Research Methods
Information, Systems and Contexts

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This chapter begins with a broad overview of the methodological landscape that distinguishes between three levels: the level of meta-theoretical assumptions where different paradigms are articulated, the level of research methods and the level of research techniques and tools. Different research paradigms are then discussed, making explicit the assumptions that inform them, and the relationships between methodology, theory and method in conducting research. We then build on this analysis illustrating the distinctive nature of the paradigms with examples from three seminal papers from within the same topic domain, information richness. Drawing on these papers, we discuss how the methodological assumptions determine choice of research paradigm, formulation of research questions and selection of methods, and provide practical examples of how this is achieved. The chapter concludes by summarising the arguments for adopting a broader view of research methodology and its importance for achieving greater reflexive awareness of our ‘unconscious metaphysics’ that underlay and influence how we see and research the world.
Introduction

The purpose of this chapter is to present a broad view of the methodological landscape within which researchers in information systems and knowledge management find pathways in their pursuits of knowledge and scholarship. By discussing methodological issues within such a broad landscape that not only includes research methods and techniques, but also what lies behind them, the chapter promotes thinking about, and a reflective attitude towards, meta-theoretical assumptions. Drawing researchers’ attention to the meta-theoretical assumptions raises awareness of research paradigms and the way they affect methodological choices in information systems and knowledge management (and beyond). There are at least two reasons why this is important for information systems and knowledge management in particular. First, research publications even in their top outlets often avoid dealing with the assumptions and the way they underpin and limit particular research designs and methods. Second, research methods courses are primarily concerned with methods and techniques, that is, how to conduct research, without discussing why we choose to conduct research in a particular way.

Through research we build knowledge and understanding of phenomena involved in developing, deploying and using information systems and knowledge management systems in organisations and society. As information and knowledge-related fields, information systems and knowledge management investigate a wide range of research problems in order to advance understanding of the adoption of information technologies (IT), the nature of technologically-mediated information and knowledge management, and the ways they enable and limit different forms of organising, governing and community living. This chapter deals specifically with the question of methodology, i.e., the ways in which our assumptions about these processes influence how we research them; how we link research problems and questions with particular research methods and techniques to conduct empirical research; and how we create new understanding and knowledge claims.

In this chapter we consider information systems and knowledge management as overlapping fields broadly concerned with the adoption and appropriation of IT to develop and deploy IT-based systems (information systems, knowledge-based and knowledge management systems) that automate routine tasks and support individuals, groups and organisations in planning, conducting, and coordinating non-routine, creative and complex tasks and activities.\textsuperscript{11} Research in information

\textsuperscript{11} Knowledge management is defined more generally as “a range of strategies and practices used in an organization to identify, create, represent, distribute, and enable adoption of insights and experiences. Such insights and experiences comprise knowledge, either embodied in individuals or embedded in organizations as processes or practices” (Knowledge management, 2012). Apart from information systems, knowledge management has been studied within the fields of business administration and management, library and information sciences, computer science, media studies, and public policy and others (Alavi & Leidner, 1999).
systems for instance covers a wide range of topics including information systems development and implementation, information systems management and strategy, information systems/IT infrastructure, value creation through information systems, social and organisational aspects of information systems/IT, global aspects of IT, and many more. Several works discuss the topics of concern or fields of research in information systems in greater depth (Lee, 2010; Orlikowski & Baroudi, 1991; Willcocks & Lee, 2007). Knowledge management research is more explicitly concerned with the nature of knowledge in organisations and how information systems and knowledge-based systems support and enable knowledge creation, discovery, sharing and transfer (Alavi & Leidner, 1999; Burstein & Linger, 2006; Newell & Galliers, 2006; Schultze & Leidner, 2002); furthermore, to examine these issues researchers also investigate organisational learning, social capital, and communities of practice, among others (Timbrell, Delaney, Chan, Yue, & Gable, 2005).

Research methodology is not necessarily a well understood concept and researchers in information systems and knowledge management often struggle in comprehending its meaning and especially its distinction from another important concept – research method (Mingers, 2003). We make here a clear distinction between the concept of methodology as an overall logic of inquiry – including a set of assumptions or a paradigm as a foundation for (the selection of) research methods and techniques and the way they are used to make knowledge claims – and research method as a much narrower concept that defines processes, procedures and techniques to conduct empirical studies and collect and analyse data (Cecez-Kecmanovic, 2011). Scholarly articles in information systems and knowledge management are increasingly more focussed on methods and technical issues of data collection and analysis while disregarding broader methodological issues. Reviewers and editors pay particular attention to the elaborate detailing of research methods and techniques with a tacit assumption that the adoption of ‘rigorous’ and ‘reliable’ research methods is a guarantor of the validity of research outcomes. The quality and validity of research outcomes are often reduced to, and thus judged by, the rigour and reliability of research methods and techniques. This is reinforced by research training that is often focussed on the technical matters, especially in relation to quantitative data analysis and statistical techniques. Assumptions and theoretical foundations that inform research questions and the overall design of the study, and the arguments for selecting particular research method(s) are often ignored.

In this chapter we aim to redress this imbalance and argue for and demonstrate the importance of research methodology – above and beyond the rigorous application of research methods and techniques – in developing and conducting research projects and producing high quality research results. In order to achieve this we draw from philosophy of science and sociology literature to analyse key aspects of methodology and its meaning and relevance in empirical research. We also discuss how a researcher’s view of the world and the meta-theoretical foundation influence the type of questions the researcher will ask and also open (as well as limit) potential methodological paths that he or she will choose from.
Furthermore, we discuss how research questions are developed and how methodological arguments are used to select and justify the research methods to answer the questions. We give examples from information systems and knowledge management research; however, the issues covered are also relevant for other fields of research.

