including evidence-based management, mode 1 and 2 knowledge generation, design science approaches and action research. We propose a conceptual model to bring rigor, relevance and actionability into greater coherence. We offer a theory of actionability with enabling propositions.

Findings – To narrow the gap between management research and practice, we need to engage in research that, in addition to being rigorous and relevant, is actionable. We propose a sustainable collaboration among the producers, arbiters and users of management knowledge. We provide a theory of actionability that adds value to the design of management research through explicit consideration of, causality, persuasiveness, context, conceptual clarity, operationality, comprehensiveness, and comprehensibility.

Research and practical implications – Our theory of actionability allows management scholars to design research that is of practical value to managers. Our model of rigor, relevance and actionability attempts to bring management academics and professionals on a common platform of evidence-based management. It also promotes collaboration among the key stakeholders of management knowledge. Implications for future research include the development of an actionability index that would help managers judge the actionability of published research and the development of a theory of collaboration that would facilitate the coherence of rigor, relevance and actionability.

Originality/value – We add value to our attempts at closing the gap between management research and practice by going beyond rigor and relevance and proposing actionability as a complementary dimension. We argue that while rigor and relevance are necessary to strengthen research evidence, it is the presence of actionability that makes the research valuable to management practice. To facilitate the incorporation of actionability into management research we propose a theory and expand its articulation through enabling propositions.

Keywords: Actionability, Evidence-based Management, Research-practice gap, Decision making

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3.1. Introduction

The concern that management research has not been extensively successful in impacting management practice has been repeatedly voiced by lead management scholars. In his 1993 Academy of Management (AOM) Presidential Address, Hambrick (1994) argued that while the main responsibility of management research is to be of service to management practice, the field has failed to effectively translate the academically generated knowledge for practical consumption of managers. Bartunek (2003) echoed a similar concern a decade later and encouraged the AOM community to tackle the tension and duality between rigor and relevance in order to bridge the gap between management knowledge and practice. Rousseau (2006) reaffirmed the existence of the divide between management knowledge and practice and suggested that principles of evidence-based practices can help to overcome the issue. Later, Cummings (2007) called for a closer interaction between researchers and practitioners to ensure both rigor and practical relevance of management research-based knowledge.

Addressing the academic-practitioner gap, Bartunek and Rynes (2014) argue that regardless of whether this gap is bridgeable, it warrants theorizing about and investigation. To this end, they outline the main sources of tension between academic and practitioners, including different time constraints, contrasting logics, distinct communication practices, differing interests and incentives, and of course, the challenge of bringing rigor and relevance together. Although we recognize the existence of the issues and agree that studying this gap is interesting and important from a scholarly point of view, we argue that

bridging it is not only interesting from a theoretical standpoint, but necessary for the field of management in order to flourish and make meaningful contributions to practice. We are of the view that management knowledge should ultimately be of service to management practice, thereby enabling managers to make better decisions leading to better organizational outcomes.

Evidence-based management (EBMgt) is an emerging movement that attempts to bridge the gap between research and practice. Driven by the belief that management research can be of more practical value to management practice and enhance the quality of management decisions (Rousseau, 2012), the focus of EBMgt is to disseminate the best available evidence resulting from rigorous and relevant research to practitioners. In this paper we argue that in order to close the gap we have to ensure that the evidence that we offer to the practitioners be not only rigorous and relevant but also actionable. The need to make management research actionable has already been established (Pearce and Huang, 2012a) although there has been no systematic effort yet to develop the notion of actionability as a complement to rigor and relevance. This paper is an attempt to define and develop the concept of actionability, identify its dimensions and put them in a theoretical format.

Apart from the existence of practitioner oriented journals in management, research-generated management knowledge seems to be irrelevant to practice and often ignored by practitioners (Pfeffer and Sutton, 2006). Historically, there has been no meaningful relationship between the importance, validity, and usefulness of many established theories in management (Miner, 1984). While the situation has improved to some extent (Miner,

2003), research reports are, more often than not, solely read by fellow scholars in very narrow communities (Daft and Lewin, 2008, 1990) and not interesting to managers (Deadrick and Gibson, 2009, 2007). This is prevalent in all subfields of business (e.g. Benbasat and Zmud, 1999; Gaffikin, 2008; Robey and Markus, 1998). That said, several general suggestions have been made to enhance the relevance of management research to practice. These suggestions include modifying researchers' compensation system to focus more on end users' value (Vermeulen, 2005) and, to some extent, involving practitioners and other stakeholders in the research process (Gough et al., 2012). Despite such calls, even relevant research has not been able to effectively influence management practice (Rousseau, 2012; Rynes et al., 2002).

The relationship between the rigorousness of research and its practical relevance and whether both can be simultaneously achieved are issues still open to debate. Empirically speaking, research studies have shown both positive (Baldrige et al., 2004; Dunn, 1980; Weiss and Bucuvalas, 1980) and negative (Duncan, 1974; Shrivastava, 1987) relationships between rigor and relevance. Benbasat and Zmud (1999) have suggested that relevant research should be interesting, applicable, current, and accessible. That said, conducting and disseminating rigorous research is time-consuming and consequently leads to publications lacking in currency. Moreover, academic papers require certain skills including knowledge of advanced statistical analysis and an ability to follow the academic writing style. Therefore, from a theoretical standpoint, common research practices aimed at achieving academic rigor seem to have a diminishing effect on practical relevance (Robey and Markus, 1998).

There has been a number of attempts to bring both rigor and relevance into management research including evidence-based management (Hodgkinson and Rousseau, 2009) mentioned earlier. One of the approaches towards resolving the rigor and relevance gap is the idea of putting “Mode 1” and “Mode 2” knowledge production side by side. While “Mode 1” is discipline-based and university-centered which attempts to uncover the truth through positivist approaches, “Mode 2” knowledge production, as an interactive and problem-oriented method, advocates knowledge creation that stems from practice and is validated through implementation (Gibbons et al., 1994). While “Mode 1” seems to be more rigorous, “Mode 2” is perhaps more relevant. Huff (2000) put forward the concept of “Mode 1.5” knowledge production to fuse the benefits of the two modes and avoid the shortcomings. She suggested a knowledge creation method in which research questions rise from and clarified through a close conversation between practitioners and academics. Academic skills and methods are then utilized to collect, analyze, and interpret data and develop generalized frameworks. Another influential insight to resolve this issue came from the “design science” paradigm that advocates taking an engineering approach focusing on what works and what does not instead of focusing on what is true and what is not (van Aken, 2004). It also calls for collaborative research involving both researchers and practitioners (Van Aken, 2004). Action research is another approach that focuses on local problem solving where researchers engage in real life problems solving in organizations and bring back the intelligence to create theoretical knowledge that informs practice (Coghlan, 2011). All of these approaches are viewed as imperfect solutions to the

reconciliation of rigor and relevance and for closing the gap between management research and practice with various critics and operational challenges (see Kieser et al., 2015).

The empirical and theoretical ambivalence between rigor and relevance call for a deeper investigation of our purpose and methods of inquiry. We believe that we should seek a systematic means that can result in a synergistic alignment of rigor and relevance leading to enhanced pertinence of our research findings to management practice. As it stands, much of management research explores organizational and managerial phenomena for theoretical intent and not necessarily to provide practical guidance. In contrast, managers would like to know how to predict and control outcomes of their decisions. This points to a divide between researchers and practitioners beyond what rigor and relevance together can resolve. In order to address this issue and to strengthen the value of management knowledge, we propose actionability as an attribute of management knowledge that complements rigor and relevance. We argue that in order to bridge the gap between academics and practitioners, we need to clearly distinguish rigor as a property of research method, relevance as a property of research topic and the knowledge generated about it, and actionability as a property of the research results pertaining to their usability manifested in the manner in which they are communicated. We develop a theory of actionability guided by an in-depth review of the EBMgt literature and a critical reflection on the best practices of evidence-based medicine.

3.2. The missing link: Actionability

Klein (1971) argues that for something to be considered knowledge, it has to have an acceptable level of validity and be communicated to and recognized by the consumers of knowledge through sufficient evidence. Furthermore, in order to benefit the profession, this evidence needs to be established through relevant research. Ideally, as the central task of managers involves problem solving and decision making, one of the main objectives of research in management is to lead to better decisions (Davenport and Markus, 1999). As a result, similar to professional fields such as engineering and medicine, establishing a realistic and meaningful linkage between theory and practice (Van de Ven and Johnson, 2006) is becoming critical to the survival of the field (Khurana and Nohria, 2008) and the legitimacy of business schools as one of the key knowledge disseminators. However, realistically, research cannot always be readily applicable. This also holds true for research in medicine, physics, and engineering. While it may be true that these fields have access to more stable empirical data compared to management, they too struggle with their own levels of uncertainty and risk of bias. For example, random controlled trials, that are believed to provide the most reliable empirical data in the field of medicine, have limited inference capacity due to flaws in design, conduct, analysis and reporting (Schulz et al., 1995; Wood et al., 2008). What happens though is that even non-actionable pieces of knowledge in these fields are codified and aggregated in such a manner as to be of value to professional practice. Similarly, management research must in due course lead to actionable suggestions. In essence, the value of management research is tightly linked to the degree to which it is actionable (Pearce and Huang, 2012b); without actionability, even rigorous and relevant research will remain unappreciated. Actionability of management research refers

to the extent to which its findings can be implemented in organizations through managerial interventions and decisions (Shrivastava, 1987). Tsoukas and Knudsen (2002) suggest that knowledge is actionable when it succeeds in objectively assisting the relationship between thinking and decision making. Knowledge becomes actionable when theories are summarized and simplified into tools and artifacts that can be directly implemented into practice (Jarzabkowski and Wilson, 2006). Actionable knowledge goes beyond pure rigor and is aimed at empowering managers to make research-informed decisions with a higher probability of success. By increasing the overlap between rigor, relevance, and actionability of management knowledge(Figure 3-1), the field can aspire to a higher state of professionalism and enable more rapid, effective, and relevant scholarly advancements. This overlap is achievable through unbiased and systematic accumulation and synthesis of relevant and quality appraised pieces of evidence through a collaborative mechanism that includes key stakeholders of management knowledge such as researchers, educators, journal editors, consultants, and managers. Therefore, we propose that:

P1. The practical value of management knowledge is enhanced through the fusion of rigor, relevance, and actionability through a collaborative mechanism inclusive of its main stakeholders.

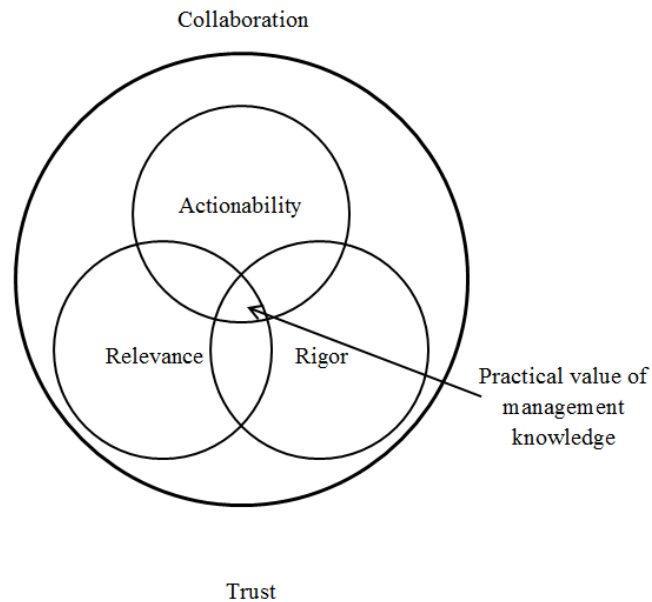


Figure 3-1- Practical value of management knowledge

In order to make the fusion of rigor, relevance, and actionability possible, we need to define the characteristics and attributes of the final product of the proposed collaborative mechanism. In order to address the challenge of producing actionable knowledge through research, we expand on Pearce and Huang's (2012a) definition of actionable research and propose a theory of actionability. Our theory suggests a framework for identifying and assessing actionability, and offers a guideline for generating actionable research that can be practically valuable to managers. Actionable research can be symbolic, instrumental, and/or conceptual (Pelz, 1978). Symbolic research refers to that which decision makers present in order to persuade others of the effectiveness of a decision. Instrumental research is identified as research that is directly used in a decision process. Conceptual research shapes decision makers' understanding of a phenomenon and cognitively empowers them in the decision-making process. In their study of assessing the gap between management

research and practice, Pearce and Huang (2012a) argued that actionable research has both instrumental and conceptual utility but did not identify facets of actionable research that contribute to its instrumental and conceptual utility. This calls for theoretical elaboration on the facets of actionability leading to a theory of actionability (Figure 3-2):

P2. Research is actionable when it is variously causal, contextual, conceptual, comprehensive, operational, comprehensible, and persuasive. The more these components fuse together, the more actionable the research is. The fusion can be achieved through establishing trust and collaboration among producers, arbiters, and users of research knowledge and through the resulting systematic reviews that are accessible at the time of decision making, thereby facilitating evidence-based management.

In the following section we elaborate on the different attributes of actionability and clarify them through examples.

3.2.1. Causality

Causality refers to the extent to which research findings can establish cause and effect relationships. Practicing managers strive to increase the probability of achieving desired results through their decisions; therefore, management research is valuable to practice if it demonstrates a causal relationship between their decision and the resulting consequences. This causal reasoning is central to practicing managers' cognitive process in decision making (Pearl, 2000). Unlike the natural sciences where the objective of research is to understand and/or predict events, managers need knowledge that enables

them to control events (Gouldner, 1957). For example, while it is useful to know that trust in leadership can positively affect group performance (Dirks and Skarlicki, 2004); in order for research to be actionable, managerial interventions that result in higher interactional and procedural justice and hence greater trust in leadership must be specified.

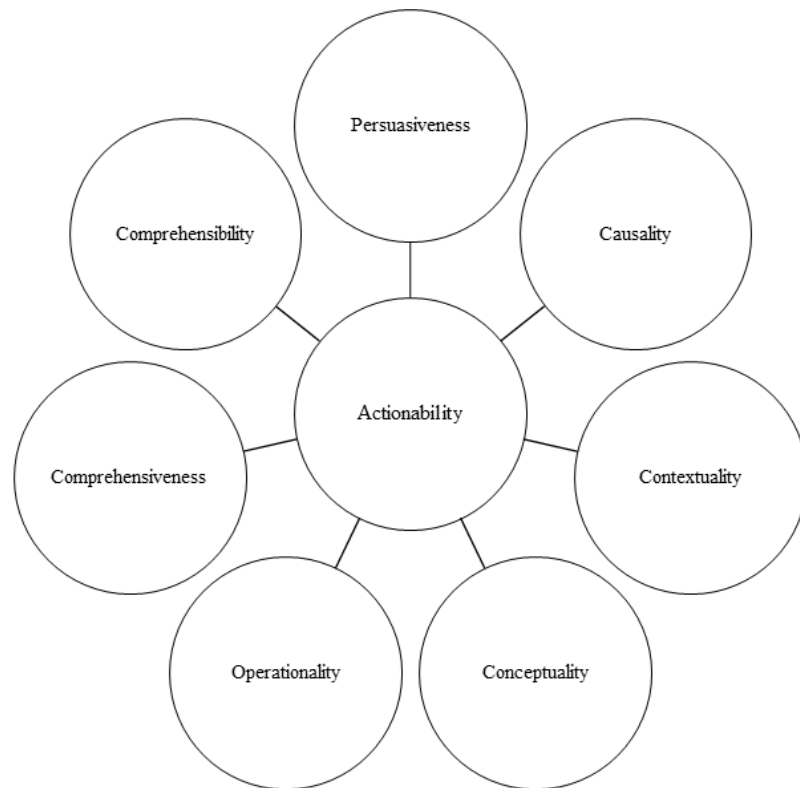


Figure 3-2- Theory of actionability

The importance of establishing cause-effect relationships in research and its centrality to understanding organizations and managerial decisions has been repeatedly emphasized in the literature (e.g. Argyris, 1996; Durand and Vaara, 2009; Gregor and Hovorka, 2011; Huff and Jenkins, 2002). Nevertheless, many published studies merely report information rather than provide actionable knowledge, and often present results that are more meaningful to academics than to practitioners (Christensen and Raynor, 2003).

This is not to suggest that studies that report correlational relationships are not of value in advancing knowledge in management; rather, theories and studies need to eventually establish causal relationships between their components to enable managers to predict and control outcomes. Even studies that are focused on action merely recommend mimicking best practice based on case studies and success stories. Research techniques that focus on establishing causality according to the paradigm of design science (Denyer et al., 2008), longitudinal research strategies, and other research methods for advancing management knowledge should be reinforced and finding a common ground between researchers and practitioners should be encouraged. Therefore we propose that:

P3. In the context of evidence-based management, evidence is more actionable when it demonstrates a causal pathway between a managerial decision and its consequences.

