

Pertti Järvinen

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for identifying research gaps in
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UNIVERSITY OF TAMPERE
SCHOOL OF INFORMATION SCIENCES
REPORTS IN INFORMATION SCIENCES 49

TAMPERE 2016

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SCHOOL OF INFORMATION SCIENCES
REPORTS IN INFORMATION SCIENCES 49
DECEMBER 2016

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FIN-33014 UNIVERSITY OF TAMPERE

ISBN 978-952-03-0333-4

ISSN-L 1799-8158
ISSN 1799-8158

On lenses and their improvements for identifying research gaps in literature review

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Abstract

Literature reviews play an important role in a researcher's preparation of research problem. In order to find out a gap between what we already know and what we like to know, a researcher can utilize not only concepts (Webster and Watson 2002) but also classifications in performing literature review. It is assumed that a higher order framework can be unpacked into classifications. A classification consists of classes of a dimension, and classes can be concepts (variables). It will be shown that it is possible to derive some guidelines how to improve classifications for identifying research gaps in literature review.

Key words: literature review, gap, classification, lens

Introduction

According to Rowe (2014, p. 243) "a literature review synthesizes past knowledge on a topic or domain of interest, identifies important biases and knowledge gaps in the literature and proposes corresponding future research directions" and Webster and Watson (2002, p. xiii) motivate for performing it as follows: "a review of prior, relevant literature is an essential feature of any academic project. An effective review creates a firm foundation for advancing knowledge". They describe that a literature review can be concept-centric or author-centric (ibid. p. xvi). The latter method, however, fails to synthesize the literature. In addition some authors have selected a lens-directed approach. Jasperson et al. (2002) is one of the first papers where lenses are used. Actually they use two sets of lenses, but an individual lens is a concept. When a concept divides a reality into two parts, those belong to the domain of a certain concept and those that do not belong, a concept is not very powerful tool to differentiate things. Rowe has long thought about stronger conceptual tools for literature review. In his 2012 editorial he concludes that "in order to analyze the phenomenon and get interesting results, researchers need to have a good conceptual framework, not necessarily a theory, but a set of coherent macro-concepts. This conceptual framework will help them to analyze theoretically the dimensions of each concept and thus code the data." (Rowe 2012, p. 471). Two years later he states that "a review that is using an original and relevant analytical lens is very likely to lead to the identification of knowledge gaps and theoretical bias." (Rowe 2014, p. 251) We in this paper explain how multidimensional constructs of a conceptual framework can be unpacked into more fine-grained classifications to review a domain of literature. We shall use a classification of a particular dimension as a lens and we can then achieve a more differentiating power than a concept as a lens. Our purpose is to show how lenses can be used to identify research gaps.

It is fundamental to all research to carefully formulate grounded research questions. Sandberg and Alvesson (2011) propose a taxonomy of ways to constructing research questions. Their findings suggest that the most common way of producing research questions is to spot various gaps in the existing literature, such as an overlooked area and, based on that, to formulate specific research questions. Gap-spotting is of course not something absolute but varies in both size and complexity: from incrementally extending an established theory to identifying more significant gaps in the existing literature.

According to Sandberg and Alvesson (2011) gap-spotting questions are unlikely to lead to significant theories because they do not question the assumptions which underlie existing literature in any substantive ways. In other words, gap-spotting is more likely to reinforce or moderately revise, rather than challenge, already influential theories. Instead of their criticism gap-spotting questions is the mostly way to develop research questions, and we cannot bypass it.

Sandberg and Alvesson (2011) provide four ways to spot gaps and to go beyond gap-spotting. They do not give much help how the latter could take place. We shall in this paper develop rules and opportunities as improvements of lenses and they seem to show some movements towards the direction that Sandberg and Alvesson prefer.

Literature review is not a simple task but has at least 9 review types (Paré et al. 2015) from that only some are preferring gap-spotting. For these review types we prepared an algorithm (Figure 1) to show where are lenses used and where our contributions (marked by **bold**) arose. We shall explain our algorithm line by line and in that way give an overview picture our context.

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01 IF a topic to be studied is nascent
02   THEN use the concept-centric literature review
03   ELSE decide whether you like to perform your
04   literature review by using either the concept-centric
    approach
05   or a lens-directed approach
06   IF you follow the latter
07     THEN select an initial lens (classification) concerning
    topic and
08         perform literature review by classifying studies
    belonging to
09         topic into proper classes of the lens
10     IF the lens shows any gap
11     THEN use this gap in problem definition and

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12             solve the problem by using empirical
data
13     ELSE improve the lens by using
14             Guidelines A, B, , , E
15             and use a new gap in problem definition and
16             solve the new problem by using
empirical data

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Figure 1. An algorithm to locate our contribution

In Lines 1 and 2 we pay attention to the fact that "theory in management research falls along a continuum, from mature to nascent. Mature theory presents well-developed constructs and models that have been studied over time with increasing precision by a variety of scholars, resulting in a body of work consisting of points of broad agreement that represent cumulative knowledge gained. Nascent theory, in contrast, proposes tentative answers to novel questions of how and why, often merely suggesting new connections among phenomena." Edmondson and McManus (2007, p. 1158) In nascent case we have fewer chances to find a good enough lens and we therefore recommend use of concept-centric approach (Järvinen 2008).