This chapter is intended to be relevant and useful for both novice and more experienced researchers. Novice researchers will be introduced to an advanced level of thinking about the assumptions that inform research and the relationship between methodology, theory, and method in the conduct of research. For experienced researchers, the chapter provides arguments and examples that might stimulate critical reflection on their research practices, their dealing with methodological issues and choices of, and justification for, particular research methods.

**Methodological landscape**

Methodology denotes an overall logic of inquiry involving philosophical assumptions behind an inquiry, the strategy of conducting research such as research design and selection and adoption of research methods and techniques as well as arguments for knowledge construction and justification (Cecez-Kecmanovic, 2001; Cecez-Kecmanovic, 2011; Morrow & Brown, 1994). On the one hand, philosophical assumptions, or meta-theories, underpin and inform the overall strategy, research design and selection of research methods. Methods and techniques, on the other hand, denote specific processes and procedures for conducting empirical research and collecting and processing data. By understanding methodological questions researchers become more critical about the use and adoption of research methods in their research practice. An understanding of methodology focuses the researcher’s attention on meta-theoretical questions, especially those concerned with ontology, epistemology, logic, and ethics (Mingers & Walsham, 2010; Morrow & Brown, 1994; Ritzer, 1992). Concerns with the ontological, epistemological, axiological, and normative assumptions underpinning an inquiry enable researchers to move beyond a narrow focus on research methods and to adopt a critical and reflective attitude towards method selection and application. These in turn lead to a greater awareness and understanding of the strengths and limitations of all methods.

A meta-theory is not aiming to explain any specific natural, social or technological phenomena as such but is concerned with attempts to make sense of different theories that claim to explain these phenomena. In other words, meta-theory is concerned with theories and theorising in a particular disciplinary domain. Meta-theorising examines assumptions behind existing theories in order to achieve a more profound understanding of these theories or different theoretical perspectives (Cecez-Kecmanovic, 2011; Ritzer, 1992).

The brief meta-theoretical discussion in this chapter is designed to draw attention to philosophical assumptions underlying various research paradigms in information systems and knowledge management, and the way they
(assumptions) remain implied but often not explicitly recognised in the adoption, and application of, research methods and techniques. Such a meta-theoretical examination is necessary for understanding the relations between a paradigm, affiliated research methods and techniques, and researchers’ choices in establishing particular relations. This understanding will help researchers appreciate and reflect on implicit limitations and implications of these choices.

To assist in understanding the methodological landscape, a simplified three-layer presentation of the landscape is depicted in Figure 5.1. At the top is a layer of meta-theoretical assumptions where the different research paradigms can be distinguished and defined. It is of note that in Figure 5.1 we present three widely known paradigms in information systems and knowledge management – the positivist, interpretive, and critical – while indicating that there are others less well-known or emerging paradigms (postmodern, feminist, and sociomaterial).

**Figure 5.1** The information systems methodological landscape

![The information systems methodological landscape](image)

*Source: Adapted from Cecez-Kecmanovic 2011.*

Research methods (survey, experiments, case study, ethnography and many more) are represented in the middle layer. Research methods can be quantitative or qualitative in nature. Research methods are not directly linked to research paradigms but are more or less affiliated with them. While non-deterministic, these affiliations among paradigms and research methods do exist (Crotty, 1998) predominantly due to shared assumptions (to be discussed in the next section). The techniques and tools of data collection and analysis (questionnaire, statistical analysis, interview, thematic analysis and coding, discourse analysis, and others) are presented at the bottom layer suggesting that a method can be applied by choosing one or more of available techniques. For instance, researchers adopting a
case study may use a questionnaire, focus groups, interviews and participant observation as data collection techniques and thematic analysis and coding as data analysis techniques (Ezzy, 2002). Grounded theory is an exception as it can be applied as both a method and a data analysis technique.

The term research paradigm denotes a broad framework or perspective of a group of theorists who share ontological and epistemological assumptions, adopt a similar logic of scientific explanations and share a common attitude towards ethics and place of values in research. The paradigm “is the broadest unit of consensus within a science and serves to differentiate one scientific community (or sub-community) from another” (Ritzer, 1980, p. 7). By assuming a particular world view about the nature of the subject matter in their field and how a study should be conducted, researchers adopt a specific paradigm. A paradigm provides a foundation to frame a study and make sense of and acquire knowledge about the subject matter. Research paradigms are generally based on meta-theoretical assumptions in relation to four key aspects:

- **ontology** – the nature and existence of social reality
- **epistemology** – the nature of knowledge and the ways of knowing
- **the logic of scientific explanation**
- **ethics** and claims about **values** and normative reasoning concerned with what ‘ought’ to be.

These four sets of assumptions are of central importance for defining research paradigms and understanding research methodologies.

The importance of assumptions in guiding research and determining how reality is seen and studied, what acceptable modes of inquiry are, and what forms of theorising and types of knowledge claims are legitimate, cannot be overstated (Burrell & Morgan, 1979; Neuman, 2011). And yet the assumptions behind paradigms are often taken for granted and rarely questioned or debated within more established paradigm communities. Numerous research studies in information systems and knowledge management, as well as in some other social sciences, do not address, state or problematise assumptions underlying their research and knowledge claims. Such attitudes have detrimental implications for scholarship (Constantinides, Chiasson, & Introna, 2012) and limit our ability to conduct innovative and interesting research (Alvesson & Sandberg, 2011).