3.2.2. Contextuality

Contextuality refers to research process and report that attend to circumstantial, environmental, and/or target population characteristics. For the past half-century, management research has focused on the importance of context in understanding and investigating organizational phenomena (Johns, 2006). Actionable research is a story best narrated by context and data (Cao et al., 2007). Basically, managers are not only interested in knowing whether a decision can lead to desired results, but also how effective an intervention would be in their unique circumstances. Without context, data cannot be interpreted and pragmatic knowledge cannot be claimed. For example, many interventions aiming to influence individual behavior are contingent on personality, values, social-

normative factors, and so forth. Bamberger (2008) has suggested that in order to fully grasp the contextual factors and their influence on the issue under investigation, researchers need to go beyond merely acknowledging the existence and importance of contextualization and use the domain-driven contextualization theories and frameworks to explicitly identify and study situational variables and their interactions. This approach leads to more actionability of management research as it allows managers to not only obtain a better understanding of the problems they encounter and the factors contributing to them, but to also better translate research conducted in an environment and context different from their unique organization and circumstances. Therefore we propose that:

P4. In the context of evidence-based management, evidence is more actionable when it identifies relevant variables in the context and documents their impact on a managerial decision.

3.2.3. Conceptual clarity

Conceptuality of management research fosters a deeper understanding of the phenomenon the manager is dealing with. The conceptual clarity of research helps managers better understand the reasons behind a problem and the mechanism through which it can be resolved. Facing the complexity and uncertainty of organizational problems, the rationality of decision making is bounded by constraints to knowledge, judgment, and time (Gigerenzer and Selten, 2002). However, within these boundaries, managers still intend to behave rationally (Grundvåg Ottesen and Grønhaug, 2002) and therefore seek to consciously analyze their environment, detect existing problems, and identify relevant facts and information in order to solve them. Research is actionable when

it enables this cognitive processing by providing explanation on why and how something occurs. Many managerial research and theories help managers better understand the problems they face. While understanding a problem is only the first step in solving it, it is a very important one. Understanding theories help managers classify and categorize their observations, attribute meaning to and interpret them, and more effectively communicate their perspective with others inside and outside their organizations (Zaltman et al., 1982). This conceptual understanding can be delivered by providing a short description of the supporting theories in research reports. This helps managers form a mental model through which they can organize the information they receive from the environment into structured patterns. A logical mental model enables decision makers to understand and design complex systems of decisions with regards to organizational problems (Cannon-Bowers et al., 1993). Therefore we propose that:

P5. In the context of evidence-based management, evidence is more actionable when it is clear as to why and how factors leading to a decision relate to each other.

3.2.4. Operationality

Operationality refers to the action-orientation characteristics of research that actually make research pragmatic with direct implications for practice. Operationality is one step beyond conceptuality and understanding problems. It is about framing a course of action and intervention to address those problems. Applied research should make explicit recommendations regarding managerial practice based on organizational aspects that managers can influence. It is about giving managers the ability to control events and

outcomes. Operationality stipulates that research should be cost effective and provide information on how to measure the cost of implementing the decision and its probable outcomes.

For example, through empirical research we know that one of the main reasons employees intend to leave an organization is that they are not satisfied with their jobs or the firm (Arnold and Feldman, 1982). Research also suggests that commitment mediates the relationship between satisfaction and turnover (Williams and Hazer, 1986). When an organization faces high turnover rates, this research would acquire operational value if the manager could determine which tools are necessary to measure commitment and satisfaction, how employee satisfaction can be increased, and through what practices satisfied employees become committed. Therefore we propose that:

P6. In the context of evidence-based management, evidence is more actionable when its parameters are operational and facilitate decision making and implementation.

3.2.5. Comprehensiveness

Organizations are complex entities with different interactional relationships across all levels. Moreover, they are open systems intertwined with other organizations, industries, and a broader socio-economic environment. Actionable research needs to acknowledge the complexity and dynamic nature of a decision process and offer a comprehensive understanding of organizational phenomena. Achieving such level of comprehensiveness in research is possible by adopting a dynamic model of decision making in which a series

of dependent decisions (Brehmer, 1992) is required to approach organizational problems. Such research can help decision makers determine if the benefits outweigh the potential harms of their actions (Van Tulder et al., 2003). For example, according to goal setting theory, a widely replicated and empirically supported theory in management, challenging and specific goals boost performance (Locke and Latham, 1990). However, by overprescribing or through partial and careless implementation of goal theory practices, individuals and organizations may suffer from systematic side effects such as negligence to non-goal areas, increase in unethical behavior, biased risk preferences, and even reduced intrinsic motivation (Ordóñez et al., 2009). Actionable research on goal theory would present decision makers with an overall view of the chain of events and decisions that would stem from implementing goal theory practices.

In particular, system thinking has been recommended as a conceptual framework that effectively captures interrelated aspects of complex managerial decisions. System-thinking is a problem-solving approach that enhances understanding of different problem-related phenomenon by considering a problem in its entirety and explaining causal relationships between its different parts (Rubenstein-Montano et al., 2001). A system-thinking framework for research in management can be particularly effective as it brings to light certain properties of a problem otherwise overlooked when a problem is defined and formulated in isolation. In most cases, such comprehensiveness is beyond the scope of a single study. Researchers can, however, acknowledge the interconnectivity of their models to other models and theories and provide a general understanding of the relationships not

directly covered in their research in order to gradually accumulate and synthesize research results and form integrative theories and models. Therefore we propose that:

P7. In the context of evidence-based management, evidence is more actionable when it incorporates the complexity and dynamics of the decision process toward a comprehensive understanding of organizational phenomena.

3.2.6. Persuasiveness

Persuasiveness of actionable research denotes its soundness and thereby its ability to convince. We propose that actionable research should not only be conducted in a rigorous manner, but should also have face validity and demonstrate its rigor to persuade its users. To claim convincing results, actionable research should provide high quality arguments and evidence. Therefore, actionable research can only be achieved through synthesizing results of various studies in different settings in order to decrease the effects of measurement error, sample size, and other sources of bias. Furthermore, for generating actionable knowledge, research findings need to be evaluated and graded according to an agreed upon framework capable of assessing each study's validity and reliability, or in other words, the strength of the evidence. In management, one such framework, suggested by Shrivastava and Mitroff (1984) assess rigor and relevance of research evidence on aspects of conceptual adequacy, methodological rigor, accumulated empirical evidence, meaningfulness, goal relevance, operational validity, innovativeness, and cost of implementation. However an integrative mechanism to bring all these dimensions to cohere is not offered. Furthermore, innovativeness does not appear necessary for defining the strength of evidence. Another grading framework, based on the Theory of Evidence (Baba and HakemZadeh, 2012),

proposes a more generalizable perspective and argues that research evidence is of higher quality and strength when it is derived from aggregating and synthesizing results of studies that are based on suitable research methods that are transparently documented, validated through replication, reporting detailed analysis of contextual factors, and resulting in a high degree of consensus among academics and experts. Therefore we propose that:

P8. In the context of evidence-based management, evidence is more actionable when it demonstrates validity and persuades the decision maker.

3.2.7. Comprehensibility

Comprehensibility of research refers to how understandable it is to its users. Research findings cannot be applied in practice if they are not understood. Therefore, for knowledge to be actionable it should be generated according to the needs and preferences of its target audience. If not, research will remain only within the academic domain. Most often, research findings are reported in academic papers using technical language not easily accessible to non-research-trained users (Last, 1989). Kezar (2000) has suggested that practitioners prefer web accessible, easy-to-read, short summaries of research reports.

In order to realistically achieve a state of knowledge that is rigorous, relevant, and actionable, and in order to increase the overlap between the three facets of management knowledge, we must design a knowledge production system that can effectively and sustainably facilitate such operation. The evidence-based management literature suggests various solutions to the challenges that the discipline faces with regards to the gap between

management research and practice. It is time for an intervention that can actually put the suggested remedies to work (Gladwell, 2006). Therefore we propose that:

P9. In the context of evidence-based management, evidence is more actionable when it is readily understandable by the decision maker and those impacted by the decision.

3.2.8. Strengthening the evidence

While each of the dimensions of actionability contributes to making the evidence actionable, they do so uniquely. It is possible for evidence to show strong causal links between a decision and its outcome without necessarily being anchored in the right context. Likewise, while the evidence can be comprehensible, it may not necessarily be operational. Though the evidence has clarity in what it offers, it may not altogether be persuasive. In other words, in order for actionability to be robust, all of the dimensions have to be present in the research. Such co-occurrence has to be consciously planned at the time of asking the research question and designing research. It can be strengthened by an ongoing collaboration among the producers, arbiters and users of the evidence. It can be sustained through establishing trust among the collaborators. Therefore we propose:

P10. The evidence is stronger to the extent to which the dimensions of causality, contextuality, conceptual clarity, operationality, comprehensiveness, persuasiveness, and comprehensibility are consciously factored in the research.

3.3. Pathway to actionable knowledge: The Collaboration

Generating actionable research and simultaneously creating rigor, relevance, and actionability is not without its challenges. Researchers in management and its subfields have little incentive for pursuing relevance and their research topics are generally based on personal interest or theoretical gaps in literature. Moreover, in the current system of peer review, they themselves are the sole judges of rigor (Judge et al., 2007). Moreover, while authors are required to write about the possible implementations of their research, no feedback or study of the effectiveness of their claims is required. Unlike in medicine and engineering, management researchers cannot evaluate the implementability and effectiveness of their recommendations in a controlled test condition (Kieser and Nicolai, 2005). Hence the system of knowledge production seems to be closed and autonomous social system and as it stands there is no regular flow of communication between practice and research in management and the promise of collaborative research, as called for by action research and mode 2 knowledge generation, is in vain (Kieser and Leiner, 2009).

Adding to the dilemma is that while the peer review process is not dispensable (Kassirer and Campion, 1994), it still cannot guarantee rigor (Jefferson et al., 2002). Moreover, management knowledge that never goes through the peer review process and is produced by management consultancies, governmental institutions, and other for-profit and not-for profit organizations is often ignored by academics. Management practitioners and researchers are trained differently, have their own unique jargons, and operate according to dissimilar value systems.

We argue that the challenge of closing the gap can be better tackled through an independent institution that facilitates the collaboration between the two very different

social systems of management research and practice. This organization can systematically define questions that are relevant, gather related knowledge generated at different sites, appraise their rigor, and synthesize them into actionable reports that are short and easy to read. Moreover it can provide the infrastructure for effective dissemination of knowledge to different users and communication between different stakeholders by utilizing knowledge brokers. The idea of such an organization, called the Collaboration, has already helped the fields of medicine and policymaking to close the gap between research and practice.

It is important to also point out that trust in research processes and organizations and individuals involved in them is an important indicator of research actionability; an independent collaboration trust affects practicing managers' perception of the level of certainty surrounding the results and hence influences their intention to implement them (Moorman et al., 1992). Establishing a trustworthy independent institution responsible for assessing, synthesizing, and reporting research evidence to decision makers will serve this purpose. Therefore we propose:

P11. The actionability of management research is sustained by an established collaboration and enhanced by trust among the producers, arbiters, and users of evidence.

Rousseau (2007) puts forward the idea of an Evidence-based Management Collaboration (EBMC) that can smooth the progress of evidence-based management through close collaboration between researchers, educators, and practitioners in order to establish a body of evidence for the field of management and effectively disseminate it to

different users. In a collaborative approach to knowledge production, the collaboration encourages practitioners to communicate their concerns and research topics of interest to the Collaboration, which will vet and pass on that information to funding agencies and researchers. The Collaboration may also conduct its own research for identifying relevant topics of practical value. In addition, EBMC can manage the dissemination of research findings by communicating practitioners' interests to journal editors, educators, and media. They can also play a role in regulating the curriculum business schools use toward actionability and evidence-based management in order to standardize the quality of education and training required for management professionals. The Center for Evidence-based Management (CEBMA) has already begun the process of bringing the producers and users of management knowledge together. However work needs to be done toward developing a permanent collaboration such as the Cochrane collaboration for medicine or the Campbell collaboration for policy.

The authority of such collaboration emerges from its expert power and whether it can deliver knowledge that is more useful to the management professional community. Similar authority exists for both top journals and prestigious conferences in the field as they are the gatekeepers of what gets published and disseminated. By no means would the collaboration be able to halt one's interest in research. EBMC cannot dictate which topics get funded, but it can recommend a list of priority research topics that are in high demand among managers, SMEs, governmental agencies, large corporations, management consultancies, and so forth. Identifying these topics and areas of research should not be based on the personal preferences or estimations of a few individuals, but rather on what is

sought by the end users. The collaboration will be responsible for conducting relevant research that will identify research topics based on evidence that is more urgently required. The reality is that research in other professional disciplines is conducted based on questions that are of interest to the industry leaders (e.g., engineering), or identified as critical by respective ministries and agencies (e.g., health care and medicine). A database of all scholars, their area of expertise, and ongoing studies can facilitate establishing short-term collaborative groups on different topics. This collaboration also requires sophisticated data management, collaborative software, and various tools to evaluate an individual study's quality of evidence and risk of bias. The ultimate outcome of these collaborations are regularly updated Systematic Reviews (SR) that can guide both practice and future research.

3.4. Discussion

Tackling the issue of research-practice gap should be defined as a collaborative action. The scope of the operation needed in order to achieve this goal is certainly complex and beyond one single paper. However, one basic stepping stone in evidence-based management is the development of a yardstick to evaluate the strength of the available evidence. Most reliable and rigorously generated pieces of evidence should then be transformed into an actionable whole. This process has its own challenges: the characteristics of the final knowledge product should be clearly defined, and the definitions should then be operationalized and agreed upon by the producers, gate keepers, and end users of management knowledge. New dissemination channels should be created and

existing ones should be modified. This is best done with theoretical guidance—that is, theories of evidence, actionability, and collaboration. Baba and HakemZadeh (2012) have offered a theory of evidence. We have proposed a theory of actionability to facilitate this process. Taking into account the context and the unique nature of management practice, we have identified seven attributes of actionable knowledge namely causality, contextuality, conceptuality, comprehensiveness, operationality, comprehensibility, and persuasiveness. We have also suggested that these attributes be integrated in research through collaborative efforts among all the stakeholders involved in the production, dissemination and utilization of management knowledge. It is only through such collaboration that we can increase the area of overlap between rigor, relevance, and actionability, and provide management practice with consumable knowledge that can lead to higher quality decisions with a greater probability of effectiveness. This work contributes to the literature on management knowledge production and evidence-based management by offering a theory of actionability and a framework for collaboration. There is more work to be done. The theory of actionability needs to be empirically verified. The notion of collaboration requires theoretical development. In essence, our attempt to make management research rigorous, relevant and actionable sets the stage for further empirical and theoretical work that will eventually pave the way toward the implementation of evidence-based management.

3.5. Conclusion

Bridging the research-practice gap should be on the agenda of management scholars as the sustainability of business schools and management research is closely linked to their

contribution to management practice through a body of knowledge that can enhance decision quality. The notion that achieving more rigor and relevance would enable management research to establish a closer link to practice is hard to argue with. They are indeed necessary but not sufficient. We argue that in addition to rigor and relevance, management research needs to be actionable in order to have practical value. We believe that with a clear definition of actionable knowledge and its attributes, we can design a knowledge production system that can systematically create and codify knowledge that is rigorous, relevant, and actionable.

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Chapter 4: Measuring the Actionability of Evidence for Evidence-Based Management

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Abstract:

Purpose – This study addresses the gap between management research and management practice by suggesting that, in addition to rigor and relevance, management knowledge should be actionable to be of practical value. To this end, an index for evaluating actionability is proposed and empirically tested.

Design/methodology/approach – Based on a theory of actionability and a critical and reflective review of both evidence-based management and evidence-based medicine literatures, we developed 40 items that would best represent attributes of actionable research. We asked 187 management scholars, members of the editorial boards of influential management journals, and practicing managers to rank the extent to which each item was important to their perceptions of research to be actionable in practice. We treated actionability as a two level construct consisting of first-order reflective factors and second-order formative ones.

Findings – Using Principal Component Analysis with Varimax rotation six factors were extracted, explaining 68% of variance in actionability: (1) operationality, which also included items from causality, (2) contextuality, (3) comprehensiveness and persuasiveness, which split into dimensions of (4) rigor, and (5) unbiasedness, and lastly (6) comprehensibility. Using Partial Least Squares Analysis, we demonstrated that these six factors formatively contribute to an overall index of actionability of management research.

Research Implications – The index offers an empirical measure to advance research on evidence-based management by facilitating theory testing in different management contexts.

Practical implications – The developed index promotes evidence-based management by providing producers, disseminators, and users of management knowledge with a metric to appraise actionability of management knowledge.

Originality/value – This index is the first theory-based and empirically tested tool for effectively evaluating the practical value of management research.

