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## Reviewing the Role of Culture in Strategic Information Systems Research: A Call for Prescriptive Theorizing on Culture Management

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### Abstract:

Culture is an important topic in strategic information systems (IS) research, particularly because information technology (IT) projects are often accompanied by cultural challenges. While culture has been widely analyzed in this discipline, there is a lack of research that systematically examines the role of culture in strategic IS research. With a structured literature review, we investigate the relation patterns between culture, strategy, and IS-related concepts in terms of dependent, moderating, and independent variables and the research approach in terms of descriptive, normative, and prescriptive. Four different patterns emerge, each one closely related to specific forms of theorizing and corresponding research designs. Research streams focusing on descriptive explanations of culture's role are rather exhausted. IS research that builds on a *normative* understanding of culture exists in selected areas, while theorizing on the prescriptive management of culture has been largely neglected despite the relevance of cultural challenges in IS projects. We derive areas for future research and present two themes that emerged in our study to demonstrate how descriptive and normative approaches can provide a foundation for research on the prescriptive management of culture in strategic IS projects: the management of cultural clashes and the management of cultural identity.

**Keywords:** Culture, Strategy, Information Systems, Culture Management, Prescriptive Theorizing.

Both authors contributed equally to this paper.

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## 1 Introduction

Culture is a highly relevant and ubiquitous topic in contemporary information systems (IS) research (Leidner & Kayworth, 2006). It refers to a group's shared values that determine patterns of behavior (Schein, 2004). Knowledge about culture and culture management represents a strategically important asset for successfully leveraging the benefits of information technology (IT) in companies (Aycaan, Kanungo, & Sinha, 1999; Dickson, Den Hartog, & Mitchelson, 2003). The strategic relevance of culture comes from the competitive advantages and sustained superior financial performance that culture can create for an organization (Barney, 1986). Since IT projects often go along with cultural challenges, understanding how culture influences such projects represents a particularly important IS topic (Walsh, Kefi, & Baskerville, 2010).

In fact, scholars have widely examined culture in strategic IS research (i.e., research focusing on managing IT investments that are strategically relevant to business objectives) (Lederer & Salmela, 1996; Segars & Grover, 1998). For example, Leidner and Kayworth (2006) classify various studies under the theme "culture, IT management, and strategy" in a review of IS literature. Further researchers have examined national and organizational culture as a barrier or enabler of strategic, IS-related changes in organizations (Arnott, Jirachiefpattana, & O'Donnell, 2007; Mignon & Janicot, 2009). While such studies typically provide deep insights into specific cases, there seems to be a lack of research that systematically analyzes theorizing on culture in strategic IS research.

Against this background, we examine how research theorizes about the role of culture in strategic IS research. To address this goal, we conduct a structured literature review (vom Brocke et al., 2015). Exploring the relations between culture, strategy, and IS-related concepts (in terms of dependent, moderating, and independent variables) and analyzing the approaches of studies on culture (in terms of descriptive, normative, or prescriptive approaches), we examine how research conceives culture-related issues that arise in strategic IS contexts and systematically overview existing research in the discipline. We contribute to the call from Leidner (2010) to provide new insights how IS influences culture and how one can purposely change culture since we identify related research gaps on prescriptive theorizing and outlines specific areas of future research.

This paper proceeds as follows. In Section 2, we present our understanding of the key concepts of our research and outline dimensions for the analysis of relevant literature. In Section 3, we introduce the literature review method and analysis procedure. In Section 4, we present the results of our analysis. Based on these findings, in Section 5, we discuss research opportunities for prescriptive theorizing on culture management in strategic IS research. Finally, in Section 6, we conclude the paper by outlining implications and reflecting on our study's limitations.

## 2 Research Background

### 2.1 Culture

Culture is a highly complex and intangible phenomenon comprising orientation patterns for behavior (Hofstede, 2001). Central characteristics that most definitions of culture cover include shared norms and collective values (Straub, Loch, Evaristo, Karahanna, & Srite, 2002). However, the understanding of culture and the related underlying assumptions differ substantially based on the context (Kroeber & Kluckhohn, 1952). As a result, scholars often classify culture research according to the level of investigation—typically the national, organizational, and group level (Leidner & Kayworth, 2006; Kummer, Leimeister, & Bick, 2012). In our literature review, we also use this categorization. Therefore, we elaborate on these categories in some more detail next.