In their influential book *Sociological Paradigms and Organisational Analysis*, Burrell and Morgan (1979) brought this issue to the fore and provided a broad framework to examine and debate the meta-theoretical and methodological questions. They argued for a typology of research paradigms in social sciences based on two orthogonal dimensions: ‘subjectivist vs objectivist’ and ‘order vs radical change’ and respective sets of assumptions. The four combinations of these sets of assumptions defined four distinct research paradigms: **functionalism** (positivism), **interpretivism**, **radical humanism** (critical theory) and **radical structuralism**. Burrell and Morgan argued that, consciously or unconsciously, researchers base their
work on a series of assumptions that place research in a particular quadrant of their framework.

Orlikowski and Baroudi (1991) argued that the use of these different paradigms, with their different assumptions and methodologies, enables the exploration of phenomena from diverse frames of reference and therefore should be encouraged to provide a richer understanding of the issues under study. The continuing separate use of these different paradigms rests on the acceptance of the notion of ‘paradigm incommensurability’. Paradigm incommensurability is one of the pillars of Burrell and Morgan’s (1979) work and refers to the contention that the paradigms are mutually exclusive. Further, it is considered that research methodologies and methods are bound to particular paradigms and are therefore also incommensurate. Some researchers have argued for paradigm integration, but reflect on the drawback that, although the paradigms may blur at the edges, they are based on competing and irreconcilable assumptions. Others have suggested paradigm interplay, which acknowledges differences and similarities by encouraging cross-fertilisation between paradigms (Goles & Hirschheim, 2000, pp. 259-260). Still others consider paradigm incommensurability to be overstated and have argued for a pluralist approach. The pluralist approach suggests that researchers do not have to accept existing paradigms but can develop new ones by drawing on the strengths and weaknesses of the old ones, but have their own assumptions and concerns (Mingers, 2001).

Since the publication of Burrell and Morgan’s book, there have been several interesting and worthy attempts to critique and revise paradigm classification and advance debates on dominant versus emerging paradigms. In particular Deetz (1996) argued that the whole nature of the discourse on paradigms in research is too rigid and too strongly grounded in the objective/subjective dichotomy. Instead he proposed that we should be concerned with different discourses rather than paradigms, with equally important implications for research methodology. Contrary to the paradigm incommensurability thesis, movement across different discourses is seen as desirable and practically achievable. Other authors extended Burrell and Morgan’s framework and provided further arguments for the necessity to distinguish and advance understanding of different paradigms, their assumptions and their importance for methodological decisions (Goles & Hirschheim, 2000; Guba & Lincoln, 1994; Neuman, 2011; Orlikowski & Baroudi, 1991). These authors all agree that there are clear distinctions among positivist, interpretive and critical paradigms based on assumptions about ontology, epistemology, logic of scientific inquiry, and human values and ethics. These assumptions have important methodological implications for research design, selection of methods and techniques, and justification of knowledge claims.

In the next section we focus on positivist, interpretivist, and critical paradigms, as they have been widely accepted as distinct paradigms in the information and

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12 In addition Neuman (2011) for instance discusses postmodernist and feminist paradigms.
knowledge management fields (Chen & Hirschheim, 2004; Klein & Myers, 1999; Myers & Klein, 2011; Orlikowski & Baroudi, 1991; Schultze & Leidner, 2002). Note here an intentional plural form (paradigms) that suggests that these paradigms are not monolithic and that each covers a number of somewhat different but related strands (e.g., positivism related to post-positivism; interpretivism related to social constructivism and ethno-methodology). Other emerging paradigms that require attention include the postmodernist and feminist (Neuman, 2011) and sociomaterial paradigms (Barad, 2007; Orlikowski, 2010). Due to space constraints, they are not discussed in this chapter, but are mentioned to remind the reader that the three paradigms covered here do not present an exhaustive list. Furthermore, we caution the reader that the boundaries among research paradigms are not always clear-cut and the assumptions behind individual paradigms are not always mutually exclusive. For instance, critical social research is emerging in different (sometimes disputed) directions, including post-structuralist, postmodernist, critical feminist and critical realist strands, thus overlapping with other paradigms.

The three major research paradigms

The research approach adopted by researchers underlies the purpose of research, relevant literature and research questions, and affects the research design, selection of methods and what are considered valid research results and contribution to knowledge (Prescott & Conger, 1995; Neuman, 2011). As a result, it is important to note that the assessment of research outcomes and contributions of particular research will be judged differently (according to different criteria) by researchers following different paradigms. The adoption of a research paradigm will depend on the combination of personal knowledge, experience and interests, research training and/or a dominant approach in an affiliated department/school, and the disciplinary culture and tradition as exemplified by highly valued journals or publishing outlets. Despite that the majority of journals proclaim that no preference is given to any research paradigm or type of research, positivist or functionalist research is still dominant in information systems and knowledge management (Goles & Hirschheim, 2000; Orlikowski & Baroudi, 1991; Schultze & Leidner, 2002).

Positivist research is sometimes called traditional or scientific research in that it follows the ideal of the unity of science and is based on the belief that social science research should be conducted according to the same sets of principles and logic as research in the natural sciences (Lee, 1999). Positivist research is based on objectivist or realist ontology – the assumptions that social reality exists out there irrespective of the observer. It is also assumed that social reality is patterned, orderly and stable thus enabling scientists to discover existing regularities and formulate nomothetic explanations or causal laws, underpinned by epistemological realism, which holds that our observations, concepts and theories represent an objectively existing reality (Orlikowski & Baroudi, 1991; Neuman, 2011). The dominant logic of inquiry is hypothetic-deductive that starts with the literature examination of a specific problem in order to assess previous research,
identify inconsistencies and tensions, and thereby formulate gaps in the literature. By adopting deductive logic researchers start with theoretical propositions derived from the literature and develop hypotheses that are empirically testable. Hypotheses are tested using quantitative research methods (experiments and surveys) and statistical modelling techniques. Positivist researchers generally aim to answer questions about relationships among well-defined concepts (expressed as measurable variables) with the purpose of explaining, predicting and controlling phenomena. These aims are framed assuming that scientific research is value-free and that research itself is conducted based on ‘objective’ and value-free ‘facts’. Ethical, moral or normative issues are explicitly excluded from empirical research as being of non-scientific nature (except for the ethical conduct of research in relation to subjects involved in research) (Neuman, 2011).