Ph.D. Thesis – Farimah HakemZadeh; McMaster University – Business (MOBHR)

Keywords – Evidence-based practice; management techniques; management research; actionability; formative measurement model

Paper type – Research Paper

4.1. Introduction

More than a decade ago Pfeffer and Fong (2002) questioned the relevance of management scholarship to management practice and warned that business schools are failing to make an effective contribution to management education and practice. Empirical evidence supports the claim that there is a lack of meaningful connection between research and practice (e.g. Miner, 1984; Rynes, Colbert, and Brown, 2002; Tucker and Lowe, 2012). Evidence-based management (EBMgt) is an attempt to bridge the gap between knowledge and practice by generating research that is meaningful and useful to management practitioners (Briner and Rousseau, 2011; Pfeffer and Sutton, 2006). This has resulted in various suggestions such as using complementary research methods in strategy studies to better understand the complexities of organizations (Balogun, Huff, and Johnson, 2003), increasing rigor and relevance through conducting experiments in real organizational settings and collaborating with practitioners in the conduct of research with the emphasis on implementation (Eikeland, 2006; Nielsen, Lennart, and Lennart, 2006), and generally promoting engaged scholarship (Van de Ven, 2007). While some argue that the gap cannot be bridged due to practitioners and researchers seemingly living in two parallel worlds with no common ground in terms of logic, purpose, and language (Kieser and Leiner, 2009), others suggest that the gap is not only bridgeable but is already narrowing to some extent as a result of collaboration between researchers and practitioners (Hodgkinson and Rousseau, 2009). It is worth noting that most of the literature on how to close the gap between research and practice tend to be normative (Kieser, Nicolai, and Seidl, 2015) and

there is a need for theoretically backed empirical studies exploring mechanisms for closing the research-practice divide.

In this paper we argue that management should be treated as any other professional field where the ultimate objective is to inform practice by generating knowledge that is critical as well as useful to the profession. Such knowledge can be incorporated in professional education and training contributing to the enhancement of quality in managerial practice. Extant literature on this subject has long recognized the need for rigorous research that is also relevant to management practice (e.g. Baba & HakemZadeh, 2012; Gulati, 2007; Pierson, 1959; Rousseau, 2006; Shrivastava, 1987; Vermeulen, 2005). Generally, relevance to practice is embedded in the research question and speaks to its pertinence to the setting (Vermeulen, 2005). To be relevant, the research question should ideally come from practice, and data should be obtained from real organizational and market settings (Kelemen and Bansal, 2002; Usunier, 2006). Rigor reflects the soundness of research method and the degree to which the decision maker can trust the recommendations (Vermeulen, 2005). To be rigorous, research should use valid and reliable instruments to measure the constructs of interest (Eisenhardt, 1991), and focus on the population that is best suited to produce valid results. There is already an established body of literature dealing with rigor in our research (e.g. Gibbert, Ruigrok, and Wicki, 2008; Seuring, 2008; Terpstra, 1981), pursuit of its relevance to management practice (Beyer and Trice, 1982; Kieser & Nicolai, 2005; Thomas and Tymon, 1982) and ways to bring them together in one piece of research (Kieser, Nicolai, and Seidl, 2015). The relationship between rigor and relevance has long been the source of controversy. On one

side is the argument that bringing rigor and relevance together is possible through research paradigms such as design science (Romme, 2003; Romme and Endenburg, 2006; van Aken, 2004; van Aken, 2005), action research (Coghlan, 2011; Levin and Greenwood, 2001; Reason, 2006), and mode 2 knowledge generation (Huff, 2000; MacLean, MacIntosh, and Grant, 2002; Mohrman, Pasmore, Shani, Stymne, and Adler, 2008). Evidence-based management (Briner, Denyer, & Rousseau, 2009; Denyer, Tranfield, & van Aken, 2008; suggests that a systematic synthesis of research studies on a certain topic appraised for their quality would better help to bridge the gap between research and practice and treats the former research paradigms as ways to produce evidence. Evidence-based management seems to be inclusive of other paradigms as research based on design science, action research, and mode 2 knowledge generation can all be graded using a theoretical yardstick for evidence (Baba & HakemZadeh, 2012) and integrated in systematic reviews. On the other side is the argument that rigor and relevance are essentially incompatible and our methods of inquiry lead to an inevitable tradeoff between the two (Kieser & Nicolai, 2005). We also want to highlight that even on topics where rigorous and relevant research is available, research shows that the gap between research and practice prevails (Rynes, Colbert, & Brown, 2002). This leads us to think that apart from rigour and relevance, the research-practice gap may depend on another variable, namely actionability. We believe that attention to the actionability of research will enhance the value of both rigour and relevance to the practicing manager.

Actionability, is concerned with how applicable the research is and how readily implementable the research outcomes are (Pearce and Huang, 2012). Although relevance

and actionability are sometimes interchangeably used in literature, there is a clear *difference*. While relevant research helps to explain and predict a phenomenon of interest to a decision maker, actionable research enables the decision maker to create and control outcomes (Argyris, 1996). Relevance is necessary for making a good decision but not sufficient for its implementation.

Senge states that management knowledge has to have the capacity for effective action (McKelvey *et al.*, 1999). It is suggested that this capacity for action stems from guidelines that can be used directly by decision makers (Ratner & Riis, 2014). Others argue that unless a piece of research eventually leads to actionability it does not make any contribution to the field (Martin, 2012). Despite growing demand for actionable knowledge in management, there is insufficient guidance in the literature as to its contents and production for its producers, arbiters, and users (Pearce & Huang, 2012). Without adequate probity on what makes research actionable, it is difficult to bridge the gap between research and practice in management. As we have stated earlier, in order for management practice to be effective, it has to be based on the best available evidence. We argue that the best available evidence has to be rigorous, relevant and actionable. Our goal is to contribute to the growing literature on evidence-based management for closing the research-practice gap. Our strategy is to complement rigor and relevance with actionability and develop a metric to assess the actionability of management research. This index will enable researchers to identify the actionability of their research findings for management practice and will allow practitioners to assess the actionability of the recommendations stemming from research. The objective of actionable research is not to provide decision makers with

definitive answers to managerial problems but rather to expose them to an array of available and actionable knowledge. In any particular decision-making situation, decision makers judiciously and critically evaluate and combine the best available evidence generated through research with information and evidence from their local context to make the best decision under the circumstances (Pfeffer and Sutton, 2006). The decision options are therefore a function of the available evidence and managers' own knowledge and experience (Baba and HakemZadeh, 2012). These options are further filtered based on the needs and preferences of the decision makers and other stakeholders.

4.2. Definition and theoretical foundation

Actionability of management research is defined as the extent to which research findings can be implemented in organizations through managerial interventions and decisions (Shrivastava, 1987). Implementation of research into practice can take several forms. Research can be utilized *symbolically* in practice when research findings are used at the end of the decision process, more as a formality, to support and justify the decision (Pelz, 1978). In such circumstances, research findings are selectively identified and reported (Weiss, 1979). Management theories and research also have *conceptual utility* as they shape the way managers observe and analyze problems. It helps them explain their decision to others. In addition to symbolic and conceptual utility, research has *instrumental utility* when the results are directly fed into the decision process to help the manager investigate a current situation, predict a desired state of affairs, and identify viable options to pursue (Nicolai and Seidl, 2010). Pearce and Huang (2012) attempt to identify key

management journal publications that are conceptually and instrumentally useful for practitioners. However there is ambiguity in identifying what is considered actionable and why. This requires unpacking actionability to its constituent elements. Drawing from previous research on related constructs such as implementation (Beer, 2001), workability (Levine and Greenwood, 2001), and utilization (Kieser, Nicolai, and Seidl, 2015) and the available literature on practically useful research reports, we identify as *operationality*, *causality*, *contextuality*, *comprehensiveness*, *persuasiveness*, *comprehensibility*, and *conceptuality* as possible attributes of actionable research. These characteristics have to cohere to make the research outcome actionable. To ensure such coherence we need a mechanism that combines the results of studies that are carefully selected, quality appraised, and deemed relevant. Systematic Review is an established research method that synthesizes results from various studies into one comprehensive report (Denyer and Tranfield, 2009). The underlying logic of these reviews maintains that statistical and research design limitations due to sample size and bias in individual studies can be overcome by combining studies (Mulrow, 1994). Systematic reviews differ from other forms of reviews in their purpose, evaluative nature, and reporting method (Briner and Walshe, 2014).

As the notion of actionability forms the foundation for this study, a brief explanation of the facets of actionability and the supporting literature is in order.

Operationality. Research is not considered actionable unless it makes pragmatic recommendations that can be readily implemented in practice. Operational research

outlines managerial intervention through which managers can create and control events within their organizations. Operationality also demands that the recommended courses of action are legal and cost effective. For example, nearly all organizations are interested in increasing the knowledge, skills, and abilities (KSA) of their employees, thereby empowering them to work towards achieving organizational goals, and motivating them to do so. However, simply conveying this concept does not make it operational as it does not identify specific managerial interventions that can increase KSA and empower or motivate employees. Research on high performance work systems takes this theoretical framework to the operational level by specifying how self-managed teams (Chaston, 1998), flexible job designs (Baltes, Briggs, Huff, Wright, and Neuman, 1999), performance appraisal (Delery and Shaw, 2001), selectivity in staffing (Hoque, 1999), and training (Pfeffer, 1998) can achieve these outcomes. So we argue that evidence is more actionable when its parameters are operational and facilitate decision making and implementation.

Causality. Actionability is concerned with decision makers' ability to predict outcomes more accurately and create desired results through managerial interventions. Therefore, establishing a cause and effect relationship between managerial practices and their consequences is essential. It calls for knowledge that explores causality at both theoretical and empirical levels. For example, it is suggested that typological theories that explain the relationships between decisions, context, and organizational characteristics can better demonstrate cause and effect relationships (Fiss, 2011) and integrate organizational complexities in their conceptual framework. In the empirical domain, it has often been argued that cross-sectional studies have limited capacity for establishing causal inferences

(Flanders, Lin, Pirkle, and Caudill, 1992). Research designs such as longitudinal studies (Rindfleisch, Malter, Ganesan, and Moorman, 2008), action research (Baskerville and Wood-Harper, 1996), and mode 2 knowledge production strategies (van Aken, 2005) are better at establishing causality in management research. As a result, we suggest that systematic reviews will have more practical value if they focus on studies that provide evidence on causality. So we argue that evidence is more actionable when it demonstrates a causal pathway between a managerial decision and its consequences.

Contextuality. In about any field of science, context defines the conditional factors under which a theory may or may not be valid (Rousseau and Fried, 2001). Type of managerial problems, viability of decision options, and their effectiveness are greatly affected by various contextual factors, such as organizational culture, industry, economic favorability, and employee type, to name a few. Research is only actionable if it is able to incorporate the effects of these contextual factors on the decision and decision outcome or provide decision makers with a framework of context according to which effectiveness of different interventions can be evaluated. Most management theories are contingent, and without context specification they cannot be properly interpreted and utilized (Cao and Zhang, 2007). It should also be emphasized that context is a field-specific phenomenon. For example, in organizational behavior, actionable research incorporates context in terms of task, social, or physical characteristics (Johns, 2006). In other fields of management, practices are contingent on contextual factors such as environmental uncertainty, customer power, decentralization, size, advanced manufacturing technology, total quality management, and availability of timely information (Abdel-Kader and Luther, 2008). And

in making decisions with regards to launching an R&D initiative, actionable research should consider relevant contextual factors such as nature of the innovation, market, and technology (Balachandra and Friar, 1997). Consequently, we argue that evidence is more actionable when it identifies relevant variables in context and documents their impact on managerial decisions.

Comprehensiveness. Organizations are complex entities in which different departments and functions are interconnected and many organizational phenomena have dynamic non-linear relationships rather than static linear ones (Cooksey, 2001). Moreover, organizations are open systems where input and output are influenced by the environment and other organizations. The complex cause and effect relationships between these different factors create a network of interrelated events. Each single managerial decision results in a series of changes inside and outside an organization, often beyond the intended outcomes of interest (March, 1994). Due to this complexity, organizational research and practice use various conceptual frameworks through which organizations are observed and managerial problems are formulated, theorized, and solved (Flood and Romm, 1995). In order for research to be actionable it should be sufficiently comprehensive to successfully capture and manage the state of this complexity and diversity of knowledge. A level of comprehensiveness that can provide a wide enough lens to study a phenomenon cannot be established in one single study. Systematic reviews would be more likely to achieve an actionable level of comprehensiveness through a critical synthesis of the results of several studies appraised for their quality (Petticrew and Roberts, 2006). Hence, we argue that

evidence is more actionable when it incorporates the complexity and dynamics of the decision process toward a comprehensive understanding of organizational phenomena.

Persuasiveness. In order for research to be actionable, decision makers should be able to trust its quality and believe in its validity. Generally speaking, a recommendation is more persuasive to its audience when it is accompanied by some form of evidence (Hornikx, 2005). Therefore, the quality and rigor of the evidence presented in research is critical to the degree to which it is actionable. Empirical research shows that decision makers have more trust in statistical and causal evidence as opposed to narrative evidence (Allen and Preiss, 1997; Hornikx, 2005). This aspect of actionability is particularly important as the credibility of the evidence directly affects managers' intention to implement recommendations and influences the quality of the final decision (Nicolaou & McKnight, 2006). To that end, we argue that evidence is more actionable when it demonstrates face validity and persuades the decision maker.

Comprehensibility. Research can only be successfully implemented if decision makers understand it easily. Excessive use of technical language and limited accessibility to research papers make it more difficult for non-academics to obtain the best available evidence (Last, 1989). Short, easy to read research reports would increase the probability of research being applied in decision making (Kezar, 2000). Therefore, we argue that evidence is more actionable when it is readily understandable by the decision maker and those impacted by the decision.

Conceptual clarity. Managers must understand the concepts that inform their reasoning. Research becomes actionable when it facilitates the cognitive process involved in decision making. The conceptual value of research stems mainly from its theoretical foundation and whether it explains why and how certain managerial practices result in certain outcomes of interest. This attribute offers a logical mental model to managers according to which they would be able to organize their observations, look for additional data or research, formulate their problems, and develop decision options (Cannon-Bowers, Salas, and Converse, 1993). Despite the fact that decision making is not always purely rational and is often bound by various perceptual biases and other constraints (Gigerenzer and Selten, 2002), research can lead to action when it provides a logical cognitive map that simplifies different steps of problem solving into manageable frameworks. Therefore, we argue that evidence is more actionable when factors leading to a decision clearly relate to each other.

Taking it all together we make the following assertions and test them empirically. Our ultimate purpose is to formulate an index of actionability that facilitates the assessment of evidence in evidence-based management.

There are seven distinct dimensions of actionability of management research: operationality, causality, contextuality, comprehensiveness, persuasiveness, comprehensibility, and conceptuality.

Each dimension contributes variously to an overall construct of actionability of management research.

4.3. Method

Given that our ultimate interest is in developing an empirical index, we examined the development of indices in other evidence-based practices. In particular, we patterned our study after the PRISMA study (Moher, Liberati, Tetzlaff, Altman, and The PRISMA Group, 2009) that created the influential template for systematic reviews in medicine. In June 2005 the PRISMA group held a three-day meeting to collectively define the characteristics of a research report that can be useful in practice. The participants consisted of authors, methodologists, clinicians, journal editors, and a customer. They were provided with a checklist of items considered useful for generating practically valuable knowledge and were then asked to identify only essential items. We expanded on their approach by first basing the proposed index on a theory of actionability (HakemZadeh and Baba, 2015). We then sought the help of field experts and scholars to identify the type of knowledge that can be used as evidence in order to bridge the gap between research and practice in management. We selected three categories of participants that would best resemble the market structure for management knowledge generated through research: researchers and authors as producers of knowledge, members of top journals' editorial boards as arbiters and disseminators of knowledge, and practicing managers as the main consumers of knowledge. In order to reach a broader audience and increase the reliability of findings, we designed the study as an online survey.

In order to test our assertions and develop an index to assess actionability, we asked different stakeholders in EBMgt – the producers, arbiters, and the users of research - to

identify the value proposition in a piece of research that can be directly implemented into decision making. Our purpose was to explore the notion of actionability among academic researchers (the producers of knowledge), members of editorial boards of relevant journals (the arbiters of knowledge), and practicing managers (the users of knowledge) by presenting them with a description of items pertaining to a piece of research that may best portray attributes of actionability. Our goal is to first identify those items that are common to all three groups – a shared understanding of actionability and then use those items in the formulation of an index of actionability.

4.3.1. Development of a formative measure of actionability

One of the fundamental questions in measurement design is whether to treat the measurement model as reflective or formative (Gerbing and Anderson, 1988). According to classical test theory (Lord, Novick, and Birnbaum, 1968), in a reflective measurement model all items are commonly caused by the construct (Bollen and Lennox, 1991) and therefore all items are highly intercorrelated. Common scales for measuring personality are considered to be reflective as different factors show high inter-correlation (Musek, 2007). However, in a formative measurement model, the indicators are considered to be the causes of a latent variable (Edwards and Bagozzi, 2000; Jarvis, MacKenzie, and Podsakoff, 2003) and there may be no correlation between the different indicators of a construct (Curtis and Jackson, 1962). For example, it is debated whether individual core self-evaluation is a formative construct that causally results from self-esteem, locus of control, general self-efficacy, and emotional stability—all of which are theoretically believed to be independent

from one another (Johnson, Rosen, and Levy, 2008). Moreover, each of the indicators in a formative measurement model apprehends a unique aspect of the construct, and therefore indicators are not substitutable (Diamantopoulos and Winklhofer, 2001). In the underlying theory used for this study, while different components of actionability are conceptually orthogonal and not interchangeable (HakemZadeh & Baba, 2015), they can add practical value. For example, although a study recommendation may be highly rigorous, reliable, and persuasive in that it can yield the desired outcomes, it may not be operational or easy to comprehend for practicing managers. Moreover, based on the theory of actionability, there is a clear causal relationship between the components of the proposed measurement and the actionability of management knowledge. The theory proposes that operationality, causality, contextuality, comprehensiveness, persuasiveness, comprehensibility, and conceptuality collectively result in actionability (HakemZadeh and Baba, 2015).