Research on national culture differentiates people based on their national backgrounds. One of the most popular studies in this area is from Hofstede, who has identified five cultural value dimensions (power distance, individualism/collectivism, masculinity/femininity, uncertainty avoidance, and long/short-term-orientation) (Hofstede, 1980, 1983). Research in this area shares the understanding that general cultural value dimensions serve to characterize national cultures (Hall & Hall, 1990; Hampden-Turner & Trompenaars, 1993; House, Hanges, Javidan, Dorfman, & Gupta, 2004). Typically, researchers regard the characteristics of national culture as static (Gallivan & Srite, 2005) since they only change in the long run over generations. However, national culture does not exclusively influence people's actions (Karahanna, Evaristo, & Srite, 2005). Behavior may also be dominated by organizational culture.

One of the most important approaches that explains organizational culture remains the approach to the levels of culture that Schein (2004) has proposed, which distinguishes—similar to the iceberg model of culture—between visible aspects (such as the design of the working environment or the clothes of employees) and invisible assumptions that make up the core of culture. Schein acknowledges that other culture researchers refer to these assumptions as values. These underlying assumptions represent subconscious, taken-for-granted beliefs of the organization's members and are, therefore, not challenged. Most other conceptualizations of organizational culture display strong similarities to Schein's approach (e.g., Reichers & Schneider, 1990; Sackmann, 1992; Van Maanen & Barley, 1985).

Another conceptualization of culture refers to group culture. This concept has evolved from the classical dichotomy of national and organizational levels. Rao and Ramachandran (2011), for instance, determine distinct cultures for IS personnel and managers and found that these cultures can cause conflicts. Thus, group culture refers to workgroups in an organization and groups across organizations such as professional groups (e.g., system developers) (Karahanna et al., 2005).

Following the virtual onion model that Karahanna et al. (2005) have proposed, cultural layers (such as national, organizational, and group cultures) around the individual are not fixed but highly dynamic and appear in relation to a specific situation. The theoretical foundation for this approach is the social identity theory (Tajfel, 1972; Tajfel & Turner, 1979). According to this theory, social categories such as nationality, organizational or departmental affiliation, gender, ethnicity, or profession are associated with the individual and determine the individual's social identity and values (Tajfel, 1972; Tajfel & Turner, 1979). The virtual onion model serves as a universal framework for various cultural layers (i.e., cultural identities).

We follow the understanding of culture as norms and values that individuals share and that guide their behavior. We distinguish cultural studies according to the national, organizational, and group culture level.

## 2.2 Relations between Culture and IS Factors

IS factors refer to components of the IS lifecycle, such as IS development, IS selection, IS implementation, and IS use (Gable, 2010; Ward, 2012). The relation of culture to IS factors is manifold: generally, culture can be an independent, dependent, or moderating variable. In our literature review, we apply this distinction to categorize existing research. We elaborate on the three relations in this section and illustrate different levels of culture in various IS themes.

Many researchers have included dimensions of national and organizational culture as independent variables in IS models. For instance, Ein-Dor, Segev, and Orgad (1992) propose a list of national cultural variables affecting IS. Ford, Connelly, and Meister (2003) conducted a citation analysis and found that all of Hofstede's original dimensions have been included as independent variables in IS models and list examples in which the cultural influence on IS factors was significant. Several further examples for this influence can be found in Myers and Tan (2002). Studies with culture as an independent variable often apply Hofstede's (1980) dimensions but also dimensions taken from Hall and Hall (1990) and others (e.g., family orientation).

Culture can also play a moderating role (Ford et al., 2003). Considering, for example, the theory of planned behavior in IS adoption and implementation literature, behavioral intention is based on three predictors: the attitude toward the behavior, subjective norm, and perceived behavioral control (Ajzen, 1988). Ford et al. (2003) found a moderating effect of cultural dimensions (e.g., Hofstede's individualism–collectivism) on the weightings of these predictors. Also Zhang, Zhu, and Liu (2012) uncovered a moderating national cultural effect in relation to IS adoption. The findings suggest that perceived usefulness is more important in Western cultures for adopting mobile commerce while perceived ease of use is more relevant in Eastern cultures (Zhang et al., 2012). Bandyopadhyay and Fraccastoro (2007) identify national culture as a moderator of social influence in acceptance research and propose Hofstede's (1980) dimension of individualism versus collectivism as a key driver of that effect. Focusing on organizational culture, Chockalingam and Ramayah (2013) deem culture a moderator in enterprise resource planning projects.