In Lines 3 - 5 we describe how a researcher selects either concept-centric or lens-directed approach, and if she follows the latter (Line 6) she should then select an initial lens (Line 7) and perform literature review by classifying studies belonging to topic into proper classes of the lens (Lines 8 and 9). If the lens shows gap then use this gap in problem definition and solve the problem by using empirical data. (Lines 10-12).

If a researcher do not find a gap when all the studies are classified into the classes of the initial lens, she must then improve the lens (line 13). here we have our motivation to the study of this paper and we can present **our research problem**:

Which kinds of guidelines to improve a lens can we find by analyzing the lenses used in the literature?

We have in our formulation described that our approach will be an analysis of the lenses used in literature reviews. Our contributions will be five guidelines:

Guideline A: If a differentiating principle does not stay permanent during unpacking of a tentative dimension, divide a tentative dimension into two or more independent dimensions.

Guideline B: If a set of classes is not exhaustive, you can add a new class into a classification.

Guideline C: You can change underlying assumptions whenever it is interesting and promising.

Guideline D: If the classes are not pairwise disjoint, you can achieve such classes by dividing a certain class into subclasses. The dividing process can be repeated as many times as needed.

Guideline E: You can add a new dimension whenever needed.

We shall use a famous literature review of Jasperson *et al* (2002) as a context of our analysis. Our purpose is not to criticize results achieved by Jasperson *et al* and hence their outcomes (7 metaconjectures) are still valid and applicable. We shall thereafter analyze two other lens-directed literature reviews: Elgarah *et al.* (2005) and Besson and Rowe (2012). The former shows how often researchers have deficiencies in their classifications. The latter shows how an exceptional known class (not any new class) in Besson and Rowe (2012) can need an extra study, i.e., an exceptionally small number in this class (economic) can be interpreted as a gap. We shall then discuss applicability of our five guidelines, and we shall also relate them with Sandberg and Alvesson's modes of gap-spotting and with their four ways to go beyond. Finally we shall discuss implications of our results to science, limitations of our study and what should be studied in the future.

Analysis of Jasperson et al. (2002) for seeking rules and opportunities to support gap-spotting

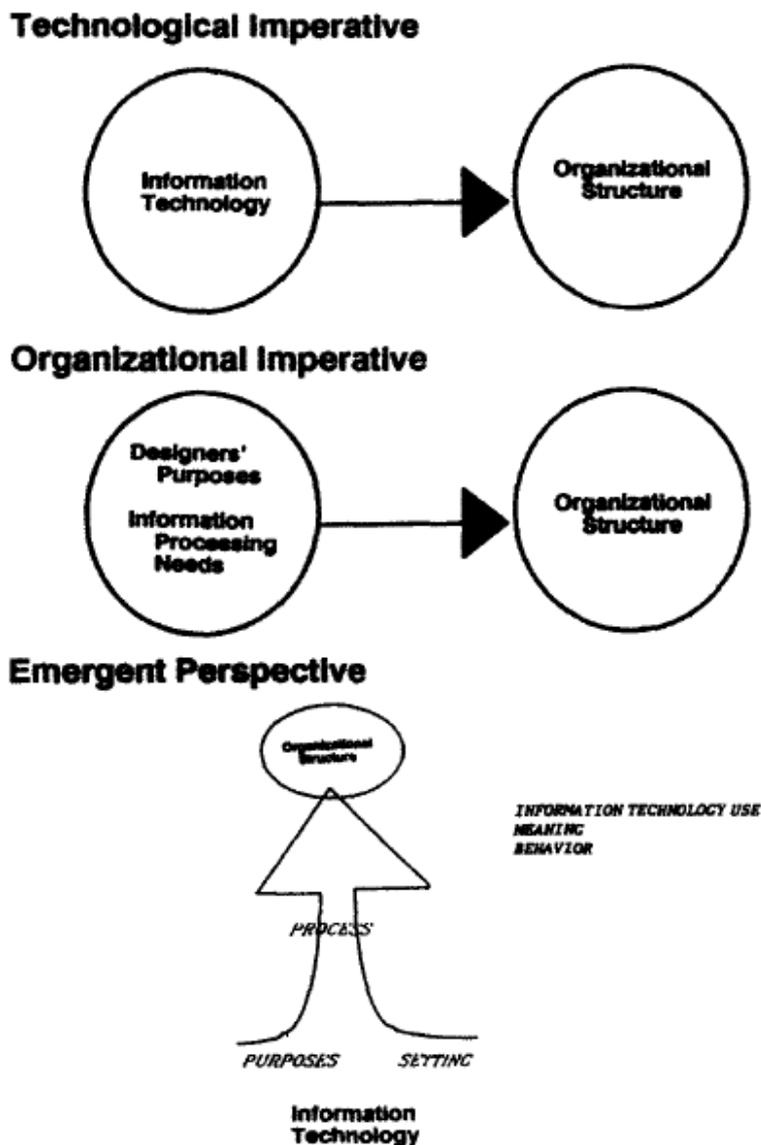
In this section we shall analyze Jasperson *et al*'s (2002) literature review where two frameworks (Markus and Robey 1988 and Bradshaw-Camball and Murray 1991) were used in collecting and organizing earlier studies to find out metaconjectures. The reason is that those two frameworks seem to look like good classifications. We also here like to repeat that we are using Jasperson *et al* (2002) as a context of our analysis.