It is also important for this measure to capture the meaning behind each component of actionability. Jarvis *et al.* (2003) suggest that in many cases a theoretical entity may be measured through a combination of formative and reflective constructs and proposes a taxonomy of multi-level measurement model in which each level can be either formative or reflective. Based on this taxonomy, we conceptualized our proposed measure of actionability to consist of two distinct levels; at the first level, items manifest different indices representing the components of actionability through a reflective measurement model, and at the second level, the indices collectively produce a measure of actionability as shown in Figure 4-1. This type of two-level measurement construct has gained popularity

in recent empirical research and has been used in designing various measurement models (Johnson, Bruner II, and Kumar, 2006; Ruiz, Gremler, Washburn, and Carrión, 2008).

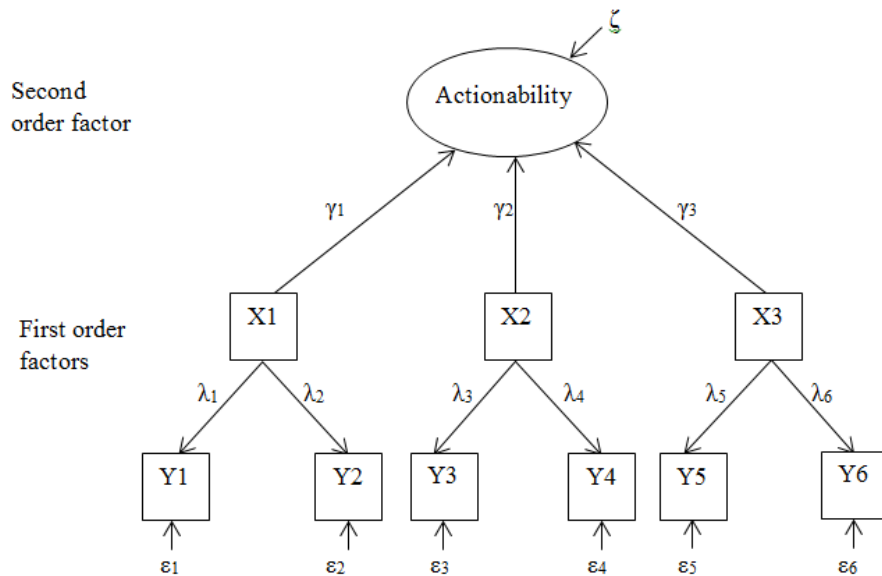


Figure 0-1- Schematic first order reflective- second order formative index of actionability

An initial set of items was generated following an in-depth review of the evidence-based management literature and critical reflection on the best practices in evidence-based medicine. In particular, we focused on discussions that intend to clarify the nature of research that can be readily implemented into decision making (e.g. what research findings can managers trust? What are the characteristics of research that hinders implementation in practice? What are the vivid attributes of research findings that have been popular amongst managers?). A pool of 40 items resulted from this process (Appendix 1). While we justified the use of formative rather than reflective measurement models in capturing the concept of actionability and proposing an index, theoretically we acknowledge that formative models have complexities with regard to their identification and measurement error. In principle, a

reflective measure is used to overcome the identification problem of a formative model. However, the choice of reflective measurement can significantly affect the loadings and meaning of the construct itself, subjecting formative measurement models to interpretational confounding (Howell, Breivik, and Wilcox, 2007). Bollen (2007) argues that the issue of interpretational confounding is due to structural misspecification of a model, and that a choice of reflective measurement, when a construct is theoretically formative, is not acceptable. We tried to overcome this concern by using a two-stage process. We divided our 40 items into 2 scales of actionability: one formative and one reflective. Eight items that were more abstract and general in their wording were selected as part of a reflective scale for actionability and the remaining 32 items were entered into analysis as part of a formative scale. We should note that available statistical techniques for analyzing formative measurement models do not attribute measurement error to observed variables but rather to the construct itself. This assumes that the resulting measurement error is not captured by the proposed dimensions (Diamantopoulos, 2006; Franke, Preacher, and Rigdon, 2008). In order to develop an analytic strategy that would address this shortcoming and capitalize on the benefits of structural equation modeling, the formative actionability index is defined as a combination of reflective and formative models (Jarvis *et al.*, 2003). We thus ran a first order factor analysis on the 32 items, treating them as reflective indicators of actionability attributes and used those attributes as formative components of an overall actionability index.

For ensuring content adequacy, a pilot study was conducted using a sample of 8 doctoral candidates and 3 practicing managers with MBA degrees. On the basis of their

suggestions, the wordings of some of the items were modified to make them more comprehensible. Given that the target sample included management scholars, members of editorial board of influential journals, and practicing managers, we believe that the pilot study was appropriate for ensuring that the items were meaningful and understandable for the eventual participants.

4.3.2. Sample and data collection procedures

Researchers from reputable business schools in the fields of strategy, marketing, organizational behavior, and human resources management, along with members of the editorial boards of several journals¹ were selected. Business schools were selected according to the Financial Times 2014 ranking of the top MBA programs around the globe. This list includes AACSB accredited schools and considers faculty publications in 45 academic and practitioner journals recognized by the Financial Times (FT45) as one of its main selection criteria. Email addresses of these individuals are publicly available. They received an email including a description of the study and a link to the online portal where they could complete the web-based survey. Moreover, an email was sent out to program coordinators of five executive MBA programs and they were asked to forward an electronic message including a link to our survey to individuals enrolled in their executive MBA programs. The universities that were selected have selective admission requirements that

¹ Journal of Organizational Behaviour, Organizational Behavior and Human Decision Processes, South Asian Journal of Management, Academy of Management Review, Human Resource Management Journal, Human Resource Management Review, Administrative Science Quarterly

admit only individuals with evidence of substantial work experience. Overall 924 emails were sent out and 223 participants chose to respond to the survey for an overall response rate of 24 percent. This response rate is representative of those for similar voluntary surveys (Lefever, 2007). Of the 223 participants, 100 individuals identified themselves as practicing managers: 145 as educators, 168 as researchers, and 68 as journal editors. Eleven individuals identified with other occupations including consultant, engineer, firm owner, and so forth. It is evident that most participants identified with more than one role. Of those that responded, 38.9% had completed a Master's degree, 58.3% a Doctoral degree, and the rest had some college, professional degree, or Bachelor's degree.

4.4. Analyses

To clean the data we first excluded responses from participants that had only completed demographic data. Second, we identified surveys completed at random. Because data were collected through Survey Monkey, we had the option of observing the amount of time each participant had spent completing the survey. In order to increase the reliability of the data and to eliminate responses that had been completed in a cursory fashion, responses on which less than one minute was spent were excluded. With these eliminations, the sample size was reduced to 187. The missing items from the remaining responses were minimal, random, and all less than 5%. Therefore, the missing variables were calculated using the expectation maximization covariance.

For assessing the adequacy of this sample size for Exploratory Factor Analysis (first order), several recommendations and guidelines exist. Hair Black, Babin, and Anderson

(2009) advocate that sample sizes for this type of analysis should be 100 or greater. Comrey and Lee (2013) categorize sample sizes of 100 as poor, 200 as fair, 300 as good, 500 as very good, and 1000 or more as excellent. Sapnas and Zeller (2002) suggest that even 50 cases may be satisfactory for factor analysis. Therefore we conclude that the sample size here (N=187) can be considered fair. With regards to the ratio of responses to number of variables, the general rule of 3:1 (Hogarty, Hines, Kromrey, Ferron, and Mumford, 2005) is satisfied by this sample size.

In order to determine the factorability of data, we used the correlation matrix of 32 formative items. Tabachnick and Fidell (2012) recommend inspecting the correlation matrix for correlation coefficients over 0.30. Hair *et al.* (2009) categorized these loadings using another general rule of thumb as ± 0.30 =minimal, ± 0.40 =important, and ± 0.50 =practically significant. In order to meet the minimum requirement and keep as many items as possible in the analysis, the correlation matrix was checked for items with the least number of correlations above 0.3. Twelve items which had less than 5 correlations greater than 0.3 were eliminated from the analysis. The determinant of the R-matrix was equal to 0.000129, which indicated that there was no multicollinearity issue associated with the remaining items. The Kaiser-Meyer-Olkin (Kaiser, 1974) Measure of Sampling Adequacy for this sample was 0.804 and Bartlett's test of Sphericity was significant.

A factor reduction analysis was conducted using IBM SPSS Statistics 22. The specifications were Principal Component Analysis using the Varimax rotation with Kaiser normalization. Based on the Eigenwert criterion, six factors were extracted from the data

that cumulatively explained 68.06% of the variance in the overall construct of actionability. Items with coefficients of less than 0.5 were suppressed from the rotated matrix. The Cronbach’s alpha of each factor was calculated, and all factors exhibited good levels of reliability (Table 4-1). This resulted in 18 items loaded into six first-level factors. The correlation matrix of these items can be found in appendix 2 of this paper. Factors labeling was guided by the items, the theory of actionability, and the theme the items were originally intended to represent.

Table 4- 1- First order factors of actionability

Label	Item	Item description	Item weight	Cronbach’s Alpha
Operational and Causal	OPER1	Explicit recommendations regarding a managerial practice	.813	.80
	OPER2	Based on factors that managers can control	.759	
	OPER3	Direct implications for a course of action	.862	
Contextual	CONT1	Describes the type of organizations that can benefit from the recommended course of action.	.816	.90
	CONT2	Explains the category of employees that can benefit from the recommended course of action.	.874	
Comprehensive	COMP1	Potential negative outcomes	.766	.80
	COMP2	Legal consequences	.822	
	COMP3	Ethical consequences	.702	
Persuasive (Rigorous)	PERS1	Demonstrates the validity of its findings.	.736	.70
	PERS2	Published in a trustable journal.	.608	
	PERS3	Based on reliable data.	.537	
	PERS4	Including definition of key terms.	.792	
Persuasive (Unbiased)	UNBI1	Based on several unbiased and high quality studies.	.806	.84
	UNBI2	Based on studies that have been conducted in transparent and well documented manner.	.772	
	UNBI3	Based on studies that have been validated and confirmed through replication.	.814	
Comprehensible	COMM1	Helps to classify and categorize observation	.687	.67
	COMM2	Helps to more effectively communicate one’s understanding and perspective to others inside and outside their organizations	.841	
	COMM3	Explains why a course of action is more effective than other alternatives	.577	

In order to examine how these six factors would formatively measure actionability, the factor scores of the six components were used as formative indicators within the partial least squares (PLS) two-construct model, a widely used approach for analyzing formative measures (Petter, Straub, & Rai, 2007). The two-construct PLS model solves the identification problem for the formative measurement by assuming a reflective scale of actionability as the dependent variable (Christophersen and Konradt, 2006). The eight items used for the reflective measure of actionability are listed in Table 4-2. A Cronbach’s alpha of .65 showed an acceptable level (Kline, 2013) of reliability for the reflective measurement, and did not significantly improve by removing any items.

Table 4- 2- Reflective items for actionability

	Research is actionable when:	Cronbach’s alpha if item is deleted	Scale Cronbach’s alpha
I1	It is relevant to practice.	.630	.653
I2	It recommends a cost effective action.	.638	
I3	It explains the reason for the managerial problem through cause and effect relationships.	.619	
I4	It lists the short term and long term outcomes of the recommended course of action	.599	
I5	It adopts appropriate research method based on my understanding of the subject and the nature of the managerial problem.	.647	
I6	It bases its recommendations on comprehensive and exhaustive literature reviews.	.655	
I7	It explains situational factors that affect the effectiveness of the recommended course of action.	.583	
I8	It is articulated in an easy to comprehend language.	.598	

Therefore, all eight items remained in the study. Looking at the participants and data, one possible explanation for the Cronbach’s alpha below .70 may be that the sample is highly homogenous as many simultaneously identified as researchers, member of scholarly journals’ editorial boards, and practicing managers. While formative

measurements are not expected to have internal consistency, the evidence of no internal consistency may lead to a perception of poor design (Edwards, 2010). In order to rule that out, we estimated the Cronbach's alpha resulting from the six factor scores ($= .75$).

In the PLS two construct model, the *formative actionability* functions as a predictor for the dependent *reflective actionability*. This allows us to identify actionability as a formative measurement model by simultaneously analyzing it as a structural model (Petter *et al.*, 2007). The model was analyzed through Smart-PLS. In order to determine the significance of the model, a bootstrapping procedure was run. The two-tailed P-value test showed significance at 0.000. The path coefficient turned out to be very high ($\beta = 0.85$). Also, the determination coefficient showed a very high value of $R^2 = 0.72$. Results revealed a strong positive relationship between both newly developed actionability scales. This leads to the conclusion that the set of six formative usability indicators cover the concept of actionability very well (Figure 4-2).

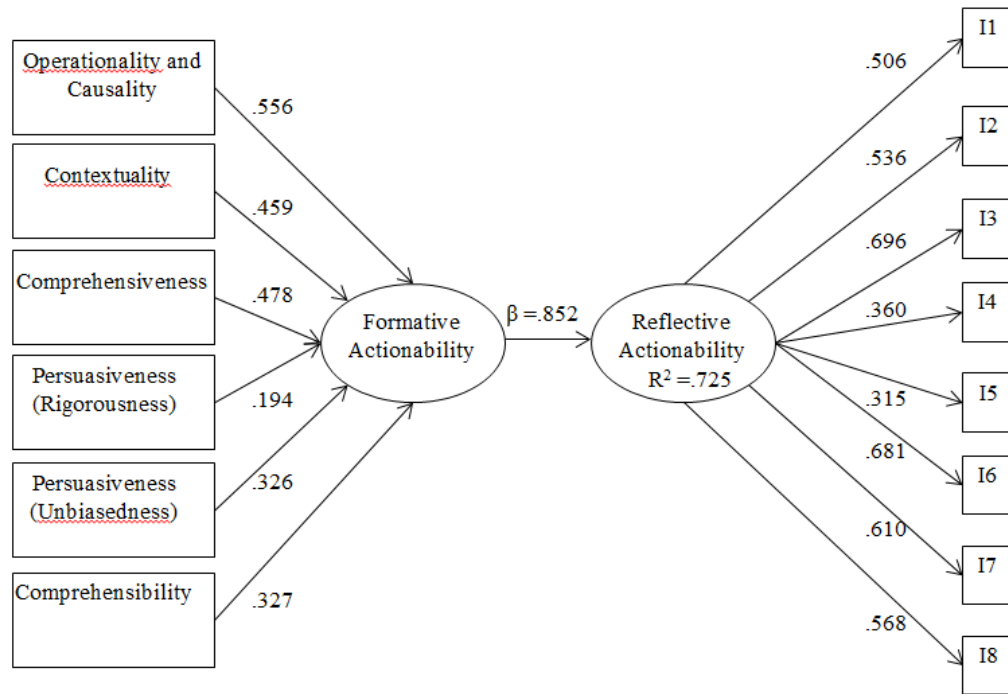


Figure 0-2- Two construct model for validation of formative measure of actionability

4.5. Discussion

The broad purpose of this study is to design an empirical tool anchored in theory to facilitate Evidence-based management. We offer an index to assess the actionability of management research for implementation in organizational settings. The index allows for the classification of research evidence in terms of its actionability. In combination with indices of rigor and relevance, it constitutes a robust measure of the evidence available for managerial decision making. We provide an empirical framework for the production, evaluation and utilization of actionable knowledge. We conceptualize it as a formative measure. In the process of arriving at the index of actionability through a formative measurement model, we also developed a reflective *scale* of actionability. We defined the formative measure of actionability as a combination of reflective factors at the first level,

and formative factors at the second level in order to overcome the limitations of formative measurement models in estimating error terms. Our theoretical conjectures regarding the dimensions of actionability and how they would form an overall construct of actionability were substantially supported. Six factors, largely in alignment with the theoretical dimensions of actionability were identified. Persuasiveness separated into two factors, one of which focused on unbiasedness viewing actionable recommendations to be based on several unbiased and high quality studies conducted in a transparent and well-documented manner and validated and confirmed through replication; the other referred to rigorousness and conceptuality, focusing on robust definition of constructs, validity and reliability of measures, and the trustworthiness of the journal. This slightly modifies our theoretical framework splitting persuasiveness into two separate attributes. Furthermore, based on our analysis, causality seems to be perceived as inseparable from operationality, as actionable research is expected to be based on factors that managers can control and make explicit managerial recommendations with implications for a direct course of action. The other factors are identified as comprehensiveness, contextuality, and comprehensibility, which are all in alignment with the theoretical dimensions of actionability.