Researchers have typically investigated effects of IS on culture as dependent variables in relation to organizational culture (Leidner, 2010; Leidner & Kayworth, 2006). Leidner and Kayworth (2006), for example, identify two papers in this context: Doherty and Doig (2003), who study how a firm's data warehousing capabilities change the customer service culture, and Doherty and Perry (2001), who investigate how a new workflow management system (WMS) strengthens organizational culture values related to customer and performance orientation.

The classification of independent, dependent, and moderating variables is not limited to quantitative research approaches even though the terminology stems from these research designs. Since the purpose of both qualitative and quantitative research is to generate knowledge through discovering laws and postulating theories (Bhattacharjee, 2012), we argue that one can apply the classification independent from the type of research method. The classification helps to gain insights on the relations between the examined variables (see Table 1).

**Table 1. Relations between Culture and IS Factors**

	<b>Culture as independent variable</b>	<b>Culture as moderating variable</b>	<b>Culture as dependent variable</b>
<b>Relation</b>	Culture influences IS factors	Culture moderates the relation between IS factors	Culture is influenced by IS factors
<b>Example</b>	Hofstede's (1980) long-term orientation affects IS planning as short- and intermediate-term goals determine Korean IS development (Kim, Peterson, & Kim, 1999/2000).	Perceived usefulness is more important for adopting mobile commerce in Western cultures than in Eastern cultures (Zhang et al., 2012).	Data warehousing capabilities change the culture of a company toward a customer service culture (Doherty & Doig, 2003).

Although research has examined various relations of culture to IS concepts, we are not aware of any studies that systematically overview how IS research theorizes about the role of culture, particularly with regard to strategic IS research.

### 2.3 Approaches of Studying Culture in Strategic IS Research

Strategic IS research deals with the management of IT investments that are strategically relevant to business objectives (Lederer & Salmela, 1996; Segars & Grover, 1998). Research refers to strategic plans for managing IT systems as “system strategy”, “strategic system planning”, or “IS strategy” (Amrollahi, Ghapanchi, & Talaei-Khoei, 2014; Somogyi & Galliers, 2003). An IS strategy aims to align IS with perceived business needs to gain advantage from IT (Earl, 1989; Reich & Benbasat, 2000; Tan & Gallupe, 2006). Generally, strategic IS research and related IS strategy definitions emphasize aspects of the entire IS life cycle, which includes, for example, IS strategy development, IS investment selection, IS implementation, and IS use (Gable, 2010; Ward, 2012). Researchers have identified the needs of governing and working human agencies as essential components of the IS strategy (Besson & Rowe, 2012; Walsh, 2014).

Particularly, researchers often recognize culture as an important aspect of IS strategy due to the human component in IS (Fettke, Houy, & Loos, 2010) and the human agencies in IS strategy development and implementation (Walsh, 2014). Cultural phenomena relating to IS strategy occur in various ways. For example, the strategic decision to outsource an IT development project to another country can be influenced by cultural difficulties due to different values and priorities among the involved individuals (e.g., Lacity, Willcocks, & Feeny, 1995; Samaddar & Kadiyala, 2006). Another example is that a strategic IS decision can also affect the organizational culture. A new IS, for instance, can lead to a transformation process that changes the existing organizational culture (Abraham & Junglas, 2011; Jelassi & Dutta, 1993). The examples suggest that various relations between culture and IS strategy exist.

Apart from various relation patterns, however, we can further identify different approaches in which researchers study culture. For instance, some contributions describe a real-world phenomenon (as is) while other contributions outline an ideal scenario (to be) or even suggest ways to realize such a scenario (how to). To classify different research approaches, we apply an adjusted classification scheme (based on Bell, Raiffa, and Tversky (1988)) that distinguishes between three different research approaches: descriptive, normative, and prescriptive. We can also link these three approaches to Gregor's (2006) theorizing types.