Jasperson *et al* (2002) explored the relationships between power and information technology impacts, development or deployment, and management or use in a sample of 82 articles from 12 management and MIS journals published between 1980 and 1999. They explored the multiple paradigms underlying this research by applying two sets of lenses to examine the major findings from their sample. The technological imperative, organizational imperative, and emergent perspectives (Markus and Robey 1988) are used as one set of lenses, called technology lenses, to better understand researchers' views regarding the causal structure between IT and organizational power. A second set of lenses, which includes the rational, pluralist, interpretive, and radical perspectives (Bradshaw-Camball and Murray 1991), is used to focus on researchers' views of the role of power and different IT outcomes. They applied each lens (concept) separately to describe patterns emerging from the previous power and IT studies. Bradshaw-Camball and Murray (1991) defined that each lens directs attention to some aspects of politics and away from others, i.e., both Bradshaw-Camball and Murray (1991) and Jasperson *et al* (2002) considered a single concept as a lens here called a *conceptual lens*. Because a conceptual lens has minor differentiation power than a set of concepts on one dimension, usually called classification, we prefer the latter and call it here a *dimensional lens*.

We shall in this section reconsider technology lenses and power lenses and we are interested in whether both dimensional lenses are "cleaned" and complete or are in a set of conceptual lenses some anomalies, discontinuities or inconsistencies. We first analyze the technology lenses (technological imperative, organizational imperative, and emergent perspectives) taken from Markus and Robey (1988) and thereafter power lenses taken from Bradshaw-Camball and Murray (1991).

Technology lenses

Our purpose in analysis of technology lenses is to identify our first guideline. Markus and Robey (1988) were interested in good theories about why and how information technology affects organizational life. Theories were often evaluated in terms of their content – the specific concepts used and the human values served. Markus and Robey (1988) examined theories in terms of their structures – theorists' assumptions about the nature and direction of causal influence. Three dimensions of causal structure were considered - causal agency, logical structure, and level of analysis. Jaspersen *et al* (2002) used causal agency only, and according to Markus and Robey it refers to beliefs about the nature of causality: whether external forces cause change (technological imperative), whether people act purposefully to accomplish intended objectives (organizational imperative) or whether changes emerge unpredictably from the interaction of people and events (emergent perspective). According to Figure 2 in Markus and Robey (1988, p. 586) the three types of causal agency (the technological imperative, the organizational imperative and the emergent perspective) have the same dependent variable, organizational structure.



"Figure 2. Causal Agency." (Markus and Robey 1988, p. 586)

According to Markus and Robey (p. 585) "causal agency refers to the analyst's beliefs about the identity of the causal agent, the nature of causal action and direction of causal influence among elements in a theory. Pfeffer (1982), for example, has identified "three perspectives on action in organizational theory. In the 'situational control' perspective, external factors or events constrain or force people and organizations to behave in certain ways. In the 'rational actor' perspective, people and organizations evaluate alternative courses of action and exercise free rational choice. In the 'emergent' perspective on action, the behavior of people and organizations emerges from a dynamic interaction of external circumstances and internal motives or interest."

Building upon the work of Pfeffer (1982), Markus and Robey (1988) have identified three conceptions of *causal agency* in the literature on information technology and organizational change. These were labeled: the technological imperative, the organizational imperative and the emergent perspective. In the technological imperative, information technology is viewed as a cause of organizational change. In the organizational imperative, the motives and actions of the designers of information technologies are a cause of organizational change. In the emergent perspective, organizational change emerges from an unpredictable interaction between information technology and its human and organizational users. Markus and Robey (1988, p. 588) also state that "the emergent perspective holds that the uses and consequences of information technology emerge unpredictably from complex social interactions".