Judgment about what studies to include in a systematic review or how to evaluate the actionability of the final report is complex in nature. The actionability index makes this process relatively easier and more consistent by suggesting six main areas of evaluation. For each factor, actionability of research can be graded high, moderate, or low, and an overall score of actionability can be estimated based on the grading. The index proposed here is general and is not weighted toward any specific domain or audience as is. For

evaluating actionability of research in a specific domain or managerial problem, a review team responsible for conducting a systematic review may and can assign specific weights to each factor based on the nature of the managerial problem and preferences of the final consumers of the research.

In essence we believe that the value of the index lies in the following:

1. The index can be used to assess both the overall actionability of management research and the strength of different aspects of actionability pertaining to that research.
2. The index is applicable to a wide variety of research topics and fields in management.
3. Items included in the index are worded in such a way as to be useful for both practitioners and researchers.

The index is designed to be brief and can be easily computed. The main limitations of this study are due to its exploratory nature, which can be resolved only through future research. First, there is the issue of identifying the formative index of actionability by considering its reflective model as a dependent variable in the PLS two-construct model. While this is a common approach for developing formative measurements, it would be beneficial for future research to consider other dependent variables such as decision outcome, decision confidence, and so forth, and to compare the results. Second, a separate study can increase the reliability of the proposed index of actionability through inter-rater reliability analysis of available systematic reviews in the field. It would then be possible to

test whether different stakeholders in the system of management knowledge production are able to consistently evaluate actionability of research according to the proposed index. Furthermore, it would be insightful to investigate whether research that is ranked high on actionability can actually lead to higher quality decisions through experimental designs or field studies.

In this study we have offered an index of actionability. It has an empirical base. However, its utility for EBMgt remains to be seen. Our hope in putting it out in the public domain is to have it tested, revised and eventually put to use in the development of Systematic Reviews that facilitate EBMgt.

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Appendix 1) Pool of items used in the survey

Please read the following statement and on the scale of 1 to 5 determine how important it is for research to possess the following characteristics to be considered useful for decision making. Research is useful for managerial decision making when:

It is driven by real problems.

It is relevant to practice.

It includes explicit recommendations regarding a managerial practice.

The recommended actions focus on factors that managers can control.

It has direct implications for a course of action.

It provides measurement and tools in order to help managers make sense of the research question in their own context and setting.

It recommends a cost effective action.

It describes how to measure the cost of implementation.

It helps managers to classify and categorize their observation.

It helps managers to more effectively communicate their understanding and perspective to others inside and outside their organizations.

It explains why a course of action is more effective than other alternatives.

It gives a general theoretical understanding of the phenomena.

It establishes a cause and effect relationship between recommended decision and decision outcomes.

It explains the reason for the managerial problem through cause and effect relationships.

It acknowledges the complexity of the managerial problems.

It explores the problems from various angles.

It lists all the potential negative outcomes of the recommended course of action.

It addresses the legal consequences of the recommended course of action.

It addresses the ethical consequences of the recommended course of action.

It lists the short-term and long-term outcomes of the recommended course of action.

It adopts appropriate research method based on my understanding of the subject and the nature of the managerial problem.

It demonstrates the validity of its findings.

It is published in a trustable journal.

It bases its recommendation on reliable data.

It bases its recommendation on one single study.

It bases its recommendations on comprehensive and exhaustive literature reviews.

It bases its recommendation on several unbiased and high quality studies.

It bases its recommendation on studies that have been conducted in transparent and well documented manner.

It bases its recommendations on studies that have been validated and confirmed through replication.

It demonstrates sophisticated statistical analysis.

It includes only quantitative studies.

It includes only qualitative studies.

It combines findings from both qualitative and quantitative studies.

It explains situational factors that affect the effectiveness of the recommended course of action.

It describes the type of organizations that can benefit from the recommended course of action.

It explains the category of employees that can benefit from the recommended course of action.

It is articulated in an easy to comprehend language.

It does not extensively use technical and scientific language and vocabulary.
 It provides definition of key terms.
 It is short and to the point.

Appendix 2) Correlations between formative indices of actionability

	OPER1	OPER2	OPER3	CONT1	CONT2	COMP1	COMP2	COMP3	PERS1	PERS2	PERS3	PERS4	UNBI1	UNBI2	UNBI3	COMM1	COMM2	COMM3
OPER1	1.00																	
OPER2	0.50	1.00																
OPER3	0.65	0.57	1.00															
CONT1	0.23	0.27	0.26	1.00														
CONT2	0.18	0.32	0.26	0.82	1.00													
COMP1	0.27	0.20	0.16	0.35	0.33	1.00												
COMP2	0.23	0.21	0.15	0.44	0.46	0.54	1.00											
COMP3	0.19	0.22	0.13	0.41	0.44	0.44	0.73	1.00										
PERS1	-0.04	-0.01	0.04	0.14	0.13	0.08	0.08	0.10	1.00									
PERS2	-0.07	0.00	-0.04	0.04	0.11	-0.06	-0.02	0.07	0.44	1.00								
PERS3	-0.08	0.02	0.03	0.20	0.15	0.06	0.08	0.12	0.51	0.25	1.00							
PERS4	0.09	0.04	0.13	0.22	0.23	0.20	0.15	0.30	0.44	0.30	0.34	1.00						
UNBI1	0.12	0.17	0.11	0.26	0.18	0.23	0.17	0.24	0.39	0.29	0.34	0.24	1.00					
UNBI2	0.02	0.12	0.05	0.20	0.19	0.07	0.05	0.22	0.46	0.43	0.51	0.33	0.65	1.00				
UNBI3	-0.01	0.11	0.04	0.20	0.22	0.18	0.15	0.23	0.32	0.19	0.33	0.21	0.61	0.64	1.00			
COMM1	0.21	0.24	0.21	0.34	0.27	0.30	0.26	0.29	0.12	0.05	0.11	0.12	0.24	0.16	0.16	1.00		
COMM2	0.25	0.16	0.21	0.33	0.31	0.21	0.19	0.30	0.08	0.15	0.04	0.14	0.19	0.18	0.17	0.47	1.00	
COMM3	0.33	0.24	0.25	0.38	0.33	0.30	0.21	0.28	0.21	0.11	0.13	0.27	0.24	0.26	0.20	0.30	0.45	1.00

Chapter 5: Toward a Theory of Collaboration for Evidence-Based Management

Citation: Farimah HakemZadeh, Vishwanath V. Baba, (under review) “Toward a theory of collaboration for evidence-based management”, *Management Decision*.

Abstract

Purpose: The main objective of this paper is to address the research-practice gap in management and in particular to advocate the need for an independent organization, called the Evidence-based Management (EBMgt) Collaboration, in order to facilitate generation and dissemination of knowledge that is rigorous, relevant, and actionable.

Design/methodology/approach: We first focus on the existing challenges in the research-practice gap literature. We then argue that EBMgt offers the most viable path to narrow this gap by means of systematic reviews of quality appraised studies. We propose a theory of collaboration that conceptualizes the role of the EBMgt Collaboration in involving various stakeholders in the process of knowledge generation, identifying relevant research questions, establishing rigour, and preparing and disseminating actionable reports.

Findings: We envision evidence at the center of the EBMgt Collaboration and have designed a framework of sustainable communication between producers, arbiters, and users of evidential knowledge with the goal of bringing rigour, relevance, and actionability together. Based on the characteristics of evidence, we have also proposed a template for systematic reviews as the final product of the EBMgt Collaboration.

Research and practical implications: Our theory of collaboration brings together various competing ideas and recommendations, made over the past few decades, in order to close the research-practice gap in management. Through this theory we have also answered some of the criticisms towards EBMgt and questions raised about its viability. This theory can be used as a guideline to establish and maintain the operation of an EBMgt Collaboration.

Originality/value: Our work provides a theoretical platform for the idea of EBMgt Collaboration that was not available before. We add value to the research-practice gap literature by addressing the critical issues of this domain including identifying relevant research problems, evaluating and grading evidence, fostering communication between researchers and practitioners, and research translation. The Collaboration is conceptualized not as a research method but as a separate social system that links key management knowledge stakeholders together.

Keywords: Evidence-based Management Collaboration, Research-practice gap, Actionability, Systematic Reviews

5.1. Introduction

The rate at which new research papers are published has increased drastically in the past few decades, likely due to the widespread influence of internet and online publication initiatives. In 2014 alone, more than 80,000 scholarly articles were added to the literature. How can one make sense of this enormous amount of information? What should be included in business textbooks as support for theories and models? What articles should one trust in practice? In particular, when faced with a problem in an organizational setting, what knowledge is effectively helpful? Finding answers to these questions is crucial to the legitimacy of research and education in business schools because business is considered a practical field and management research and education can add no value if the generated and disseminated knowledge fails to effectively influence and improve practice.

In this paper, we examine the practical value of management research and how to bridge the gap between management knowledge and management practice. We are motivated by the principles of evidence-based management (EBMgt) for addressing the research practice gap (Rousseau, 2006). We put forward a model for collaborative research in management and construe this collaboration as an independent institution that oversees the processes of evidence generation, synthesis, and dissemination. Furthermore, we suggest tools and frameworks that can facilitate these processes. Theory development on this subject is particularly important as past efforts to close the gap between knowledge and practice have been criticized for lack of a rigorous theoretical grounding (Kieser *et al.*, 2015).

5.2. The need for EBMgt collaboration

Researchers and experts have repeatedly voiced their concerns (Bartunek, 2003; Hambrick, 1994; Huff, 2000) and offered proof (Deadrick and Gibson, 2007; Rynes *et al.*, 2002) that the voluminous management literature generated through academic research is failing to inform management practice and that a significant gap exists between the two. The central tenet of EBMgt is that managers must incorporate the best available research evidence in their decisions in order to be successful (Rousseau, 2006). While strategic decisions are based on privileged managerial and organizational knowledge; managers' insight, judgment, and experience; unique environmental and organizational characteristics; timing; and so forth, strategy implementation and the associated organizational processes should be based on professional, evidence-based knowledge. Such is the case in the field of engineering where a unique technological innovation is enabled by technical rules that are common knowledge for all professional engineers. Evidence in EBMgt can come from various sources and be developed through different research methods including action research (Coghlan, 2011; Levin and Greenwood, 2001; Reason, 2006), design science (Romme, 2003; Romme and Endenburg, 2006; van Aken, 2004; van Aken, 2005), mode 2 knowledge generation (Huff, 2000; MacLean *et al.*, 2002; Mohrman *et al.*, 2008), and other common research practices such as meta-analysis, cross-sectional studies, experiments, case studies, and so forth. Generally, it is suggested that a critical and judicial synthesis of all available research on a certain practical question yields the most reliable evidence (Tranfield *et al.*, 2003).

It is noteworthy that management is not the first discipline facing the research-practice gap. This gap initially stems from the specialized self-governed system that academic knowledge generation became. Methods of inquiry gradually came to require specific knowledge, skills, and training almost exclusive to the academic community, and because the main objective of research was to uncover truth, scholars could choose research topics based merely on self-interest (Asimakou, 2011). Ironically, this system of knowledge production cannot sustain fields such as medicine, engineering, and management where the objective is to inform practice and where academics are not the only stakeholders. While medicine and engineering have connected with practice through registration and licensing procedures and collaborative research, management knowledge has become highly autonomous and isolated from management practice (Khurana and Nohria, 2008). This isolation has stunted communication between stakeholders of management research and has led to the conclusion that the gap between management knowledge and practice is unbridgeable (Kieser and Leiner, 2009).

Medicine and public policy appear to have narrowed the gap between knowledge and practice mainly through redefining their model of knowledge generation and dissemination. Fifty years ago, despite the availability of high quality research studies on the effectiveness of various interventions and the demand for informed treatment, physicians were making decisions based on limited personal experiences and insight (Cochrane, 1972). The Cochrane collaboration was established to narrow the gap between research and practice. A sister organization, Campbell Collaboration, addresses the same issue in policy making and provides evidence for policy makers to support decisions on

education system, crime prevention, and environmental management. In both cases, evidence-based practice is conceptualized through the interplay of evidence and context with an independent organization facilitating the process (Kitson *et al.*, 1998). While not every aspect of the Cochrane and Campbell collaborations are applicable to the field of management due to the epistemological and ontological differences between the fields, the concept of an independent organization responsible for evaluating evidence and synthesizing findings to increase their practical usefulness can help narrow the gap between management research and practice.

5.3. A theory of collaboration in EBMgt

The idea of an EBMgt collaboration (Rousseau, 2007) and a “relational scholarship of integration” (Bartunek, 2007) for the field have been advocated as a means to smooth the progress of EBMgt. This approach assumes that in addition to being a knowledge transfer problem, the research-practice gap in management is also a knowledge production problem (Van de Ven and Johnson, 2006). The argument is that traditional knowledge production methods are not capable of capturing the level of complexity of an organizational phenomena through one single study (Azevedo, 1997), and while several calls for close collaboration between researchers and practitioners have been made, current research practices do not systematically involve practitioners’ interests and perspectives in the research process. The EBMgt collaboration initiates this process by systematically involving practitioners and knowledge disseminators in the knowledge production process in order to gather, evaluate, and certify the value of evidence for the field of management,

and by effectively disseminating such evidence to different users (Figure 5-1). We propose that:

P1: Evidence is the foundation of evidence-based management and is generated through collaboration.

P2: An active ongoing collaboration among the producers, arbiters, and users of evidential knowledge organized as a sustainable community is needed to generate evidence to guide the management profession.

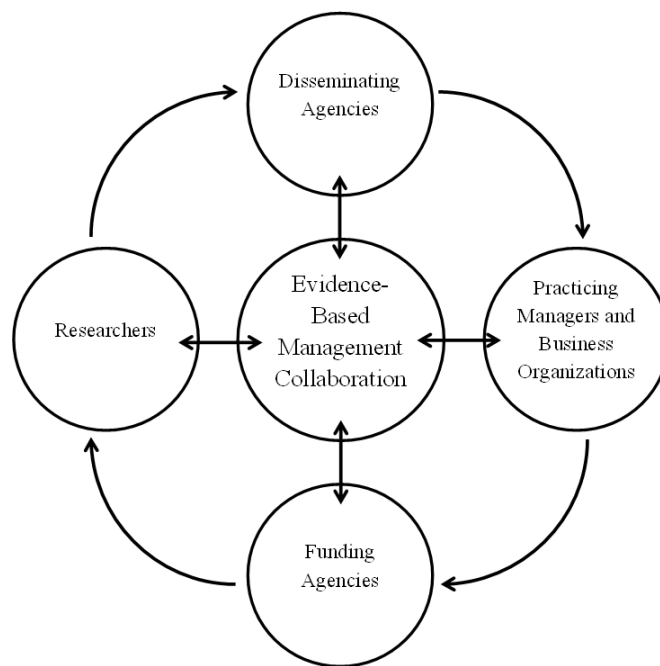


Figure 5-1- Evidence-based management collaboration: Stakeholders and their interactions

The Center for Evidence-Based Management (CEBMa) in the Netherlands is a pioneer in promoting EBMgt through offering services such as rapid evidence assessment, training managers and business students on principles of EBMgt, and providing access to

scholarly articles. Broadly, it has been argued that good decisions are based on two important types of evidence: scientific and local (Rousseau *et al.*, 2008). While the task of identifying relevant local evidence is left to practitioners, creating trustworthy and useful scientific evidence is the responsibility of the academic community. For generating the best scientific evidence, EBMgt collaboration needs to identify and manage the enormous amount of management knowledge and synthesize it into an actionable format. This is particularly important because research is scattered in various journals and publications. Moreover, published research represents only a fraction of generated knowledge. A recent study confirmed that publication bias is still an issue as authors do not submit null findings and insignificant results due to a perception that these will not be accepted for publication (Franco *et al.* 2014). Various cases of contradictory findings on simple managerial practices (e.g., Is goal setting effective in increasing motivation and improving performance or does it have systematic side effects? (Locke and Latham, 2002 vs. Ordóñez *et al.*, 2009) Is pay an effective motivator? (Pfeffer, 1998 vs. Rynes *et al.*, 2005); Are homogenous groups more effective? (Broschak and Davis-Blake, 2006 vs. Richter *et al.*, 2006) make the implementation of science-based evidence even more confusing. Moreover, management knowledge is produced and consumed not only at universities, but also in large corporations, small start-up companies, government agencies, management consultancies, and so forth (Gibbons *et al.*, 1994). In order to generate the best scientific evidence, knowledge produced at these different sites must be aggregated and integrated. However, produced knowledge is not always identifiable and can have large variances in terms of precision, reliability, data source, and context. Management knowledge produced inside

organizations is usually harder to transfer and integrate. It can be tacit knowledge, which is difficult to codify and articulate (Nonaka *et al.*, 1994) and which is mainly transferred through observation (Nadler *et al.*, 2003). Moreover, in uncontrolled organizational settings, establishing causality—an important aspect of evidence—is difficult (Szulanski, 1996). Even knowledge that is generated at universities has certain methodological limitations (e.g., sampling error, limited ability in establishing causality) and while the peer review process attempts to appraise the quality of the published studies, the process is often subjective and by no means perfect (Horrobin, 1990; Smith, 2006). As a means of generating practically useful knowledge, a core task of an EBMgt collaboration is to continuously appraise the value of the different pieces of knowledge and synthesize them into a more useable and trusted format.