Descriptive (as-is) approaches explore the status quo role of culture. They are, thus, related to theories of analysis and explanation since, in particular, these research approaches focus on what is and address the question when, where, and why phenomena relate to each other (Gregor, 2006).

In contrast, normative (to-be) approaches specify a target culture (i.e., a vision of culture that is ideal in a certain context). The category relates to Gregor's (2006) theories of prediction, which focus on what will be without explaining the underlying effects.



Finally, prescriptive (how-to) approaches provide guidelines and suggestions on how to manage culture challenges to possibly trigger cultural change and develop a particular culture towards the desired culture. The category is related to theories of design and action because it outlines how to do something and gives explicit prescriptions (Gregor, 2006).

The latter category builds on models of culture management such as Lewin's (1951) model of unfreezing, changing, and re-freezing culture, which outlines how to manage culture and has been widely used (Armenakis & Bedeian, 1999). Typically, related research suggests that culture is managed through cultural artifacts and behaviors (Higgins & McAllaster, 2004). Table 2 summarizes each culture approach.

**Table 2. Approaches of Studying Culture**

	<b>Descriptive (as-is) approach</b>	<b>Normative (to-be) approach</b>	<b>Prescriptive (how-to) approach</b>
<b>Purpose</b>	Describe and explain status quo of culture	Analyze and define target culture	Develop culture and/or its management
<b>Reference</b>	Given culture	Ideal culture	Manageable culture
<b>Assumption</b>	Culture is of strategic relevance. Given cultural phenomena need to be understood.	A strategically suitable (ideal) culture exists. Comparing status quo and target culture allows predicting success.	Culture can be managed strategically. The active management of (a given) culture should be facilitated.

We analyze existing research according to these and the previously introduced categories to examine how the current body of knowledge theorizes about the role of culture in strategic IS research.

### 3 Methodological Approach

We based the methodological approach we used to identify relevant research papers on Piccoli and Ives (2005). Following this approach, we selected journal papers through a systematic database search. We selected papers in three steps. At first, we identified papers based on keyword searches in journal databases. Second, we selected papers that seemed to provide an added value regarding the defined research question by examining the title and abstract of the identified papers. Third, we analyzed the selected contributions in detail to examine if they provided an added value for the in-depth literature review.

We used three comprehensive journal databases that cover not only key journals of the IS discipline but also include papers from a wide range of disciplines such as management and organization science. This way, we identified appropriate papers for our research focus independent from the journal or discipline they are published in. We searched the literature by searching title, abstract, and keywords of existing papers. Because we examine the relation between the concepts culture, strategy, and IS, we chose a combination of related search terms. Table 3 overviews our search strategy.

**Table 3. Overview of Our Literature-search strategy**

<b>Criteria</b>	<b>Literature search approach</b>
Databases	EBSCOhost, ProQuest, and Science Direct
Search fields	Title, Abstract, Keywords**
Search terms	"cultur*" AND "strateg*" AND "information systems"
Search period	Available publications until June 2014
** if specifiable	

Overall, we found 273 papers based on our search strategy. Through analyzing the abstracts of those papers, we selected 72 potentially relevant papers. Based on a full-text analysis, we found 33 papers to be relevant for the final in-depth literature analysis. To include it in our analysis, a paper had to clearly address all three key aspects of our research: culture, strategy, and IS. Additionally, the papers needed to identify relations between these concepts (i.e. influences among these concepts). Such relations had to go beyond identifying culture and strategy as important dimensions for IS success (e.g., Fearon, Manship, & McLaughlin, 2013) to include a paper in the analysis. Table 4 shows the results of our literature search and paper-selection process.

**Table 4. Number of Identified Papers in the Journal Databases**

Database	URL	Number of search hits (analyzed abstracts; excluding double hits)	Number of potentially relevant papers (analyzed full texts)	Number of relevant papers (in-depth literature analysis)
EBSCOhost	http://search.ebscohost.com	84	72	33
ProQuest	http://search.proquest.com	113		
ScienceDirect	http://www.sciencedirect.com	76		

The papers for our review originated from 23 different journals. In our further analysis, we examined which level of culture the identified papers studied, and we developed two concept matrices (Tables 6 and 7) that served as a framework of our analysis (Webster & Watson, 2002). These concept matrices are based on two dimensions. First, we examined the role of culture, strategy, and IS in terms of independent, dependent, and moderating variables to specify the relation patterns between the key concepts of our research. Second, we examined the approaches of studying culture in terms of descriptive, normative, and prescriptive approaches.