Interpretive researchers question the unity of science ideal and claim that social and natural sciences examine phenomena of a fundamentally different nature, thus necessitating different meta-theoretical assumptions (Mingers & Walsham, 2010; Schwandt, 2000). Instead of objectivist and realist views, interpretive paradigms are based on subjectivist and relativist assumptions: social reality exists as part of human experience and is socially constructed; any characteristics of an object that can be known result from human subjective and inter-subjective meaning-making and interpretation. Interpretive paradigms study information and knowledge, strategic information systems, enterprise resource planning systems, decision support systems, expert systems and other knowledge-based systems, in context. Interpretive research aims to develop interpretive understanding (verstehen) of these complex social phenomena including their meanings, nature, role and effects in social life (Klein & Myers, 1999). It is more likely to describe and understand phenomena from the participants’ points of view and always involves interpretation by both researchers and actors (Nandhakumar & Jones, 1997). This includes analysis and understanding of participants’ values and feelings in relations to the phenomena studied. Interpretive researchers assume that everything is value-laden and do not believe that value-free social research is possible. They may reflect on their own values but will never judge anybody else’s values.

The newer critical approach, or critical social science, advances a humanist perspective in information systems and knowledge management, and argues that social research should be both reflexive and political (Cecez-Kecmanovic, 2001; Neuman, 2011). Critical social science also aims to provide explanation, description and understanding but, unlike positivist and interpretive research, does not consider them sufficient; critical researchers are motivated by a liberating and emancipating purpose and aim at affecting practical affairs, life and working conditions of people. The key distinguishing feature of critical social research is its concern with moral and ethical questions related to (often hidden) forms of domination, control and exploitation through information systems and knowledge management systems (Brooke, 2002; Cecez-Kecmanovic, 2001; Stahl, 2003). In other words, critical research is oriented towards critique and the transformation of the social order (Cecez-Kecmanovic, 2005; Myers & Klein, 2011).
Critical researchers believe that any research is a moral–political activity even when researchers do not explicitly take a stance and commit to a value position (Neuman, 2011).

Table 5.1 highlights the key meta-theoretical assumptions underlying the three major research paradigms. (See a more detailed analysis in Neuman, 2011.) To illustrate how the chosen research paradigm informs and influences the conduct and reporting of research, we present three examples.

**Positivist, interpretive and critical research paradigms:** Examples from the literature

In order to illustrate the distinct nature of the three research paradigms we now analyse three articles that deal with the same research domain (information richness and communication media) but adopt different research paradigms. The selected articles – see Box 5.1 – are widely known and highly cited. Box 5.1 provides details of the articles and defines key terms.

**Box 5.1**

**Articles for analysis and key terms**

**Articles for analysis**


**Interpretive:** Markus, M. L. (1994). Electronic mail as the medium of management choice. *Organization Science 5*(4), 502-527. (The study adopts a multi-method approach, our analysis focusses on the interpretive aspects of the analysis.)


**Key terms in the articles**

**Equivocality:** synonymous with ambiguity – where multiple and conflicting interpretations exist about a situation.

**Media richness:** communication media are characterised as high or low in richness depending on their ability to facilitate shared meaning. For example, face-to-face communication is classified as having a high degree of communication richness, as it enables instant feedback, multiple cues, language variety, and a personal focus. Conversely, documents, unaddressed reports, fliers, brochures have a low degree of media richness.
### Table 5.1 Meta-theoretical assumptions behind the three research paradigms