Once knowledge is produced and implemented, feedback provides an invaluable source of knowledge that can uncover implementation challenges, contextual underpinnings, or unforeseen causal relationships. Organizations and societies are restricted in decision making and evidence implementation due to the legal and ethical frameworks under which they function (Baba and HakemZadeh, 2012). Context is an important issue in the process of evidence implementation (Rousseau and Fried, 2001). The context in which knowledge is generated may be different from the one in which it is implemented in terms of industry, culture, economy, labor market, and so forth. The EBMgt collaboration should be responsible for systematically addressing these issues and providing solutions. We therefore propose that:

P3: Evidence is developed through management research, application of research findings, contextual information and fit, best practice heuristics, ethical frameworks developed through practice, statistical and narrative reviews, and ongoing assessment of their value.

In order to generate practically useful knowledge, the EBMgt collaboration needs to identify the attributes of evidence to foster its implementation. We argue that the synthesis of evidence should result in knowledge that is relevant, rigorous, and actionable. Relevance of research refers to its connectedness to practice, rigour relates to the degree of accuracy and precision, and actionability is the extent to which it contains specific implementable recommendations for managerial action. Debates on the causes of the research-practice gap in management have identified the lack of relevance (Bartunek and Rynes, 2014; Donham, 1922; Hilgert, 1972) as well as the tension between rigour and relevance (Gulati, 2007; Hodgkinson *et al.*, 2001; Tranfield and Starkey, 1998) as the key contributors. Nearly a century ago, when business schools first came into existence, students were educated by executives who drew from their personal experiences and therefore nearly everything seemed relevant. Gradually, the pressure for immediate application was replaced by an emphasis on rigour (Thompson, 1956) and, in line with many other academic disciplines, the pursuit of theoretical and methodological rigour became the norm of management research and education. Both theoretical rigour, which reflects researchers' focus on developing new theories and testing them, and methodological rigour, which indicates the extent to which research relies on collecting and quantitatively analyzing empirical data, have eroded the overall relevance of research to

practice (Robey and Markus, 1998). Relevance stems from how interesting, timely, applicable, and accessible the research is to managers (Benbasat and Zmud, 1999). However, primary emphasis on theoretical rigour has resulted in excessively complex constructs, multiple frameworks, and speculative relationships that are of little interest to managers. Moreover, establishing methodological rigour is time consuming and results in extensive statistical analysis and arguments that make comprehension difficult for a wider practitioner audience. Furthermore, data collected for ease of methodological manipulations that ensures rigour often lacks personal insights and or organizational familiarity.

Additionally, incorporating the capacity for effective action and prescriptive qualities to guide managerial practices and interventions were nearly omitted as a requirement of management research (McKelvey *et al.*, 1999). This is crucial as management is a professional discipline. The core contribution of management research is determined by the extent to which it can lead to actionability (Martin, 2012). According to Bartunek (2007) the “implication for management practice” sections of articles that should be aimed at actionability mostly make recommendations regarding increasing awareness or providing training on a topic rather than actual actionable recommendations. Actionability is defined as the extent to which research is readily implementable for helping practitioners make better decisions (Pearce and Huang, 2012). While the concept of actionability is somewhat similar to Thomas and Tymon’s (1982) idea of operational validity and viewed as a component of relevance, Argyris (1996) argues that actionability is an attribute of research that is independent of rigour and relevance. Relevance in particular concerns

whether research is of interest to decision makers and of conceptual significance to their practice. Actionability, on the other hand, is focused on enabling practitioners to control the outcomes of their decisions through certain interventions.

It is important to note that while management practitioners and researchers have different training, experience, and values in their pursuit of knowledge, both can benefit from a closer connection between research and practice. Academics value rigour and are trained to enhance it through more robust research studies. Practitioners have a closer interaction with daily organizational problems and decision making and therefore are interested in acquiring actionable knowledge that would enable them to make more effective decisions. Other key players are the knowledge disseminators, who are interested in a knowledge that can attract the most audience, are interested in relevance. Through close collaboration between these stakeholders, the goals of each can be achieved. A framework that brings rigour, relevance, and actionability together adds value by aligning the different interests and purposes. It is this alignment that provides the means and rationale for the engagement and collaboration of researchers, knowledge disseminators, and practitioners. We therefore argue that:

P4: Evidence value is enhanced through a fusion of rigour, relevance, and actionability.

P5: Producers of knowledge focus on rigour, the arbiters on relevance, and the users on actionability. A global collaboration will engage significant producers of theoretical and empirical knowledge, significant arbiters of theoretical, empirical,

and practical knowledge, and users of such knowledge in the best available combination.

As EBMgt views the complexity and fragmented nature of management research as the main cause of research practice gap (Rousseau, 2007), it suggests that reviewing, consensus building, and accumulating literature in the form of systematic reviews provides a viable strategy to close the research-practice divide (Tranfield *et al.*, 2003). Systematic Review (SR) is a process that adopts certain strategies in order to avoid common review biases and generate a more accurate understanding of the state of evidence on a specific topic (Gough *et al.*, 2012). Systematic reviews mainly focus on evaluating the extent of effectiveness of a certain intervention and practice and informing practitioners rather than on developing new theories or identifying moderators. Moreover, they add value to the review process through a carefully crafted review protocol and through listing inclusion and exclusion criteria and evaluating the quality of the evidence derived from each study. Furthermore, while meta-analyses only focus on quantitative data, systematic reviews include qualitative research, case studies, and other forms of knowledge and are therefore more comprehensive. More importantly, they frame the research question and its value to management practice.

Some critics of the systematic review method argue that because randomized controlled trials, which are known as the strongest form of evidence in evidence-based medicine, are not possible in management research, evidence generated through systematic reviews can never achieve the same level of precision (Reay *et al.*, 2009). However, the framework for grading evidence in any field of study is field specific and should be derived

from its epistemological and ontological bases. As a result, EBMgt does not evaluate evidence based on the same metrics used by fields of medicine or policy making. Moreover, protocols of systematic review in medicine are not solely limited to randomized controlled trials and recognize that the best available evidence can stem from observational (e.g. Hackett *et al.*, 2005; van Tulder *et al.*, 1997), cross-sectional (e.g. Robinson and Nicol Ferrier, 2006; Shrewsbury and Wardle, 2008), or qualitative studies (e.g. Munro *et al.*, 2007; Popay *et al.*, 1998). Therefore, systematic reviews are relevant in closing the research-practice gap even in the field of management where randomized controlled trials are not possible. Hence, we propose that:

P6: The collaboration will generate and disseminate such knowledge in the form of systematic reviews of those research questions deemed to be of value to management practice.

Various guidelines on evidence-based management as well as protocols on generating systematic reviews generally list choosing a relevant and high demand review question as the first important task for producing evidence (Gough *et al.*, 2012; Higgins *et al.*, 2008). Articulating the right research question and hypothesis is critical for an evidence-based collaboration where conducting systematic reviews relevant to management practice is the aim. Despite there being more agreement in healthcare or engineering as compared to management (Tranfield *et al.*, 2003) about which are the relevant research questions in these fields, a disciplined approach to choosing research questions can effectively help to identify relevant research topics in other fields. Generally speaking, choosing a research topic consists of three stages: topic identification, topic

nomination development and selection, and topic refinement for research review (Agency for Healthcare Research and Quality, n.d.). A common academic practice for identifying research questions in management is to carefully scan the research literature and identify gaps or blind spots. This potentially frames a good research question for a systematic review if the focus is on identifying the practical rather than theoretical gaps in the literature. The second approach is to carefully monitor the trends and practices that are gaining popularity among practitioners or key firms in different industries and to predict the research questions that may arise in the future. Finally, the third approach promotes open communication between researchers and the professional community (Sutherland *et al.*, 2011). For example, management consultancy firms are well-informed about current practical questions. The EBMgt collaboration can actively survey the professional community about research questions they would be most interested to read about or can facilitate two-way communication by means of online portals through which research questions can be directly submitted. By including other stakeholders of a decision process from the early steps of identifying appropriate research questions, the collaboration increases the relevance of the systematic reviews that will be published (Cash *et al.*, 2003; Sarewitz and Pielke Jr., 2007). Stakeholders include any group or individual who can affect or be affected by a systematic review (Freeman, 2010). The theory of stakeholder identification (Mitchell *et al.*, 1997) provides a framework based on stakeholders' power, legitimacy, urgency, and salience, according to which the EBMgt collaboration can determine and prioritize various stakeholders that can help identify research questions and other steps in the review process. The identified research question can then be nominated

by the collaboration, and review teams can either be hired (if funding is available) or selected on a voluntary basis to conduct the reviews. As systematic reviews are often well-cited, there are likely many scholars willing to conduct systematic reviews. Another incentive for writing a good systematic review is the compensation the author can receive each time a systematic review is downloaded.

The review team is in place to evaluate and refine the research question. If necessary, the review team may further clarify the research question in cooperation with the stakeholders. If, however, the research question is focused and clear, the review team will next verify whether a systematic review on the topic already exists. Depending on the research question, the review team can either update the available systematic review or prepare a technical brief for the stakeholders and other practitioners. If there are no previous systematic reviews available on the research question, the review team assesses the possibility of conducting a systematic review by scanning the literature on the subject. If the literature is sufficient, the team begins planning a systematic review. If however, evidence on the particular question is scarce, the collaboration communicates this finding as a promising research area to journals, conferences, and researchers.

When the need for a systematic review is established, the review team focuses on developing a review protocol. The protocol helps coordinate the research process and reduces potential biases throughout the review (Higgins and Green, 2011). A review protocol should include sufficient details and any future changes to the protocol should be clearly documented and justified (Kitchenham, 2004). Developing a review protocol starts

by carefully formulating the research question. Review questions suitable for a systematic review usually examine the effectiveness of a managerial practice (e.g., pay for performance), the pervasiveness of the practice, variations in the practice, risk factors involved, contexts where such practices are in vogue, the possibility of predicting its organizational outcomes, and the economic value of the practice (Glasziou *et al.*, 1999). A more general framework suggests that questions that can be answered through a systematic review specify population, intervention, and outcome (Counsell, 1997). A similar standardization for question formulation, developed by each review coordination group, can facilitate the process of generating unbiased and practically useful reviews in management. The protocol should also clarify keywords and identify databases that would best extract the studies to answer the research question. Moreover, protocol should provide viable strategies such as contacting researchers in relevant areas or scanning conference proceedings to identify unpublished studies that address the publication bias. In addition to identifying relevant research questions in the quest to generate rigorous knowledge, the EBMgt should support different activities of review teams. Rigour is achieved through providing leadership in coordinating review teams by providing tools to facilitate managing data, grading evidence, evaluating risk of bias, and comparing studies from different contexts. To that end, we propose:

P7: The collaboration will seek guidance for research questions of value through a mechanism of continuous exchange among members of the community.

P8: The collaboration will commission systematic reviews based on the research questions from a team of knowledgeable scholars and practitioners.

The next phase would be to assess the quality of each piece of evidence that is retrieved. While guidelines on grading evidence exist (Cook *et al.*, 1995; Fletcher and Sackett, 1979; Sackett, 1989), these grading schemes are not completely applicable to grading evidence in management. Unlike medicine, there is an on-going challenge of “paradigm wars” in management research (Hatchuel, 2005) where there is neither epistemological nor ontological unity in the field. To address this challenge, Johnson and Duberley (2000) suggest a typology of management research based on subjective and objective ontology and epistemology. According to this typology, researchers with an objective view on epistemology believe that the external world can be objectively observed and understood, while those with a subjective view believe that reality only exists through perception and cannot be unanimously observed and understood. Moreover, objectivist ontology suggests that reality exists independently of its observer, whereas a subjective view of ontology argues that reality originates from human intellectual process. According to these perspectives, researchers choose a variety of enquiry methods to develop opinions towards establishing validity and generalizability. This paradigm war contributes to the gap between knowledge and practice in the field (Tsoukas, 1994) as it makes achieving a cohesive state of knowledge difficult. In addition, research designs differ across fields and not many randomized controlled trials are available in management research. As a result, EBMgt requires a more field specific grading scheme. Baba and HakemZadeh (2012) offer a theory of evidence more applicable to management research, which suggests that evidence derived from management research can be evaluated according to the effectiveness of the chosen research method and design, transparency of the data collection

and analysis, replicability of the study, consensus among similar studies, and careful inclusion of appropriate contextual and circumstantial factors. More specific frameworks and grading metrics can be designed for each subfield of management or for specific research questions. For example, McGrath (1964) suggests that the state of prior knowledge is a key factor in choosing an appropriate research method. Therefore, laboratory experiments and simulations are considered more suitable for testing existing theories, while qualitative field research is appropriate for proposing new theories (Lee *et al.*, 1999). Hybrid or mixed methods are beneficial for testing intermediate theories, and purely quantitative methods are useful in testing more established and mature theories in real organizational settings (Edmondson and McManus, 2007). The field specific evidence metric can also house action research, design science methods, and mode 2 knowledge generation research as more action oriented evidence (Kieser *et al.*, 2015). Therefore, the review team can customize a grading scheme based on a modified theory of evidence that considers the state of knowledge and theory of the particular review question.

Another important component of grading evidence is the evaluation of risk of bias associated with each study. Even randomized controlled trials have their own shortcomings that may lead to significant bias in results (Guyatt *et al.*, 2011) (e.g., accuracy of the blinding or randomization processes, methods chosen to address missing data, reliability and the validity of the measurements used in the studies, recruitment bias, and so forth). Therefore, while randomized controlled trials are considered the highest level of evidence, they are not equally trustworthy. Observational studies are also prone to bias due to inappropriate control groups, flawed measurements, incomplete follow-up, and so forth

(Guyatt *et al.*, 2011). Hence, the collaboration should provide the review team with a framework that enables researchers to assess the risk of bias of different studies. This tool should be objective and carefully distinguish between the quality of reporting and quality of executing a study in order to maintain consistency in the process of evaluating risk of bias (Greenland and O’rourke, 2001; Jüni *et al.*, 1999). Moreover, the tool should focus on internal validity rather than external validity and generalizability (Higgins *et al.*, 2011). Logically, the more high quality evidence with lower risk of bias is available regarding a particular research question, the more confidence one can have that the resulting systematic review will help decision makers make higher quality decisions.

In addition, due to globalization and the increasing integration of regional economies around the world, systematic reviews would benefit from a methodical comparison of different decision contexts. To facilitate this, the review team should first develop a framework for investigating the context of the managerial decision, identify important contextual factors, and then investigate whether the findings of the identified studies are affected by those factors or whether they are universal. For example, Johns (2006) identifies two different levels of context: omnibus and discrete. The former is based on a journalistic perspective that examines research as a story (Huff, 1999) being told in terms of who, where, when, and why, and the latter draws upon classic social and environmental psychology and defines contextual dimensions through physical, task, and social aspects. In systematic reviews and meta-analysis, context is considered to provide explanation for most variations in findings. Comparative research in particular provides a framework for investigating these variations. Adler (1983) identifies different approaches

for comparing studies based on various theoretical views, assumptions about universality, and methods for dealing with differences and similarities. For example, most management literature consists of single culture studies often conducted by North American scholars in a North American context. The single culture studies implicitly assume their results are universal. Consequently, they often fail to clearly investigate and report contextual factors and are not considered high quality evidence. Ethnocentric studies, on the other hand, are those that are originally conducted in one context (North America) and then replicated in another. They simply address the question of whether American managerial practices are applicable abroad. Although universality might not be the assumption of these studies, their aim is to extend the universality of findings. The third approach is Polycentric research, which is focused on exploring different management practices within specific contexts. Polycentric studies assume that the extent of differences between two contexts is so deep that institutions can only be studied in terms of their own unique situations (Adler, 1983). This approach is therefore concerned with both the similarities and differences across different contexts and can provide valuable input for systematic reviews as they simultaneously look for emergent universality and contextual specificity.

In addition to metrics for grading evidence and frameworks for comparing studies conducted in different contexts, the collaboration should foster communication and a relationship between academics and practitioners. Practice may be more inclined and receptive towards evidence-informed decision making through a platform for open communication that would assist both practitioners and researchers in sharing questions and ideas. It has been argued that communication across the practice-research gap is

difficult due to differences in interest, knowledge type, terminologies, and so forth and therefore both sides require certain communication and relational skills to overcome these barriers (Dutton and Dukerich, 2006). The collaboration must help facilitate this communication. Systematic review, as the final product of the collaboration, is one of the most important forms of information that should be communicated to practitioners.

In disseminating evidential knowledge in the form of systematic reviews, the format contributes significantly to their consumption by the knowledge users. HakemZadeh and Baba (under review) suggest that the format of systematic reviews should be based on the tenets of actionability in order to facilitate their implementation in decision making. The theory of actionability suggests that knowledge is actionable when it is conceptually clear, causal, operational, trustworthy, comprehensive, contextual, and comprehensible (HakemZadeh and Baba, under review). The format and template of systematic reviews should be consistent to allow for ease of interpretation. It should be based on the best practices in other fields, the unique characteristics of management knowledge, and the theory of actionability. The template should consist of title, introduction and background, methodology, related outcomes of interest, measurement, critics, operational issues, ethical and legal acceptability, cost effectiveness/utility analysis, side effects and unintended decision outcomes, and conclusion. These items in particular were selected and defined to reflect the notions of rigour, relevance, and actionability, to provide consistency in reporting evidence in systematic reviews, and to make the final report ready for implementation in the decision making process.