In order to analyze whether the set of the technological imperative, organizational imperative and emergent perspectives is "cleaned" and complete or are in this set some anomalies, discontinuities or inconsistencies, we identify that the technological imperative and the organizational imperative have a clear cause of organizational change *but the emergent perspective does not have*. The type of causality (clear cause, unclear cause) is differentiating principle between two former and the latter, i.e., in causal agency there are two dimensions. The technological imperative and the organizational imperative make up the first dimension and the emergent perspective the second one. But what is differentiating principle between the technological imperative and the organizational imperative? According to Markus and Robey (1988) external forces (information technology) cause change (technological imperative), when people act purposefully to accomplish intended objectives they cause change (organizational imperative). Hence, we can conclude that *the differentiating principle between the technological imperative and the organizational imperative is the type of cause* (technology vs. people/social). The set of the technological imperative, organizational imperative and emergent perspectives (a candidate of classification) is not a linear list of three classes divided by one principle only but there are two differentiating principles (type of causality, the type of cause) in dividing this set into classes (Table 1). In other words, we can propose that *if a differentiating principle does not stay permanent during unpacking of a tentative dimension, divide a tentative dimension into two or more independent dimensions* (Guideline A).

Table 1. Causal Agency

		Type of cause	
		Technology	People/social
Type of causality	Clear (predictable)	Technological imperative	Organizational imperative
	Unclear (unpredictable)	Emergent perspective	

In Table 1 we have differentiated causal agency (the technological imperative, the organizational imperative and the emergent perspective) that seems to be one (tentative) dimension into two independent dimensions: type of causality and type of cause.

Power lenses

Our purpose in analysis of power lenses is to identify some guidelines more. Jasperson *et al* (2002, p. 402) argue their selection of power lenses (the rational, pluralist, interpretive, and radical perspectives) as follows: "The technology lenses lack the ability to address power in deeper societal structures. The narrowly constructed explanations of social order and change - rational or political - do not explain, much less predict, the conceptualization of power that was hinted at in several articles in our sample. Possibly even more problematic, the technology lenses force classification into bifurcated categories of objectivity versus subjectivity based upon some preexisting reality. This precludes an alternative view in which meaningful reality is created intersubjectively. Some authors introduced this alternative view that meaning and the world as we know it are created through language and symbols." To overcome these limitations, Jasperson *et al* (2002, p. 402) adapted the framework developed and used by Bradshaw-Camball and Murray (1991) to understand power and organizational politics. This framework is a modified version of Burrell and Morgan's (1979) framework of sociological paradigms.

In order to analyze whether the set of the rational, pluralist, interpretive, and radical perspectives is "cleaned" and complete or are in this set some anomalies, discontinuities or inconsistencies, we identify from above that the framework developed by Bradshaw-Camball and Murray (1991) is a modified version of Burrell and Morgan's (1979) framework of sociological paradigms. The original Burrell and Morgan's (1979) framework of sociological paradigms consists of four quadrants, called paradigms. The four paradigms by Burrell and Morgan (Table 2) are the four combinations of the opposite ends of two dimensions. The first dimension is about the nature of social sciences which divides it into two approaches, subjectivist and objectivist. The second dimension is borrowed from the macro level of society. The theories are allocated within the dichotomy between the sociology of regulation and the sociology of radical change. The combinations of these two dimensions lead to four paradigms (Table 2).

Table 2. The Burrell and Morgan's (1979) framework

	<i>Subjectivist</i>	<i>Objectivist</i>
<i>Radical change</i>	Radical humanist	Radical structuralist
<i>Regulation</i>	Interpretive	Functionalist

Bradshaw-Camball and Murray (1991) motivate readers by saying that despite recent and growing interest in organizational politics, conceptual thought in this area tends to be dominated by a single theoretical perspective. In their paper Bradshaw-Camball and Murray (1991, , pp. 380 - 381) describe and contrast three views of organizational politics (functionalist, interpretive and radical) according to their differing structures, processes and outcomes. They describe the three perspectives (functionalist, interpretive and radical) as follows: "Located within the structural-functionalist paradigm (Burrell and Morgan 1979), the functionalist perspective assumes that power is an objective reality. The functionalist perspective contains two main schools of thought. The first is the *pluralist* sub-school which focuses on overt stakeholder behaviours such as coalition formation and bargaining. The second sub-school, the *rationalist* view, focuses on the legitimate authority of top management and the intended rationality of its decision making activities. While admitting that perfect technical/economic rationality is usually not possible, it assumes that top management decision-making will be at least intended to optimally achieve organization-wide objectives within given constraints."

According to Bradshaw-Camball and Murray (1991, p. 382) with its roots in Burrell and Morgan's (1979) "interpretive paradigm which assumes that reality is socially constructed, the *interpretive* perspective in organizational politics suggests that the parties involved exert influence by constructing the meaning of what others experience. Power increases to the extent that the powerless, implicitly or explicitly, surrender to the powerful the ability to define the nature of their experience, for example, by controlling others' thought processes the powerful can achieve their ends without the powerless even being aware." The third main view of workplace politics can be called the *radical* perspective, located within Burrell and Morgan's (1979) radical structuralist paradigm. According to Bradshaw-Camball and Murray (1991, p. 382) proponents of this approach argue that "people create their social world within the context of, and under the constraints of, practices previously constructed by those who control resources or possess legitimate authority". By using the same dimensions as Burrell and Morgan in Table 2 above the framework developed by Bradshaw-Camball and Murray (1991) is in Table 3.