<table>
<thead>
<tr>
<th>Paradigms</th>
<th>Positivist</th>
<th>Interpretive</th>
<th>Critical</th>
</tr>
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<tbody>
<tr>
<td>Reason for research</td>
<td>To discover regularities and causal laws so that people can explain, predict and control events and processes.</td>
<td>To describe and understand phenomena in the social world and their meanings in context.</td>
<td>To empower people to change their conditions by unmasking and exposing hidden forms of oppression, false beliefs and commonly held myths.</td>
</tr>
<tr>
<td>Ontology – the nature and existence of social reality</td>
<td>Assumes an ordered and stable reality exists out there waiting to be discovered, irrespective of an observer.</td>
<td>Assumes reality is socially constructed, fluid and fragile, and exists as people experience it and assign meaning to it.</td>
<td>Transcends objective-subjective poles and assumes reality is socially constructed but nevertheless perceived as objectively existing.</td>
</tr>
<tr>
<td>Epistemology – the nature of knowledge and the ways of knowing</td>
<td>Takes an instrumental approach to knowledge: knowledge enables people to master and control events. Knowledge represents reality, is stable and additive; statements about reality are true only if they are repeatedly not empirically falsified.</td>
<td>Takes a practical approach to knowledge; aims to include as much evidence about the subject, the research process and context as possible to enable understanding of others’ lifeworlds and experiences, and how the researchers came to understand them.</td>
<td>Takes a dialectical approach to knowledge. Knowledge enables people to see hidden forms of control, domination and oppression, which empowers them to seek change and reform existing conditions and social order.</td>
</tr>
<tr>
<td>The logic of scientific explanation</td>
<td>The dominant logic of inquiry is hypothetic-deductive: hypothesised relations among variables (logically derived from causal laws or theories) are empirically tested in a way that can be repeated by others.</td>
<td>The dominant logic of inquiry is inductive and develops idiographic descriptions and explanations based on studies of people and their actions in context; explanations need to make sense to those being studied as well as to the researchers and their community.</td>
<td>The logic of inquiry can be deductive and inductive but also abductive, seeking creative leaps and revealing hidden forces or structures that help people understand their circumstances and ways of changing them.</td>
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<td>Ethics and claims about values and normative reasoning concerned with what ‘ought’ to be</td>
<td>Assumes both natural and social sciences are objective and value-free, operating separately from social and power structures; ideally positivist researchers are detached from the topic studied and collect value-free facts.</td>
<td>Questions the possibility of value-neutral science and a value-free research; values are seen as embedded in all human actions (including researchers’) and hence are inevitably a part of everything we study, without the judging of one set of values as better than another.</td>
<td>Any research is a moral-political and value-based activity; critical researchers explicitly declare and reflect on their value position(s), and provide arguments for their normative reasoning.</td>
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The positivist article (Daft, *et al.*, 1987) focusses on the proposition that different communication media have different levels of richness. Communication media with high levels of richness (such as face-to-face communication) are best for dealing with highly equivocal situations, whereas media with low levels of richness (such as unaddressed memos) are appropriate for communications with low levels of equivocality. It is assumed that managers will generally behave rationally, thus selecting media appropriately. Successful managers will be those who match a given equivocality of situations with the appropriate communication media (e.g., in highly equivocal situations managers will use the richest available medium). Information richness theory predicts that uses and users of media will be similar, independent of environments. The article focuses on the process of communication and not on the individual actors or their context, and therefore assumes that the propositions of media richness theory are context independent and can be replicated.

Conversely, Markus (1994) provides rich descriptions to allow the reader to follow her interpretive analysis of data gathered from a wide variety of sources. The results point to the potential usefulness of social definition theory and critical mass theory to understand that use of communication media may depend on the environment and social influences as well as the richness of the media and the equivocality of the communication task. The paper demonstrates that communication richness or leanness emerge from the social context, the interactions between people as well as from communication media. There is a focus on mutual understanding between researcher and actors, and the research is highly context dependent.

Ngwenyama and Lee (1997) reinterpreted Markus’s data from the perspective of critical social theory. They proposed that communication is gauged by how people assess communications, how they orient their actions (towards success or understanding) and become subject to, or free themselves from, distorted communications. The study was motivated by the desire to uncover incidences of communication richness that would escape detection in either a positivist or interpretive analysis, and yet shed light on the managerial use of email in companies. The positivist perspective recognises information richness occurring even when the message is distorted. The interpretive perspective recognises richness as occurring when there is mutual understanding, even if that understanding is “incomplete, false, unclear or inappropriate” (Ngwenyama & Lee, 1997 p. 156). Critical research seeks to recognise that actors need to assess the validity of what is being communicated to emancipate themselves from distortion and manipulation. The focus of the paper is on the communication receivers’ critiques of the validity of what is being communicated and their emancipation from distorted communications. The researchers proposed such critique and emancipation are required for real communication richness to occur.13

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13 The work in Table 5.2 draws on discussion and exploratory writing conducted in 2005 with colleagues Dr Fouad Nagm, Ms Emila Sadrei and Mr Mahmood Chadhar, which we acknowledge with thanks.
Table 5.2 draws on these three articles to illustrate how meta-theoretical assumptions provide a fundamentally different way of seeing the world, even when researchers are examining the same issues.

**Developing research question/s**

An examination of a specific problem or phenomenon typically starts with a literature review. Researchers conduct a literature review in order to find out what is known about the problem or phenomenon, what research directions and paradigms are explored, how the knowledge is acquired and what are the key findings. Moreover, researchers need to critically assess the literature and the state of knowledge related to the chosen problem in order to identify or construct a ‘gap’ in the literature that motivates their study. Apart from identifying and articulating a gap, researchers also need to argue why it is important to fill the gap, i.e., to conduct research that will produce knowledge that fills the identified gap. The articulation of a gap in the literature is an important step towards defining particular research questions that the study intends to answer. We therefore first discuss how a gap is identified or constructed and then examine how it leads to articulation of research questions.

A critique of existing literature often includes claims that literature is incomplete, that certain aspects/phenomena are overlooked, that research results are inconclusive or contradictory, and that knowledge related to the problem of interest is in some ways inadequate (Alvesson & Sandberg, 2011; Barrett & Walsham, 2004). In some cases researchers claim that certain studies, findings, theories or ways of producing knowledge are faulty or inadequate and argue for the need to conduct a new study to correct or address the inadequacies. Such approaches to ‘gap-spotting’ are often adopted for developing research questions from the literature (Alvesson & Sandberg, 2011; Barrett & Walsham, 2004).