5.3.1. A template for systematic reviews

Title- Titles are considered important as they provide the first impression of a paper (Lin and Kuo, 2012). That said, there is scant guidance and instruction in publication manuals on how to write effective titles and why they matter (Ebel *et al.*, 2004). Because the intention of SRs is somewhat different than that of most academic journal papers, SR titles must follow a standard format that communicates the main question the SR intends to answer. It should meaningfully link who the review is about (the population), what the review is about (the intervention or practice), and what the achievable results (outcomes) are. For example, in a systematic review on job satisfaction, the title precisely indicates that employees' (population) job satisfaction can be increased (possible outcome) through mental challenge (intervention) (Judge and Klinger, 2000). Such standardization in title sets the tone for how the review is to be conducted as it provides better identification of relevant studies and decreases its complexity to a manageable scope by determining the keywords and general hypotheses that define the inclusion criteria. Moreover, this title framework addresses the core requirement of SRs, which is to make explicit and practical recommendations (Cook *et al.*, 1995). In addition, any recommended practice should specify the most important characteristics of the target population, department, product, or organization. For example, the Cochrane Collaboration requires the reviews to clearly describe in the title, not only the interventions but also the patients and treatment settings for which the intervention can be most effective (Van Tulder *et al.*, 2003). Careful contextualization and customizability of a review, both in title and content, significantly affect practitioners' intention to implement the recommended course of action (Lavis *et al.*, 2005).

Introduction and background- The main objective of the introduction section in SRs is to describe the problem addressed in the report. It sets the stage for the rest of the review through a brief conceptual presentation that emphasizes the significance of the problem under investigation (Cooper, 2009). The introduction section should address why the SR is needed and outline the importance of the problem and how it relates to important decision outcomes. In their systematic review on the effects of Compressed Working Week (CWW) interventions on health and work-life balance (WLB), Bambra *et al.* (2008) justified the need for an SR by explaining that the literature was under-utilized. The audience should understand why the answer to the investigated problem is not obvious and what “*hard facts, half-truths and absolute nonsenses*” (Pfeffer and Sutton, 2006) exist in literature. The practitioner audience will take notice once this clarification is made. In addition to defining the phenomena discussed in the report and the related terminology, the introduction of the SR can also include a theoretical, methodological, and practical history of the topic.

Methodology- In order to generate high-quality evidence, the SR involves three main functions: identifying all published and unpublished research, filtering and grading studies, and synthesizing data. It is the systematic process of identifying, including and excluding studies, and interpreting data that distinguishes SRs from traditional narrative reviews and common meta-analyses. In order for decision makers and researchers to trust the results of the SR, this process must be explicitly reported. For clarifying the process of identifying studies, reviewers need to briefly describe their search process, including a list of the keywords and phrases, the names of electronic and non-electronic databases and

search engines, and their procedures for identifying unpublished studies. In particular, as the validity of SRs depends greatly on an unbiased and complete identification (Dickersin *et al.*, 1994) of studies related to the review question, SRs should include unpublished studies in the identification stage. The relevant, identified research should then be appraised by reviewers. The SR must provide a general description of the final sample of studies in terms of the number of studies, type of industries and organizations investigated, and the timeframe in which data has been obtained. Following this, a method of analysis and synthesis will be selected with regards to the topic of the SR.

Related outcomes of interest- As a decision support tool, SRs should focus on the outcomes of its recommended intervention through meaningful and, preferably, objective metrics. These outcomes of interest may differ for managers in different fields and at different organizational levels. For example, in human resources, managers may look into organizational level outcomes of their decisions including shareholder returns, profit, organizational survival, productivity, and customer complaints (Becker and Gerhart, 1996), or look into individual and team level outcomes such as job performance and counter-productive work behaviors. Marketing managers may be more interested in outcomes such as sales growth, market share, profitability, competitive position, and customer satisfaction, to name a few (Kaynak, 2003; Keh *et al.*, 2007). It may be beneficial for reviewers to carefully identify and categorize these different outcomes as they proceed with identifying relevant studies for SRs. Common categorizations are based on level of outcomes (organizational, individual, departmental), financial and non-financial nature of outcomes (profit vs. job security), and long-term or short-term outcomes. Therefore, in this section

of the SR, the estimated relationships between the recommended interventions and these outcomes need to be listed. As space constraints and audience preferences will dictate how in-depth this section will be, listing only the most important or most probable outcomes in a one-page take-away and then providing more details in the executive summary and the detailed report itself is a possible direction for the outcome section.

Measurements- In organizational studies, interventions and managerial decisions are based on certain measurements of characteristics, attitudes, behaviors, culture, and other aspects of the internal and external environment. These measurements are paramount in the decision-making process as they help managers make sense of the problem and the context in which it exists, and are also essential tools in the research process and knowledge generation. Key points regarding the measurements related to the practice under investigation in SRs include the established measurements in the field, their validity and reliability, their availability, and cost of implementation.

Critiques- Opposing views on a certain practice or solution to a problem and debates on the effectiveness of an intervention are common, although there are situations where the evidence is so strong that researchers claim there is no room for debate (Schmidt, 2002). SRs do not solely aggregate results of different studies; they synthesize various research findings in a judicious and critical manner, and tend to present disagreements on the degree of effectiveness of different interventions.

Operational issues- What often makes managers hesitant to rely on research findings is the limitations imposed on the generalization of managerial theories and practices. It can be argued that by its nature, management knowledge is contingent, and

effectiveness of different interventions and practices is influenced by contingent and contextual factors that call for closer attention when study results are aggregated and synthesized into SRs. In research these contingencies are investigated as moderating variables that can enhance or diminish the effectiveness of a particular practice.

The idea that managerial practices are not equally effective under all conditions is not new (Galbraith, 1973). Emphasizing this issue in conducting and reporting SR enhances its quality and increases its validity. In effective reporting of these moderating effects, different subfields of management must develop their field specific contingency frameworks. Such an explicit framework will facilitate the review process at its various stages of searching for relevant studies, synthesizing results and interpretations, and drawing conclusions.

Ethical and legal acceptability- Ethics are said to be the foundation of good management practices (Mellahi *et al.*, 2010). Moreover, every organizational activity is influenced and regulated through different legal systems. Therefore, ethical and legal considerations play important roles in the process of decision making (Loe *et al.*, 2000). In the current context, managers and organizations are increasingly expected to be honest and follow ethical standards (Carroll, 2000). Businesses now operate on a global scale. They either have customers or clients located in other countries or have facilities abroad. This reality exposes managers to culture-dependent ethical dilemmas and different regulatory systems that are more complex and unique (Schwartz *et al.*, 2012). Diversity in the workforce also brings new ethical challenges to the table for decision makers (Harvey, 2011)., Moreover, the notion of corporate social responsibility requires managers to

evaluate not only the economic, but also the legal, ethical, and philanthropic consequences of their decisions (Carroll, 1979). Corporate social responsibility issues have even influenced core management theories such as agency theory, institutional theory, the resource-based view of the firm, and stakeholder theory (Lindgreen and Swaen, 2010). Even in an evidence-based decision-making approach, a manager may reweigh alternatives and decision options based on their ethical, social, and legal acceptability (Baba and HakemZadeh, 2012). While individual awareness of ethical dilemmas, moral intensity of the situation, and many organizational factors contribute to the final decision choice, research can also play a vital role in disseminating practice-relevant ethical and legal knowledge to practitioners. In order for SRs to be actionable, these aspects of decision making must be considered in the review process. For example, electronic monitoring practices may be effective and have benefits for customers, society, and organizations, but may raise some ethical and legal concerns such as dehumanizing the work place and invading employees' privacy (Alder, 1998), which can then produce increased stress and worsened health conditions, in turn adversely affecting performance and productivity (Alder, 1998). Another example is information privacy, which is becoming increasingly important for many organization stakeholders, mainly as a result of the growing online information sharing occurring in day-to-day business transactions (Smith *et al.*, 2011). In some sub-disciplines of management there is still lack of knowledge about the immediate ethical consequences of managers' decisions and how they can influence organization's reputation and performance (Eltantawy *et al.*, 2009).

Of importance is that every study used in SRs must adhere to standard ethical guidelines for the research in the field. Ethically sound research methods affect both the reliability of the data and validity of the findings (Bryman, 2012), which are core components of SRs. These guidelines must be addressed at all stages of the review process. In the stage of problem formulation, understanding the legal system in which the decision is going to be made helps determine critical decision limitations. In the search and selection stages, the related ethical and legal issues set specific selection criteria that enhance the quality of the review. Furthermore, any recommended intervention made at the conclusion stage should be accompanied with possible legal and ethical implications to make the SR actionable.

Cost effectiveness/utility analyses- SRs in healthcare are increasingly investigating and reporting the cost-effectiveness and clinical effectiveness of different interventions (Moher *et al.*, 2009). This approach applies to SRs in the fields of management and organizational studies, particularly because decision makers' main concern in organizations is to link individual practices to overall organizational performance and other measurable outcomes. While there is research regarding how efficacy and cost-effectiveness of different managerial practices can be measured, the knowledge must still be synthesized with effectiveness analysis and reported and disseminated to practitioners through SRs.

Side effects and unintended decision outcomes- In the process of decision making and in the aftermath of evaluating its outcomes, it is not uncommon for managers to face unexpected and unintended consequences. In the literature these are sometimes referred to as post-decision surprises (Harrison and March, 1984). Most of our knowledge regarding

this phenomenon looks at uncontrollable external factors or catastrophic events that affect decision outcomes (Eastburn, 2009). However, many decision surprises are direct results of the decision itself and are causally related to the implemented intervention or its under- or over-prescription. Computer- Mediated Communication (CMC) provides an example. Besides being a cost effective mode of organizational communication that overcomes the physical proximity limitation, CMC reduces social boundaries and removes group pressure and social influence resulting from status and power gaps. However, it can also create a virtual environment with an increase in antisocial behaviors and other unintended consequences (Hiltz *et al.*, 1989). It is therefore important for SRs to acknowledge the complexity of organizational phenomenon and the possibility of negative side effects of decisions as the causal relationships between interventions and their outcomes are not always “simple, transparent and bi-directional” (Crozier and Thoenig, 1976).

Conclusions- As the purpose of SR is to facilitate decision making, the review should provide a clear statement of the findings. This conclusion does not necessarily recommend a course of action to managers and decision makers; rather, it provides a description of the state of knowledge on the effectiveness of a managerial practice or understanding of an organizational and business related phenomenon. It is often mentioned that cultural differences, economic contingencies, and personal and societal values and preferences result in different decisions based on the same evidence (Higgins and Green, 2011). The model of evidence-based decision making suggests that the preferences of managers, stakeholders, contextual factors, and even ethical and legal considerations affect the outcome of evidence-based decision making (Baba and HakemZadeh, 2012). An SR

communicates the state of management knowledge on the SR title and question, which is mainly determined by evaluation of the quality of evidence available on that particular subject. If for any reason the quality of available evidence is not satisfactory, reviewers may also be required to offer some explanations. For example, with respect to the dimensions of quality of evidence mentioned before, evidence may be graded low because of poor methodological fit due to limited research methods and knowledge to design and implement studies. Moreover, there may be some issues over consensus and degrees of heterogeneity and inconsistency between different results that can neither be explained through sub-categorical data synthesis and meta-analysis nor justified through moderating effects of other variables.

The suggested template makes no claims that it addresses the point of view of all stakeholders. The objective is to initiate a process by which systematic reviews can further evolve and mature, ultimately enhancing the value of the knowledge researchers deliver to practicing managers. Briner and Rousseau (2011) stated that the objective of a systematic review is not to generally summarize research findings on a certain issue, but to evaluate the effectiveness of a certain managerial intervention. In the field of management, most academic publications include only a short passage on the practical implications of their research, and while many journals request authors to consider these practical implications, the section is usually brief and addressed late in the overall discussion of research (Doh, 2010). In a systematic review however, the actionable aspect of the research guides the way it is produced.

Regarding the format of systematic review, preparation of a one page standalone summary in plain language along with the full text of the report is recommended to increase the accessibility of research finding for decision makers (Higgins and Green, 2011). This format is more accessible for managers with limited time to read research reports (Retsas, 2000). A common checklist of items to be included in this summary (Table 5-1) helps to standardize systematic review reports and the review process. This checklist also ensures that the findings are replicable. Much of the provided information in a systematic review report is necessary for evaluating the reliability and validity of the findings (Plint *et al.*, 2006). The strength of the proposed template is that the components are derived from the dimensions of actionability. It facilitates the codification of the best available evidence into a systematic review that can be readily used by a manager at the point of decision. Hence we propose:

P9: Generating evidence involves assembling the community, developing the template and appropriate indices of rigour, relevance, and actionability, and deciding on the format and language for producing a systematic review of the best available evidence.

P10: The evidence-based collaboration will finesse the research question, seek, collate, assess, and process information to produce a systematic review of the best available evidence using a standardized template, and make it accessible in a readily usable format.

Table 5- 1- Itemized checklist for Systematic Reviews

Section	Recommended items
Title	<input type="checkbox"/> Managerial practice <input type="checkbox"/> Context (population, department, product, etc.) <input type="checkbox"/> Intended outcome
Introduction and background	<input type="checkbox"/> Problem description <input type="checkbox"/> Justification of the need for SR <input type="checkbox"/> Definition of terminologies
Methodology	<input type="checkbox"/> Method(s) used for study identification <input type="checkbox"/> Method(s) used for filtering studies (e.g., research methods, risk of bias, grading) <input type="checkbox"/> Method(s) used for aggregating results and data synthesis
Related outcomes of interest	<input type="checkbox"/> Long-term and short-term outcomes of implementing the managerial practice <input type="checkbox"/> Outcomes of interest at different levels <input type="checkbox"/> Extent to which the managerial practice is believed to be a cause of each mentioned outcome
Measurements	<input type="checkbox"/> How each important constructs involved in the decision process are measured <input type="checkbox"/> Validity, reliability, availability, and cost of each measurement
Critics	<input type="checkbox"/> Significant disagreements on the effectiveness of the managerial practice
Operational issues	<input type="checkbox"/> Important limitations to generalization <input type="checkbox"/> Important moderating variables that can enhance or diminish implementation of the managerial practice
Ethical and legal acceptability	<input type="checkbox"/> The known legal considerations of the managerial practice <input type="checkbox"/> The known ethical considerations of the managerial practice
Cost effectiveness/Utility analysis	<input type="checkbox"/> Objective measurements related to decision outcomes <input type="checkbox"/> Cost of implementing the managerial practice <input type="checkbox"/> Effects of the managerial practice on measurable organizational performance criteria
Side effects and unintended decision outcomes	<input type="checkbox"/> Possible negative outcomes of over- and under-prescription of the managerial practice
Conclusion	<input type="checkbox"/> Grade of evidence on the subject (high, moderate, low, and very low) <input type="checkbox"/> Reasons for the reported grade of evidence <input type="checkbox"/> Authors' final conclusion

The existing evidence-based collaborations (e.g., Campbell and Cochrane) utilize online libraries that include summaries of high quality evidence and systematic reviews. Moreover, they identify areas of interest and expertise of professional managers through membership information, and take a more proactive approach towards evidence dissemination by directly sending relevant systematic reviews to practitioners (Walshe and Rundall, 2001). Dissemination strategies often involve a source-based method that pushes evidence from researchers to the end users. This dissemination method, supported by diffusion theory (Rogers, 2010) and a technology transfer model (Backer *et al.*, 1995), is similar to many marketing approaches in which the dissemination process involves concept development and testing, production and packaging, and distribution. Traditional methods of publishing research in journals and textbooks or direct mail or email of evidence to interested practitioners are common dissemination practices based on the source-based strategy. User-based dissemination strategies place more focus on the needs of knowledge consumers and base dissemination strategies on users' awareness, selection, adoption, and implementation. Training and awareness workshops and role modeling exercises for practitioners can be categorized as user-based strategies. Wandersman and his colleagues (2008) suggest an interactive systems framework that combines these strategies and propose an infrastructure that supports these dissemination methods. Their framework consists of three different functions of purifying evidence and translating it into a consumable form, capacity building and providing training to practitioners, and offering support in the implementation stage. While these suggestions make logical sense, there is little research to support their effectiveness (Kerner *et al.*, 2005). Further research is

required in order to tailor these strategies to management research and a decision-making context and to empirically test their effectiveness.