Table 3. The Bradshaw-Camball and Murray's (1991) framework

	<i>Subjectivist</i>	<i>Objectivist</i>
<i>Radical change</i>		Radical
<i>Regulation</i>	Interpretive	Rational and Pluralist

By comparing Tables 2 and 3 we can first conclude that Bradshaw-Camball and Murray (1991) forgot the Burrell and Morgan's radical humanist class at all. They at the same moment excluded one class (radical humanist) from the Burrell and Morgan's (1979) framework originally containing four classes, and the differentiating power of the framework then diminished. Hence the Bradshaw-Camball and Murray's (1991) framework is not exhaustive. In the Burrell and Morgan's framework there are two dimensions (subjectivist and objectivist; regulation and radical change) that can be kept as dimensions with two classes, respectively. The Burrell and Morgan's framework has four classes but in the Bradshaw-Camball and Murray's (1991) framework only three classes. Hence we can derive Guideline B: *If a set of classes is not exhaustive, you can add a new class into a classification.* - The basic assumptions of the four paradigms (functionalist, interpretive, radical structuralist and radical humanist) are differing because of differentiation

between objectivist and subjectivist and regulation and radical change. This leads to Guideline C: *Change underlying assumptions whenever it is interesting and promising.*

Secondly, Bradshaw-Camball and Murray (1991) in Table 3 divided the functionalist class into two classes (rational and pluralist sub-schools). This kind of division often takes place in research when we want to achieve even deeper knowledge about something. We can derive a general opportunity *to divide a particular class in the classification into subclasses* (Guideline D).

Jasperson *et al* (2002, p. 407) in the following way defined two sub-schools based on views in Bradshaw-Camball and Murray (1991):

The *rationalist* sub-school - Structural power that focuses on authority, information, and expertise as bases of power; emphasizes rational decision making. Power is viewed in terms of an objective reality in which there is an objectively identifiable, ordered set of optimal goals for the organization.

The *pluralist* sub-school - Power that assumes objective definitions of power and that conflict is the norm; development, prioritization, and execution of organizational goals is an explicitly political process involving conscious negotiation based on control of resources and information. Power viewed in terms of an objective reality in which there are objectively identifiable sets of optimal goals for each participant in an organization.

We have here emphasized that the differentiation power of classification is stronger than a single concept. In this sense we shall consider how Jasperson *et al* (2002) succeeded in their analysis of articles. They (pp. 408-409) described the articles in their review separately. In the organizational imperative they considered that the dominant power perspective of Huber's (1981) non-empirical study and Tractinsky and Jarvenpaa's (1995) survey is rational and its secondary power perspective is pluralist, and the dominant power perspective of Franz and Robey's (1984) case study pluralist and its secondary power perspective is rational. In addition, in the emergent perspective, the dominant power perspective of Kling and Iacono's (1984) longitudinal case study is interpretive and both rational and pluralist are its secondary power perspectives. The reason for two domains at the same time can be overlapping domains of the rational and pluralist sub-schools, i.e., they can contain some elements that belong to both classes (rational, pluralist) and then some variables are not independent. We can derive Guideline D: *If the classes in the classification are not pairwise disjoint, you can achieve such classes by dividing a certain class into subclasses. The dividing process can be repeated as many times as needed.*

Next our purpose in analysis of power lenses is to still identify a new opportunity. From a literature Jasperson *et al* (2002) collected more than 20 different themes in power conceptualizations. At least one theme is, however, still lacking, namely a self-organizing team. This phrase is taken from Nonaka (1994). He proposes a paradigm for managing the dynamic aspects of organizational knowledge creating processes. Its central idea is that organizational knowledge is created through a continuous dialogue between tacit and explicit knowledge. He examined the nature of this dialogue and identified four patterns of interaction involving tacit and explicit knowledge. He argues that while new knowledge is developed by individuals, organizations play a critical role in articulating and amplifying that knowledge. He develops a theoretical framework which provides an analytical perspective on the constituent dimensions of knowledge creation. This framework is then applied in two operational models for facilitating the dynamic creation of appropriate organizational knowledge. One of the operational models is a self-organizing team. - The Nonaka's article has been published in *Organization Science*, one of the

journals Jasperson *et al* accept into their sample. The Nonaka's article contains no reference into IT and it mainly considers information that, for example, Lee *et al* (2015) keep as a part of IT. An exchange of information in self-organizing teams plays a central role in the Nonaka's theory of organizational knowledge development. Although there are some argumentation for inclusion of the Nonaka's article, we well understand that Jasperson *et al* (2002) exclude the Nonaka's article from their sample, because IT is not explicitly presented in this article. - The self-organizing team differs from organizational bodies in power conceptualizations found by Jasperson *et al* (2002). In the latter all the bodies seem to be externally organized by some manager, controlling group, party, collective or structure having power. Because of a new type to organize we could have a new dimension with at least two classes, self-organizing vs. externally organized. Hence we sometimes have an opportunity to apply Guideline E: *You can add a new dimension whenever needed.*

Analysis of some other lens-directed literature reviews

In this section our purpose is to demonstrate how our five guidelines can be applied to the lenses used in the literature. We shall in this sense analyze the following two papers: Elgarah *et al.* (2005) and Besson and Rowe (2012). The former shows how often researchers have deficiencies in their classifications. The latter shows how an exceptional known class (not any new class) in Besson and Rowe (2012) can need an extra study, i.e., an exceptionally small number in this class (economic) can be interpreted as a gap.