Regarding the latter dimension, we categorized papers that solely delineate and explain cultural phenomena as descriptive papers. We categorized papers that define a desirable ideal culture as normative and those that focus on the development and management of culture as prescriptive.

Since identifying relation patterns differs depending on the applied research method, we provide some more details as to how we categorized the papers in this dimension. In contributions that apply a quantitative research method, we could directly derive concepts and their relations from the research model. In contrast, conceptual and qualitative studies were more difficult to classify. Therefore, we needed to examine those papers in depth. First, we investigated all publications individually. We used text quotes to identify the relations between culture, strategy, and IS factors and the specific manifestation of these constructs in the study’s context. Then, we discussed every paper and the underlying research model until we agreed on the concept relations. Table 5 provides examples for the classification into relation patterns.

**Table 5. Classification Example for Conceptual and Qualitative Contributions**

Reference	Abdul-Gader (1997)	Akmanligil & Palvia (2004)
<b>Method</b>	Conceptual	Qualitative
<b>Pattern</b>	C → S → IS C: Culture of Arab Gulf countries S: Global IS strategies of multi-national companies IS: IS development	C → S → IS C: Cultural differences between headquarter and subsidiaries S: Global IS development strategies IS: IS success
<b>Exemplary evidence for the identified relation C → S</b>	Culture is presented as an environmental variable that affects the global IS strategies of multi-national companies: “[F]our broad environmental variables can have direct effects upon IS managerial strategies: (1) economic, (2) sociopolitical, (3) legal, and (4) cultural.” (p. 6)	Culture is presented as a factor that influences the global IS development strategy selection: “[O]rganizations in less risk-taking cultures may find some of the development strategies (e.g., MDT [Development with a multinational design team] and PD [parallel development]) too risk-prone.” (p.49)
<b>Exemplary evidence for the identified relation S → IS</b>	The study reports on the influence of global IS strategies on IS operations and application development: “[T]his paper addresses multinational companies (MNCs) IS global policy formulation and several implications for IS management issues in Arab Gulf countries.... Globalizing IS strategy formation is to delineate a structure and direction for MNC IS operations and application development” (p. 3).	The study presents a case on a negative influence of a chosen global IS development strategy (less “risky” central development strategy instead of PD or MDT) on IS success: “[T]he development strategy was changed to give HQ [headquarter] the responsibility of building the entire system. Analysis, design, and coding were to be carried out centrally. ...Currently, development of the system has stopped. Only the first phase out of the planned eleven was completed. ...There were many reasons for discontinuing.... IT executive management started saying that the regions know their needs better than HQ” (p. 52).

## 4 Literature Review

### 4.1 Relations between Culture, Strategy, and IS Factors

Our literature review revealed several types of relationships between our key concepts. Categorizing the papers discovered through our literature search, we focused on the relation between culture (C), strategy (S), and IS factors (IS). Even though all papers addressed the three concepts, dependent and independent variables and the relations between them differed significantly. Our analysis unveiled the following relation models:

- **Concurrent models (or V models)** describe one independent factor that determines two dependent factors or two independent factors that determine one dependent factor. An example relation would be that culture influences strategy and IS factors (expressed as  $C \rightarrow S \ \& \ IS$ ).
- **Fit models (or Y models)** describe the congruence of two factors that is determined by a third one or one factor that determines the fit of two other factors. For example, culture can influence the fit of strategy and IS factors (expressed as  $C \rightarrow S-IS-fit$ ).
- **Chain models (or I models)** describe research frameworks that connect multiple factors in a sequential order. We distinguish between chain models with three concepts (long chain models), which include a mediating variable (e.g., culture affects strategy, which, in turn, affects an IS factor; expressed as  $C \rightarrow S \rightarrow IS$ ) and chain models with two concepts (short chain models), which only include an independent and a dependent variable. The latter models have the specialty that one variable comprises a combination of two key concepts (i.e., strategy and IS factors; expressed as S-IS, which refers to strategic IS or IS strategy).
- **Moderator models (or T models)** describe a relationship between two variables that is moderated by a third one. For example, culture can influence the relation between strategy and IS factors (expressed as  $C \rightarrow (IS \rightarrow S)$ ).