In addition, an interpersonal connection between academics and practitioners through knowledge brokers can further facilitate effective distribution of evidence (Lomas, 2007). For example, the collaboration can develop online forums to allow academics and practitioners to discuss mutually interesting topics. EBMgt collaboration can also promote the practitioner-academic relationship through boundary spanners (Gulati, 2007) or knowledge brokers (Thompson *et al.*, 2006). These are individuals who consider themselves both academics and practitioners and are greatly involved in both roles (Bartunek, 2007). It is suggested that knowledge brokers can be hired by the collaboration, research institutions, funding agencies, consulting firms, and business organizations in order to perform functions such as training consumers of knowledge, increasing their openness to evidence and their capacity to absorb it (Morley, 2006), translating evidence into plain language or making it compatible with the jargon of their organizations, and supporting interaction between researchers and practitioners. This approach, also known as “linkage and exchange” is based on the assumption that face-to-face interactions (Lomas, 2000) and dissemination strategies that involve networking and partnership (Greenhalgh *et al.*, 2004) can narrow the gap between research and practice. Empirical work on the impact of knowledge brokers suggest that while the knowledge broker dissemination approach is time consuming, it results in a better understanding of the decision-related issues and evidence (Lyons *et al.*, 2006). Therefore we propose:

P11: The collaboration will make evidence available online to practicing managers, train users in evidence-based management, and promote the practice of evidence-based management in the profession.

Figure 5-2 shows the process of evidence-based management enabled by a formal ongoing collaboration among management researchers who produce knowledge through rigorous research, editors and reviewers who attest to the quality of the research and its relevance, and managers who judge its actionability and make use of the research variously. The nature of the collaboration promotes the coherence of rigour, relevance, and actionability toward the enhancement of management knowledge value. This knowledge, guided by a theory of evidence, is curated as such and includes indications of its strength (Baba and Hakemzadeh, 2012). The evidence is codified into a systematic review using the template we have proposed. The systematic review is made available online to a practicing manager at the time of need for use in management decisions.

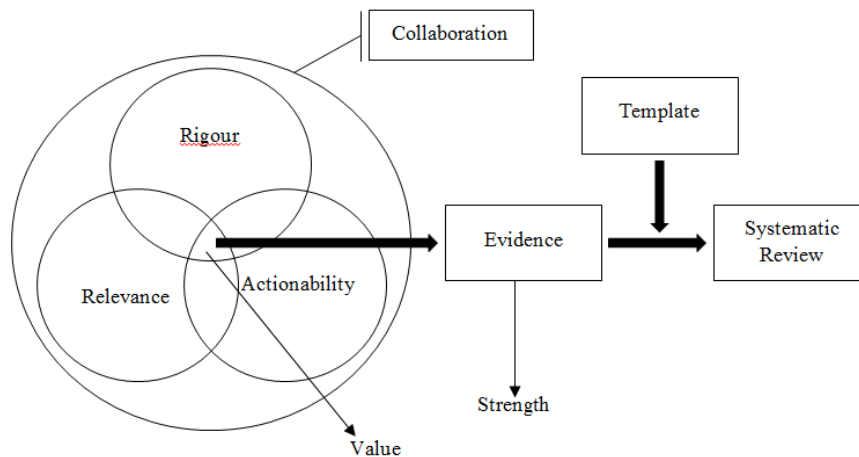


Figure 0-2- Evidence-based management process enabled by the Collaboration

5.4. Discussion

In the quest to narrow the gap between management knowledge and practice, generating actionable evidential knowledge and effectively disseminating it to knowledge users is essential. The scope of these activities is beyond that of the traditional self-governed academic knowledge generation system that relies solely on peer review process and has no systematic means of accumulating the generated knowledge or effectively linking it to practice. Based on the experiences of other academic fields, such as health care and policy making, and on existing frameworks and theories of EBMgt, we explored the notion of evidence-based management collaboration and its different roles in evidence generation. In particular, we envision the EBMgt Collaboration to be responsible for promoting the principles of evidence-based management, inculcating trust in evidence through publishing relevant, rigorous, and actionable systematic reviews, and for effectively disseminating said systematic reviews.

To effectively perform these tasks, EBMgt requires several tools and frameworks, such as a collaborative data management and analysis software to support the generation of systematic reviews, a metric to evaluate evidence, a yardstick for evaluating risk of bias, a template for conducting comparative analysis and clarifying the source of variation in studies, an outline for reporting systematic reviews, and so forth. While some of these frameworks and metrics are already developed, EBMgt can certainly benefit from further investigation into tools and methods that can facilitate its operation and effectively close the gap between management knowledge and practice.

Our intention here is to contribute to the debate on how to close the gap between management research and its practice. We believe that an ongoing collaboration among the various stakeholders of management knowledge will facilitate that closure. To that end we offer a Systematic Review as an approach for its implementation, along with the Template and a theory of collaboration that sustains and guides the process.

To summarize, we argue that evidence is at the heart of evidence-based management and is generated through collaboration. In order for evidence-based management to guide the management profession, we need an active, ongoing collaboration among the producers, arbiters, and users of evidence-based knowledge. Such knowledge is developed through management research, application of research findings, contextual information and fit, best practice heuristics, ethical frameworks developed through practice, statistical and narrative reviews, and an ongoing assessment of their value. Value of the evidence is enhanced through a fusion of rigour, relevance, and actionability. A global collaboration will engage significant producers of theoretical and empirical knowledge, significant arbiters of theoretical, empirical, and practical knowledge, and users of such knowledge in the best available combination. The collaboration will generate and disseminate such knowledge in the form of systematic reviews of research questions deemed to be of value to management practice. In that pursuit, the collaboration will seek community guidance on research questions of value through a mechanism of continuous exchange. It will commission systematic reviews to a team of scholars and practitioners knowledgeable in the domain of the research question to first finesse the research question, and then seek, collate, assess, and process information pertaining to the research question,

produce a systematic review of the best available evidence using a standardized template, and finally make it accessible in a readily usable short and long format, online and available to a practicing manager. It will involve assembling the community, developing the template, appropriate indices of rigour, relevance, and actionability, deciding on the format and language for producing a systematic review of the best available evidence, making it available online to practicing managers, training users in evidence-based management, and promoting evidence-based management in the profession.

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Chapter 6: Conclusion

The failure to effectively translate academic knowledge for practical consumption have been repeatedly voiced by prominent management scholars (Bartunek, 2003; Cummings, 2007; Hambrick, 1994; Rousseau, 2006). Researchers have demonstrated the large extent of the divide between research and practice in different subfields of management (Arnold & Hatzopoulos, 2000; Benbasat & Zmud, 1999; Hollenbeck, DeRue, & Guzzo, 2004; Inanga & Schneider, 2005; Rynes, Colbert, & Brown, 2002) and have proposed a number of ideas to narrow the research - practice gap . First, it has been suggested that academics should simplify their arguments, use less jargon, and publish articles in bridging journals to close the divide between research and practice (Choudhury, 1986; Cohen, 2007; Hambrick, 1994; Ryan, 1977). Second, it was proposed that research methods such as action research, design science, and mode 2 knowledge generation may be effective in producing practically useful knowledge. Action research focuses on local problem solving through participative research that involves researchers in identifying organizational problems (Coghlan, 2011; Foster, 1972; Levin & Greenwood, 2001; Reason, 2006). Mode 2 knowledge generation advocates the involvement of various stakeholders in the process of knowledge production and integrating practitioners into the peer-review process (Huff, 2000; MacLean, MacIntosh, and Grant, 2002; Mohrman, Pasmore, Shani, Stymne, and Adler, 2008; Salipante and Aram, 2003; Van de Ven, 2007). Design science questions the adequacy of natural science approaches to developing practically useful knowledge and suggests adopting a design mode which focuses on whether or not a certain

intervention is effective, as opposed to its truth value (van Aken, 2004; Pascal, Thomas, & Romme, 2013; Romme, 2003; Romme and Endenburg, 2006).

This dissertation argues that, to some extent, all these perspectives are right and each one is tackling a certain aspect of the problem in order to achieve a better state of research-practice relationship in the field. However, from the point of view of the author, Evidence-Based Management (EBMgt) suggests a more comprehensive approach to enhancing the quality of managerial decisions and closing the research-practice gap that encompasses many of the other recommendations and approaches mentioned above. Arguing that the main cause of the problem is the inefficient state of the market of management ideas, theories, and research (Pfeffer and Sutton, 2006), proponents of evidence-based management suggest that practically useful management knowledge can be generated through systematic collection and synthesis of *evidence* which can be codified and disseminated to the end user. (Briner, Denyer, and Rousseau, 2009; Denyer, Tranfield, and Van Aken, 2008; Rousseau, 2006; Rousseau, Manning, and Denyer, 2008). The EBMgt's significant advantage compared to the other approaches is that it has evidence-based medicine as a successful model that has been able to enhance decision quality and decision confidence in health care. Although the fields of management and medicine have clear differences in terms of research culture, research questions, design, research goals, and so forth (Tranfield, Denyer, and Smart, 2003), the basic philosophies and techniques of evidence-based medicine can help us with valuable insights toward the pursuit of evidence-based management. As Rousseau said, "we have a very long way to go to make management practice evidence-based" (2012, p. vii). After all, it took medical science,

equipped with much clearer research goals, epistemological and ontological stands, and research designs more than 200 years to develop its current normative standard for professional practice and it has adopted the evidence-based approach only in the last 50 years (Sur & Dahm, 2011). This dissertation advocates that all management practices should be evidence-based. To that end it offers theories, models, test, and a template to enhance the theoretical and empirical stand of EBMgt. Figure 6-1 depicts an overview of its contributions. The model of evidence-based decision making explores how evidence is considered a key input in the decision making process. The theory of evidence proposes a framework for evaluating the quality of this input. We also argue that, in addition to being rigorous and relevant, useful evidence should also be actionable and therefore we offer a theory of actionability that explains the attributes of actionable management research. The theory of collaboration advocates a knowledge production mechanism that can bring qualities of rigor, relevance, and actionability together. As a good example of a research method that can result to such qualities, we propose a template for reporting systematic reviews in management.

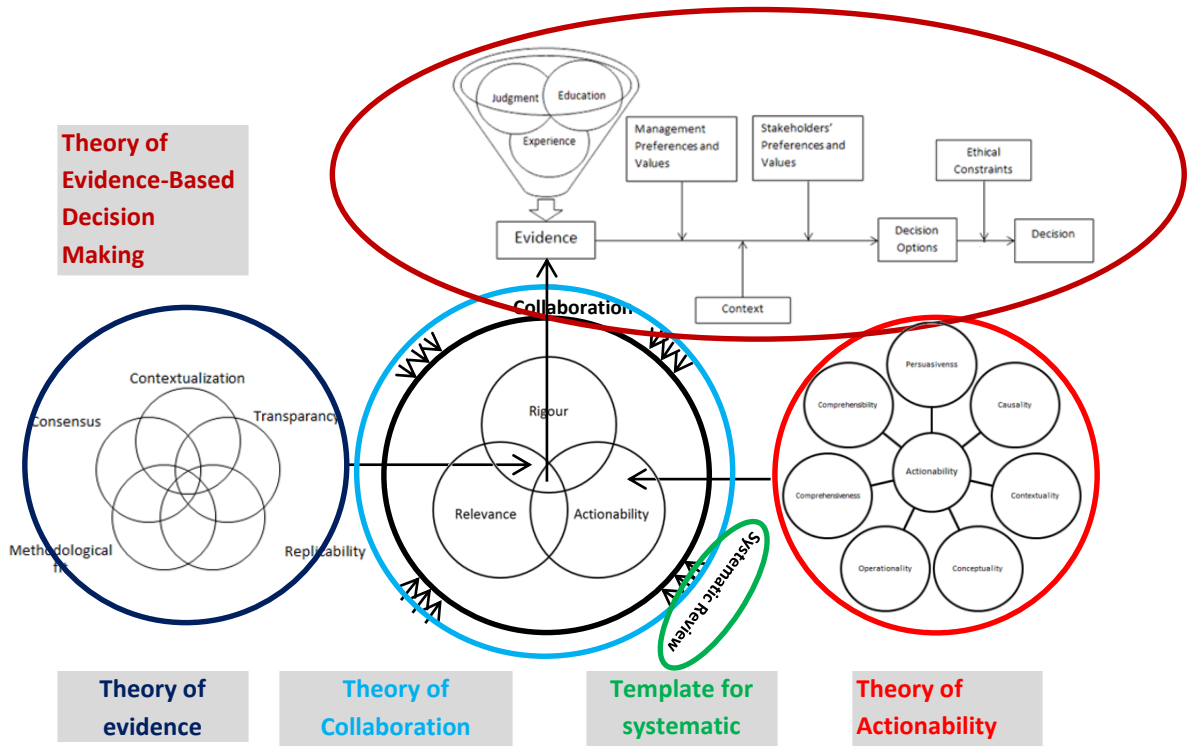


Figure 6-1- Overview of the dissertation

Chapter 1 provides a critical evaluation of the EBMgt literature and takes a closer look at the process of evidence-based decision making. In particular, it addresses the common concern that the requirement of formal evidence is going to replace managerial wisdom, experience, and insight. It shows how the decision process and implementation of evidence are affected by the preferences and values of managers and other stakeholders, the context, ethical and political constraints. It then tackles a fundamental question: What is evidence? Generally speaking, evidence is any piece of relevant knowledge produced - at universities, public or private organizations, consulting companies, and so forth. However, these pieces of evidence cannot be equally trusted and used as the basis for

management decisions. In evidence-based medicine, different hierarchical grading schemes exist that accord systematic reviews of homogeneous randomized controlled trials the highest grade of evidence (Evans, 2003). At lower levels there are individual randomized controlled trials with narrow confidence intervals, non-randomized controlled trials, systematic review of cohort studies, case studies, and expert opinions. Critics, assuming that evidence-based management movement seeks to adopt a similar grading scheme, often argue that randomized controlled trials are not common or even plausible in management, and consequently, evidence-based practice principles do not apply to the field (Reay, Berta, and Kohn, 2009). Chapter 1 offers a theory of evidence that proposes a non-hierarchical grading framework for evaluating the quality of different pieces of evidence in management research. This framework suggests that evidence is stronger when it is acquired through an appropriate research method and a process that is transparent and replicable. Furthermore, the more evidence includes contextual factors and the more consensus exists over its findings, the stronger it is. Chapter 1 also identifies the process by which management evidence-based decisions are made and offers a model for evidence-based decision making.

Looking into how different pieces of evidence can be aggregated together this thesis looks into the notion of actionability as suggested by Pearce and Huang (2012). Actionability is defined as the extent to which research can be implemented into decision making (Bartunek and Egri, 2012). This concept seemed to be confused with the notion of relevance in the literature. However there are lots of research findings that are relevant but not actionable. It is relevant to know that smarter people perform better, but this has no actionable value if one is not able to articulate practices through which managers can

identify, select, hire, and retain smart people. These lead to the observation that in order to enhance the quality of evidence rigor and relevance are necessary, but not sufficient. To elucidate the concept of actionability, Chapter 2 proposes a theory of actionability. It is also clarified why EBMgt argues that actionable knowledge cannot be achieved through one single study. A systematic review of all the available evidence is called for as the ultimate research method that can help us narrow the research-practice gap.

Chapter 3 offers an empirical index of actionability derived from the the theory of actionability. A study specifically designed for this purpose identifies the characteristics of research that is believed to be actionable by producers (researchers), disseminators (editors and members of editorial boards of influential management journals), and users (practicing managers) of management research. The commonalities in the frame of reference of these three groups were probed and documented as it would give us some guidance on how to synthesize and aggregate the available knowledge and position it on a common platform of rigor, relevance, and actionability. The results largely confirmed the theoretical stand taken in chapter 2: practically useful knowledge is the one that is rigorous, relevant, and actionable.

In the fourth chapter of this thesis, the theories of evidence (Chapter 1) and actionability (Chapter 2) and the results of the empirical study (Chapter 3) are integrated into a model of evidence-based management collaboration in order to answer the question of how rigorous, relevant, and actionable research can be conducted, codified, and communicated. The collaboration is conceived as an independent organization that collects

and grades rigorous and relevant individual pieces of evidence, aggregates and synthesizes them to form an actionable whole, and effectively translates and disseminates them to different knowledge users. The research that is conducted and codified by the collaboration needs to be made available to practicing managers. In the concluding section of this chapter, a theory-based Systematic Review is proposed that not only codifies the research but also assesses its usefulness to practice. Finally, to facilitate and streamline the process of preparing a systematic review, a template is designed.

This dissertation contributes to the literature of EBMgt by proposing a theoretical framework for its core concept: evidence. Moreover, it offers a model for EBMgt decision making that acknowledges the role of managers' experience, education, and preferences along with the preferences of other stakeholders, contextual factors, ethical and political constraints. Furthermore, this dissertation contributes to the research-practice gap literature by proposing the need for actionability in addition to the need for rigour and relevance, and by exploring its empirical viability. Finally, based on the theories of evidence and actionability this thesis offers a template for systematic reviews that can facilitate the operation of evidence generation and communication.

The proposed theories are not without limitations and they certainly require future research and verification. Limitations of each theoretical framework and empirical study are discussed in details at the end of each chapter. In particular, the theory of evidence and actionability need to be further tested in terms of their validity and reliability in assessing different pieces of research in different subfields of management. Studies are needed in

order to compare the quality of decisions based on systematic reviews to those based on other forms of research or on pure managerial experience. Moreover, the template for systematic review itself should be tested and improved.

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