Elgarah *et al.* (2005)

Elgarah *et al.* (2005 p.10) state their research task as follows: "To explore the theoretical underpinnings of data exchange research, we chose four paradigmatic lenses that have been frequently used in the literature to understand the relationships between trading partners. These lenses were causal agency (Markus & Robey, 1988), transactions cost economics (Williamson, 1991), IOR motives (Oliver, 1990), and IOR typology (Hall, 1999). Analyzing studies using different paradigmatic lenses allowed us to identify conceptual and/or methodological gaps that have been overlooked by researchers and that have strong potential for future research."

We already tentatively analyzed *causal agency* (Markus and Robey 1988) and found that there are two dimensions with classes (1) technological imperative and organizational imperative and (2) emergent perspective. Behind of two classes there are technology and people/social (Table 1). If we interpret those as resources we can apply Guideline B (If a set of classes is not exhaustive, you can add a new class into a classification) and ask which resource type is lacking. Ciborra (1978) proposes one alternative: " The traditional role of computer-based information systems is to provide support for individual decision making. According to this model, information is to be seen as a valuable resource for the decision maker with a complex task." Levitin and Redman (1998) support that data, information and knowledge are an important resource type.

The second set of lenses Elgarah *et al.* (2005) used was *transactions cost economics* (Williamson, 1991). Williamson described three forms of organizational governance: hierarchy, hybrid, and market. According to Williamson (1991, p. 280) markets and hierarchies are polar modes. A major purpose of his paper is to locate hybrid modes—various forms of long-term contracting, reciprocal trading, regulation, franchising, and the like—in relation to these polar modes. Elgarah *et al.* used

these three forms and differentiated them with the following attributes: administrative controls, the adaptation and use of contract law. Williamson (1991, p. 281) described three governance structures in Table 4.

Table 4. Distinguishing Attributes of Market,, Hybrid, and Hierarchy Governance Structures*

Attributes	Governance Structure		
	Market	Hybrid	Hierarchy
Instruments			
Incentive intensity	++	+	0
Administrative controls	0	+	++
Performance attributes			
Adaptation (A)	++	+	0
Adaptation (C)	0	+	++
Contract law	++	+	0

* ++ = strong; + = semi-strong; 0 = weak

According to (Williamson 1991, p. 283) "the hybrid mode is located between market and hierarchy with respect to incentives, adaptability, and bureaucratic costs. As compared with the market, the hybrid sacrifices incentives in favor of superior coordination among the parts. As compared with the hierarchy, the hybrid sacrifices cooperativeness in favor of greater incentive intensity. The distribution of branded product from retail outlets by market, hierarchy, and hybrid, where franchising is an example of this last, illustrates the argument." Therefore it is problematic that Elgarah *et al.* did not use attribute "incentive intensity" at all and did not differentiate adaptation into two forms (A and C that are opposite). To our mind a differentiating principle does not stay permanent (Guideline 1). In addition already Williamson (1991) defined the boundaries of three structures (market, hybrid and hierarchy) weakly and hence the classes might not be pairwise disjoint (Guideline 4).

Ciborra (1987) studied comparative economic organization and referred to Williamson (1975) and his another variant of transactions cost economics. Williamson then differentiated market, hierarchy and clan as follows: "Depending upon the degrees of ambiguity in the service or product object of exchange and the goal congruence among parties, the three arrangements, the market, the hierarchical firm and the clan or group, are the most efficient organizational mechanisms for solving the fundamental problem of organizing" (Table 5) (Ciborra 1987, p. 260)

Table 5. Three organizational forms

		Product/service uncertainty		
		Low		High
Goal congruence	Low	Market		
			Hierarchy	
	High			Clan

The differentiating attributes (product/service uncertainty and goal congruence) are not more accurate than in Table 4 and hence the classes might not be pairwise disjoint (Guideline 4). Tables 4 and 5 show that in transactions cost economics there are at least two variants, maybe more, and researchers could compare them and select the best one to act as a lens for their study.

To examine the motives for adopting data exchange, Elgarah *et al.* (2005) chose to derive the third set of lenses from Oliver's (Oliver, 1990) *motives for interorganizational relationships* (IOR). Oliver presented six possible motives for organizations to engage in interorganizational relationships: necessity, asymmetry, reciprocity, efficiency, stability, and legitimacy (Table 6).