Gaps in the literature are rarely obvious or easily identified. Analysis, mapping and critical assessment of literature need to be conducted in creative ways so as to reveal weaknesses, inconsistencies or contradictions in the existing literature on the topic studied (Hart, 2006). Hence gaps are not ‘found’ but are more likely constructed through creative ways of mapping and comparing relevant literature. For instance, the analysis of different papers addressing the same research topic may include classification of results according to some relevant framework or typology. A good example is presented in Schultze and Leidner’s (2002) review paper where knowledge management literature is classified according to Deetz’s (1996) framework that distinguishes among four discourses: normative, interpretive, dialogical and critical. They classified papers based on their explicit or implicit theoretical assumptions within these four discourses. Such a way of presenting and comparing the literature on knowledge management allowed them to assess the literature from a particular angle: while the normative discourse is overwhelmingly dominant, the dialogical and critical discourses are
Table 5.2 Meta-theoretical assumptions in three research articles

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<td><strong>Reason for research</strong></td>
<td>To explain how managers select particular communication media for problem solving and decision-making irrespective of context; the objective is to produce knowledge that will enable organisations to predict and control the implementation of new communication technologies that will contribute to managerial effectiveness and efficiency.</td>
<td>To describe and interpret how and why managers use face-to-face and email communication in a particular organisational context; the objective is to improve understanding of the managers’ use of electronic media in communication processes and the implications for effectiveness.</td>
<td>To critically examine and explain managers’ use of electronic media in communicative processes beyond the achievement of mutual understanding; the objective is to reveal hidden forms of distorted communication and how participants emancipate themselves from distorted communication.</td>
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<td><strong>Ontology – the nature and existence of social reality</strong></td>
<td>Communication medium is conceptualised as a conduit that transports meaning among individuals – as if the meaning were something physical; data are processed into information by technologies and human beings are seen as users of information and passive receivers of the transported meanings. Communication richness is an invariant, objective property of a communication medium and is determined by social cues, capacity for immediate feedback, personalisation and language variety enabled by a medium irrespective of the context; hence media are classified according to level of richness from low (text based) to high (face-to-face).</td>
<td>Communication in an organisation involves meaningful social action, subjective interpretations by managers and others, individual and group consciousness and the lifeworld of people; humans, as intelligent beings in a social context, interpret messages communicated by media in order to understand what a speaker or writer meant. Communication richness is conceptualised as a function of mutual understanding among people: the extent that one person understands what the other meant by saying or writing; people bring about the richness in their communication.</td>
<td>Approached from a critical theory paradigm, communication in organisations involves people capable of acting and interpreting actions by others, achieving mutual understanding and importantly capable of critically assessing validity claims implied by communicative acts (intelligibility, efficacy and effectiveness, truthfulness, rightness and appropriateness. Communication richness is present when a person engages in communicative processes with an attitude to critique or question validity claims and, if needed, emancipate her/himself from distorted communication.</td>
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<td><strong>Epistemology – the nature of knowledge and the ways of knowing</strong></td>
<td>Scientific knowledge explains the appropriate matching of specific communication media (lean vs. rich) with management decision-making situations (equivocal vs. non-equivocal); scientific knowledge accumulates through empirical testing hypothesised</td>
<td>The nature of knowledge is ideographic and is created by studying social activities mediated via communication media in practice, within lifeworld of actors; knowledge about managers’ use of email and other communication media in organisations can be acquired</td>
<td>The nature of knowledge is revelatory and emancipatory; knowledge is acquired by studying the use of communication media to support social actions in situ; the study is sensitive to forms of distorted communication and the ways participants question and</td>
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<td>relationships between variables – message equivocality and a medium richness.</td>
<td>only in context and by investigating meaning construction and sharing.</td>
<td>critique various validity claims and attempt to emancipate themselves.</td>
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<td><strong>The logic of scientific explanation</strong></td>
<td>By depicting the subject matter in terms of dependent variable (media richness) and independent variable (message equivocality) the study empirically tested the hypothesised positive relationship between them; this and two other hypotheses were supported – consistent with observed facts; also no logical inconsistency was found.</td>
<td>The logic of inquiry is inductive and is based on the interpretation of multiple evidentiary types – survey, interview, analysis of archival emails; scientific explanation is developed through idiographic descriptions and explanations based on studies of people, their actions and use of email in a particular context. Markus cross checked her data and analysis with those being studied and found that they resonated with the participants (p. 524).</td>
<td>The logic of inquiry is both inductive and deductive and at times abductive; the study uncovers incidences of communication richness that escaped detection in both a positivist or interpretive analysis, and yet sheds light on the managerial use of email in companies; the authors propose that they are supplying future researchers with better tools to analyse communication richness, namely critical social theory frameworks; they do this by explaining the underlying conditions and previous theories and then analysing Markus's 1994 data using a critical framework, to produce interesting and useful findings, which were not discovered using other theoretical frameworks.</td>
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<td><strong>Ethics and claims about values and normative reasoning concerned with what ‘ought’ to be</strong></td>
<td>Ethics is not considered by the study; the only value addressed is the contribution of the media richness theory to managers’ effectiveness; the study does not ask people about their personal values or norms; the researchers do not explicitly discuss values or norms but implicitly assume that objective and value-neutral data were collected and analysed.</td>
<td>The study examines managers’ personal values, and the social norms of the organisation, and explicates the norms and values to increase understanding of communication media use; different values or points of view of participants are described but are not judged.</td>
<td>The authors are explicit about their own values as well as those underlying the critical social theory that informed their research; they believe a critical paradigm to research is more likely to bring to the surface useful understanding of media and communication richness in organisations than interpretive and positivist paradigms.</td>
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missing. By doing so they identified and constructed a significant gap in the knowledge management literature open for researchers to explore and thus make contributions to the literature.

Gap-spotting may lead to worthwhile research questions that will enable researchers to make important, but incremental contributions to the literature. However, such contribution by its nature would not challenge assumptions underlying existing literature in any significant way. In Alvesson and Sandberg’s (2011) words:

> Whether researchers merely identify or creatively construct gaps in existing literature, they still adhere to the same purpose – namely, “gap-filling” – that is, adding something to existing literature, not identifying and challenging its underlying assumptions, and, based on that, formulate new and original research questions (p. 249).