Table 6. IOR motives definitions – source: Oliver, 1990 (Elgarah *et al.* 2005 p.12)

Necessity	IORs are established to meet legal or regulatory requirements.
Asymmetry	IORs are established in response to power or control of another organization.
Reciprocity	IORs are based on cooperation, collaboration and coordination among organizations
Efficiency	IORs are prompted to improve the internal input/output ratio of an organization and internal efficiency.
Stability	IORs formation is an adaptive response to environmental uncertainty (generated by resource scarcity or lack of perfect knowledge).
Legitimacy	IORs are established to appear in agreement with the prevailing norms, rules or expectations of external constituents and/or to improve the image, reputation, prestige.

Concerning the set of the six lenses of IOR we shall carefully consider how Elgarah *et al.* (2005) used their reference from Oliver (1990). We shall show some weaknesses in their use of the reference in general and especially related to legitimacy and efficiency. Oliver writes that "based on an integration of IOR literature from 1960 to present [1990], six critical contingencies of relationship formation are proposed as generalizable determinants of IORs across organizations, settings, and linkages: necessity, asymmetry, reciprocity, efficiency, stability, and legitimacy. Oliver does not speak about motives but determinants. In connection with asymmetry and legitimacy she uses term 'motive' only once but in connection with other determinants not at all.

The definitions in Table 6 are problematic, because they do not always correspond to Oliver's descriptions. For example, concerning legitimacy Oliver (1990, p. 246) writes that "... institutional environments impose pressures on organizations to justify their activities or outputs. These pressures motivate organizations increase their legitimacy ...". The expression cited much differs from the description in Table 6. In addition the definition of efficiency in Table 6 contains a circular form (efficiency is efficiency). Oliver (1990, p. 254) among other things writes that "some

incentives for establishing IORs for the purposes of improving efficiency may be the organization's anticipation of increases in return on assets or reductions in unit costs, waste, downtime, or cost per patient or client." To our mind, the last citation might give a better basis for definition of the efficiency motive. The examples above demonstrate that Guideline 4 was violated.

Oliver (1990) does not guarantee for exhaustiveness of her six determinants or motives (Guideline 2) and a reader cannot check it because Oliver does not describe the process how she forms the set of the six determinants.

Concerning the second set of lenses (transactions cost economics) Oliver (1990, p. 245) writes that "Williamson's (1975, 1985) transaction cost perspective is consistent with the argument that efficiency is an underlying determinant of IORs". To our mind, the two sets of lenses (transactions cost economics, IOR motives) are interrelated, but we prefer independent set of lenses, independent classifications.

The last set of lenses that Elgarah *et al.* (2005) adopt in their analysis is the *IOR typology* presented by Hall (1999). They chose this paradigm lens to identify the types of IORs most studied in data exchange research. Hall (1999) identified three types of IORs: dyadic (pairwise) relationships, interorganizational sets, and interorganizational networks. A *dyad* displays a relationship between just two organizations; a *set* places emphasis on a focal agency and all of its dyadic relationships with other organizations; and, a *network* consist of multiple organizations linked by a specified type of relation to achieve certain goals or resolve specific problems. Concerning Guidelines A ... E we do not find anything to remark for the set of lenses for IOR typology.

Besson and Rowe (2012)

Besson and Rowe (2012) review "the Organizational Transformation (IS-enabled OT) literature in order to better understand this phenomenon. As specialists in IS, strategy and organizational studies, we analyze the discourse on OT found in the strategy, organizational theory and IS literature, and identify four structuring themes: organizational inertia, process, agency and performance. For these four themes the authors derive a conceptual framework with necessary coding schemes and then apply the coding to a set of 62 empirical papers." The second author later Rowe (2014) explains that a conceptual framework can be developed to read through the empirical literature. Their conceptual framework contains four lenses, one for each theme.

We take lenses from the Besson and Rowe's (2012) Appendix B and present them as follows:

Organizational inertia N – Not relevant, NP – Negative Psychology, SC – Socio-cognitive, ST – Socio-technical, E – Economic, P – Political, I – Inertia

Process N – Not relevant, U – Uprooting phase, C – Exploration/ construction Phase, R – Routinization phase, T – Time

Agency N – Not relevant, GA – Governing agency, C – Centralized, D – Decentralized, H – Hybrid WA – Working agency, P – Planned, E – Emergent, H – Hybrid

Performance N – Not relevant, P - Project, MV – Market value, CA – Competitive advantage, RF– Risk of failure

The four lenses much help Besson and Rowe (2012). The four lenses are slightly against our five guidelines. The authors do not use their four lenses in conclusions but they paid attention to dimension inertia and wanted that researchers "must pay more attention to all dimensions of inertia, particularly economic ones, in their analyses of transformation". Hence they recommended more work with the economic inertia and at the same time avoided some problems their other lenses.