Another, and more radical approach to a critical assessment of the literature in a particular domain, named ‘problematisation’ (Alvesson & Sandberg, 2011), aims to identify and challenge the assumptions underlying existing theories and findings. While both approaches require critical scrutiny of the literature in the targeted domain, problematisation goes further in revealing, discussing and challenging assumptions that determine how a research problem is understood and investigated and in that sense limits knowledge that can be gained from research. A researcher can also problematise his or her own assumptions and beliefs as well as commonly held assumptions and beliefs. Importantly researchers problematise and challenge assumptions in order to develop novel and interesting research questions that promise to make a significant contribution to knowledge.

Identifying and/or constructing a gap in the literature, or problematising and challenging assumptions, precede or directly lead to research questions. When done convincingly both provide evidence for formulating research questions. The importance of well-formed research questions cannot be overstated. Research questions not only drive research design and selection of methods but also de facto indicate (delimit) the actual contribution of a research project.

Research questions can be formulated at a more general, abstract level and at a more specific, empirical level. A more general, abstract research question will logically follow from the gap in the literature or problematisation of existing theories but is often theoretical and not suitable for empirical investigations. Such a question is important as it indicates what theoretical contribution the research intends to make. A general or theoretical question needs to be developed further into one or more specific research questions that will be empirically tested. While formulating a general research question or questions is desirable, it is not absolutely necessary and many good papers or theses formulate only empirical research questions.

In order to discuss development of well-formed research questions we need to be more specific about the nature of research undertaken. Namely, for positivist
research that uses deductive logic specific research questions need to be precisely defined before empirical research and data collection start. Research questions are formulated using concepts that can be linked to empirical data, also indicating what data need to be collected to answer the questions. If this is not the case, it indicates that research question or questions are not developed enough. In positivist, deductive research a specific research question is often expressed in a form of hypotheses that propose relationship between measurable concepts (variables). When hypotheses are based on or deduced from a theory (or a combination of theories), by testing an hypothesis through empirical research we test the theory.

A good illustration is provided in the paper discussed above by Daft et al. (1987). They first aim to answer the questions: “Why do organizations process information?” They then focussed on the use of communication media (including face-to-face and electronic media) in managerial decision-making and problem solving. Their review of the literature led them to formulate a gap: predictions from the literature – that the increasing use of the electronic communications media will decrease the need for face-to-face communications and also increase managerial efficiency and effectiveness – “have not come true” (p. 356). They then formulate the research problem: “why managers often prefer face-to-face communications for problem solving and decision making?” (p. 356). After developing the concept of media richness as an objective and inherent property of a communication medium (which can be measured on a scale from low to high), and the concept of message equivocality, they formulated three hypotheses:

- **Hypothesis 1.** Managerial information processing will be characterised by a positive relationship between message equivocality and media richness (p. 359).

- **Hypothesis 2.** Managers will select oral media for communication episodes high in equivocality and written media for communication episodes low in equivocality (p. 360).

- **Hypothesis 3.** Managers who are sensitive to the relationship between equivocality and media richness are more likely to be rated as high performers (p. 360).

These hypotheses were tested by studying 60 incidents of managerial communications in a company.

In contrast, in non-positivist and inductive research, formulating very specific research questions before the empirical study does not make much sense. A more general and theoretical question is necessary and often sufficient to determine research design, select research method(s) and initiate the study. More specific questions emerge during the study as the researcher develops deeper understanding of the empirical context and people studied. Even when specific empirical questions are defined in advance (which is typically required for getting ethics approval), it is very likely that they will be changed during the course of the empirical study. Given that in inductive research researchers do not know what they are going to find out in their study, they cannot in advance ask for it. In
studying a particular phenomenon they have to be open to new and unexpected events, situations and issues, as well as learn to ask new questions and seek explanations. In other words, researchers seeking discovery cannot formulate their research question/s in advance, as they cannot specify what they are going to discover. As the empirical study progresses research questions become clearer and more specific but it is not until the interpretation of the empirical data that researchers articulate precisely the final research questions. It is only at the point when a research report (a paper or thesis) has to articulate specific research questions, for which the research provides answers, that the questions need to be finally framed. This is what ultimately matters. The struggles and frustrations with various questions during the empirical study are rarely disclosed.

An example of problematisation of existing literature, and especially the numerous studies of managerial communications confirming media richness theory, is provided by Markus (1994) and discussed in Table 5.2. Markus’ (1994) study provides a well-structured and comprehensive review of the previous studies of electronic communications and media richness theory and also a well-argued critique based on several social theories. Markus (1994, p. 509) then proposed a number of theoretically-grounded research questions:

- How do managers, especially senior managers, use media, especially electronic mail, and why? More specifically, are empirical observations about managers’ use of email consistent or inconsistent with hypothesis derived from information richness theory? Do senior managers make relatively little use of email, compared to low-level managers, and avoid using it for equivocal tasks? Are they more sensitive than lower-level managers to media appropriateness as defined by the theory?

In addition to these Markus (1994, p. 509) proposed the comparison between the predictions based on media richness theory and alternative theoretical explanations:

- Do managers’ perceptions of media appropriateness correspond to the information richness scale? Do managers’ media uses correspond to the theory’s predictions? And do managers’ behaviours correspond to their perceptions of media appropriateness? Finally, if the expected pattern of results is not observed, to what extent can alternative explanations – based on a revised information richness scale or on social definitions of media appropriateness – shed light on the findings?

These questions were answered in the empirical study in a selected company using the survey, analysis of emails and interviews (a mixed method).

The examples of research questions provided here are only for illustrative purposes and are not meant to serve as models. It is actually neither typical nor advisable to formulate a large number of research questions, especially for novice researchers. An important lesson from the examples above is that research
questions have to be carefully worded, using precisely defined concepts and indicating what kind of data need to be collected.