Rowe (2016) informs that Besson and Rowe strongly criticize the literature for not paying more attention to the transformation process. They then cite that "concerning IS enabled organizational transformation, Robey and Sahay (1996) argued in 1996 that empirical research has not distinguished these theories according to their interpretation capacity. Based on the results of our literature review, we contend that this is still true in 2012." (Besson and Rowe 2012, p. 105)

On applicability of our five guidelines

In this section we shall discuss applicability of our five guidelines, and we shall also relate them with Sandberg and Alvesson's (2011) modes of gap-spotting and with their four ways to go beyond. We consider our guidelines at two different moment in the literature review process: ex ante - before performing putting studies into classes, and ex post - after a tentative model or framework is built up concerning the topic under review.

In order to refresh our memory we collect our guidelines:

Guideline A: If a differentiating principle does not stay permanent during unpacking of a tentative dimension, divide a tentative dimension into two or more independent dimensions.

Guideline B: If a set of classes is not exhaustive, you can add a new class into a classification.

Guideline C: Change underlying assumptions whenever it is interesting and promising.

Guideline D: If the classes in the classification are not pairwise disjoint, you can achieve such classes by dividing a certain class into subclasses. The dividing process can be repeated as many times as needed.

Guideline E: You can add a new dimension whenever needed.

On applicability ex ante

We assume that researchers have selected a certain theoretical framework before they start to put searched and assessed primary studies into classes. We also assume that the framework is unpacked into candidate classifications by using Guideline D. They can be analyzed in the similar way as we did with Jaspersen *et al* (2002) by using our five guidelines. The analysis can result as a set of complemented classifications where also some new classes are waiting for primary studies. A particular primary study can then be put into the correct class.

According to Sandberg and Alvesson (2011) the application spotting mainly searches for a shortage of a particular theory in a specific area of research. Researchers can take a particular theory for consideration. This theory can be unpacked into candidate classifications. Again the candidate classifications can be analyzed in the similar way as we have done by using our five guidelines. The analysis can result as a complemented theory where also some new classes and relations can

emerge. In addition to application of our five guidelines we can find ideas from our everyday experiences and the studies read to add a new dimension into the theory under consideration.

On applicability *ex post*

We assume here that researchers performed a literature review process. Its synthesis phase may not according to Rowe (2014) integrate all the knowledge elements provided by the literature into an overall logic but a set of coherent macro-concepts. Schryen (2015) complements Rowe by saying that the literature has suggested various interpretations and instantiations of concept, including theories, models, and theoretical frameworks. If the literature review shows either a confusion or neglect spotting, we do not have a need for application of our five guidelines and we then have a good reason to construct our research question. But if this is not a case, we can analyze a tentative model of the phenomenon under study in the similar way as we have done with Jasperson *et al* (2002) by using our five guidelines. An improved model can be as a results of our analysis but we do not know whether the earlier studies we have found will be classified in the same way as in constructing the tentative model or should we re-classify them using our improved model. The latter causes a little extra work but in any case we have the improved model that can be used as a starting point to construct a research question.

Proportioning our five guidelines to the Sandberg and Alvesson's (2011) four ways to go beyond

The four ways consists of critical confrontation, new idea, quasi-problematization and problematization. Sandberg and Alvesson's (2011) have stated that the critical confrontation may take the form of application spotting. In connection with applicability *ex ante* we proved that our five guidelines can support critical confrontation. Our opportunities, such as adding a new dimension and class and dividing a particular class into subclasses, support a new idea; changing underlying assumptions (Guideline C), supports quasi-problematization and problematization.

Discussion

A literature review is normally based on a set of concepts used in primary studies (Webster and Watson 2002). Our findings first time concretize Sandberg and Alvesson's (2011) four ways of constructing research questions that go beyond gap-spotting and bring new aspects into consideration.

In earlier literature reviews concepts are used as lenses. But a certain concept can only divide a world into two parts. We are the first ones who enlarge a lens to a classification that much increases possibilities to differentiate a world.

We have developed Guidelines A, B and D that are similar as the three rules Bunge (1967) found but our merit is that we first time used them for improving classifications as lenses in connection with literature review. Our five guidelines play a central role in finding opportunities to improve a literature review process. We have demonstrated that this improvement can take place either *ex ante* or *ex post*.

We used Jasperson *et al* (2002) as a context of our analysis. At the same moment we could show that Jasperson *et al* (2002) might lose some potential opportunities to develop more or promising

metaconjectures when they used single concepts of Markus and Robey (1988) and Bradshaw-Camball and Murray's (1991) as lenses. Our lenses might offer a better alternative. As a side results we showed that the frameworks used in Markus and Robey (1988) and Bradshaw-Camball and Murray's (1991) are not the best possible ones.

In this paper we only used classifications with concepts and relations, the most common perspective (variance perspective) used in Information Systems studies (Burton-Jones *et al* 2015). We therefore excluded the process and systems perspectives that is limitation of this paper but they can be re-considered in further studies.

Acknowledgement

We thank you, prof. Frantz Rowe, for your all kinds of comments and proposals during the long period in the preparation process of this paper. We know that you have used days for this work. We earlier wrote in a negative sense (Järvinen 2008) about lenses but you showed how the lenses can be used in supporting literature review and in a positive sense. We are proud how productive the text above is because of your support.

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