**From research questions to selection of methods**

Formulation of research questions determines *what* is being investigated and *what* kinds of answers should be provided by an empirical study. As we have seen above the type of questions and the way questions are formulated are underpinned by a set of meta-theoretical assumptions. It is not so much that researchers consciously think of their meta-theoretical assumptions and then formulate the research question(s). Rather, researchers’ more or less consciously-held assumptions shape their understanding of the world and the way they approach a particular problem. The assumptions also affect the attitude towards literature review, the formulation of gaps and research aims as well as research questions. As we discussed above, the form of research question(s) and their fixed or evolving nature is aligned with a nature of research paradigms.

To achieve their aims and answer research questions, researchers conduct an empirical study. In order to argue for and justify their empirical study, researchers need to consider several key methodological issues, including meta-theoretical assumptions, overall research strategy, research design and plan of action that link research aims and questions with the choice of research method(s) and techniques, the adoption of selected methods and techniques, and the way knowledge claims are (will be) made. The process starting from the formulation of research aims and questions, and ending with the selection and adoption of methods and techniques is depicted in Figure 5.2. Importantly the choices made along the way need to be well-argued and should follow logically from the research aims and questions.

First, arguments should be provided for a particular meta-theoretical perspective or paradigm – why is it fruitful or necessary for a specific problem to be studied from, e.g., a positivist paradigm? No paradigm is, or should be argued as *a priori*, better than others. Paradigms can be more or less well-suited to empirically study a particular phenomenon and research problem. If for instance the study assumes that media richness is determined by characteristics of a communication medium and aims to develop knowledge about the media richness irrespective of the context, a positivist paradigm can be justified while an interpretive paradigm can be argued to be inappropriate due to mismatch with the initial research assumptions. On the other hand, understanding richness in communication emerging from social interaction mediated by communication technologies within a context would justify an interpretive paradigm.

Second, a research strategy (research design and a plan of actions) for the study needs to be developed. The research design and a plan of actions link the aims and research questions to the choice of research methods and techniques. After an empirical study is situated within a specific paradigm (e.g., positivist, interpretive or critical) the number of possible research strategies that can be adopted to answer research questions decreases. When, for instance, a research question
about managerial choices of communication media in different situations is examined within a positivist paradigm, research design is practically limited to experiments, survey-based method and positivist case studies. Each of these methods would then use certain data collection techniques (e.g., questionnaire, structured interviews) and data analysis techniques (e.g., statistical modelling, content analysis). In the case of an interpretive study of communication richness in managers’ email interactions, research design options would include a field study, ethnography, or an interpretive case study. The adoption of any of these methods would also require certain data collection techniques (e.g., participant observation, field interview, document acquisition, focus groups) and data analysis techniques (coding and thematic analysis, discourse analysis, narrative analysis, etc.). Figure 5.2 illustrates the methodological choices made at each step. The arguments for the methodological choices need to be logically connected and convincing. This is further illustrated in Figure 5.3 which describes the flow of logical reasoning from the meta-theoretical assumptions (objectivist and realist) to paradigms, to methods and techniques.

**Figure 5.2** From formulating research aims and questions to the selection of methods and techniques
Third, the detailed research design and a plan of action need to be developed to provide a comprehensive answer to how questions such as: How is the survey administered and to whom? How are the subjects for an experiment recruited and selected? How is a field site selected? How is a field study conducted? How are interviewees selected? An important aspect of the detailed research design is the selection strategy. For a positivist survey-based study convincing arguments have to be provided for a selection of a sample that is representative of a population studied. The selection of a site (for example a company, department, project) for a field study may be argued for instance as a typical, critical or extreme case, or a purposefully selected or opportunistic case (Miles & Huberman, 1994). A detailed research design and a plan of action should be sufficient and include a comprehensive argument to explain how data analysis will be conducted and knowledge claims made.

Developing a research strategy, that crosses paradigms and uses multi-methods (both quantitative and qualitative) in an empirical study, introduces an additional layer of complexity to the research design. The research strategy in such situations might include a sequence of research phases each of which can adopt a different paradigm; or different segments of a research project going on in parallel can be governed by different sets of assumptions (Mingers, 2003). In both cases the link between the phases or segments of empirical study has to be clearly argued and debated, indicating how the various results will be combined and knowledge claims produced.
Conclusion

This chapter has clearly differentiated methodology (the overall logic of an enquiry) from research methods (the processes, procedures and techniques used to conduct research). Beginning with a meta-theoretical examination of the different paradigms, which made explicit the relations between methodological approach and research methods, we then provided summaries of the ontological, epistemological, axiological and normative assumptions underlying three of the major methodological paradigms – the positivist, interpretive and critical. We illustrated how these sets of underlying theoretical assumptions each provide a fundamentally different way of seeing the world using three seminal articles from the information systems literature. Understanding meta-theoretical foundations enables researchers to adopt a critical attitude towards the literature and knowledge relevant for a research problem of interest. We demonstrated how research questions are formulated by identifying gaps in the literature or through a process of problematising and challenging assumptions, again using examples from the three articles. Finally, we demonstrated how these research questions, carefully formulated and using precisely defined concepts should logically lead to particular research strategy and methods.

In this chapter, novice researchers have been introduced to an advanced level of thinking about the assumptions that inform research and the relationship between methodology, theory and method in the conduct of research. Experienced researchers are provided examples and arguments to stimulate critical reflection on their research practices, their dealing with methodological issues and their choices of, and justification for, particular research methods.

References


Goles, T., & Hirschheim, R. (2000). The paradigm is dead, the paradigm is dead... long live the paradigm: The legacy of Burrell and Morgan. Omega, 28(3), 249-268.