Table 6 overviews the relationship models we identified in the literature. Next, we give insights into the papers that represent the four relationship models.

**Table 6. Relation Models Identified in the Literature**

Type of relation	Description	Illustration	Relation between C, S, and IS factors	Literature sources
Concurrent model (V model)	A and B influence C or A influences B and C		$C \ \& \ S \rightarrow IS$	Arnott et al. (2007), Katz & Townsend (2000), Kivinen & Lammintakanen (2013), Mignon & Janicot (2009), Rajaguru & Matanda (2011), Rajaguru & Matanda (2013), Wainwright & Waring (2004)
			$S \rightarrow IS \ \& \ C$	Kimaro & Nhampossa (2005)
Fit model (Y model)	Fit between A and B influences C or A influences fit between B and C		$C \rightarrow S-IS-fit$	Campbell, Kay, & Avison (2005), Grover, Segars, & Durand (1994), Ravishankar, Pan, & Leidner (2011)
			$C-S-fit \rightarrow IS$	Robey & Rodriguez-Diaz (1989)
			$S-IS \ fit \rightarrow C$	Firth, Mellor, & Francis (2008)



**Table 6. Relation Models Identified in the Literature**

Type of relation	Description	Illustration	Relation between C, S, and IS factors	Literature sources
Chain model (I model)	A influences BC or AB influences C or A influences B and B influences C	$A \rightarrow BC$ $AB \rightarrow C$ $A \rightarrow B \rightarrow C$	$C \rightarrow S-IS$	Jackson (1987), Lai (2008), Pillay, Hackney, & Braganza (2012), Rishi & Goyal (2008), Tsohou, Karyda, & Kokolakis (2006)
			$S-IS \rightarrow C$	Abraham & Junglas (2011), Philip & McKeown (2004), Waring & Skoumpopoulou (2012)
			$C \rightarrow S \rightarrow IS$	Abdul-Gader (1997), Akmanligil & Palvia (2004), Martinsons & Davison (2007), Poon & Yu (2010), Williams (1997)
			$S \rightarrow IS \rightarrow C$	Jelassi & Dutta (1993)
Moderator model (T model)	A moderates the influence of B on C	$B \xrightarrow{\quad} C$ $\quad \uparrow$ $\quad A$	$C \rightarrow (S \rightarrow IS)$	Bradley, Pridmore, & Byrd (2006), Kim et al. (1999/2000), Kim & Peterson (2002, 2003), Kunnathur & Shi (2001), Lai & Wong (2003)

**4.1.1 V Models**

In this category, we identified eight papers that followed two distinct V models. Seven papers followed the most common approach (C & S → IS), while only one paper followed a S → IS & C research model.

**Culture and strategy influence IS factors (C & S → IS):** in studies with this pattern, culture and strategy represent independent variables that influence IS factors, which represent dependent variables. Kivinen and Lammintakanen (2013), for example, conducted a case study on the use of a management IS in the healthcare environment. The authors outline two main requirements for the system use: 1) a strategy for information management to ensure that the IS is considered as a tool in strategic information management from the very beginning and 2) an information culture (i.e., a culture that recognizes the value and utility of information for operational and strategic success) to ensure that the medical staff share all relevant information. Mignon and Janicot (2009) come to similar results and propose a model that calls for a balance of strategic, organizational, technical and informational, and cultural and human factors to guarantee continued IS usage. Their case study focuses on a knowledge management system in a large audit and consultancy firm. While the firm’s strategy supported the use of the IS (i.e., knowledge use and capitalization), successful knowledge transfer was hindered by a lack of information-sharing culture. Focusing on IS integration, Wainwright and Waring (2004) use a conceptual approach to develop a strategic model that calls for a balance between organizational, strategic, and technical factors. They consider culture a key driver of the organizational dimension. The authors recommend that the organizational (i.e., cultural) analysis should be the starting point of an IS integration project. Then, the strategic analysis should take place to specify the technical requirements for IS integration. Similarly, Rajaguru and Matanda (2011, 2013) examine inter-organizational compatibility dimensions as antecedents of inter-organizational information systems (IOIS) integration and supply chain performance. They find that technical, strategic, and cultural compatibilities between supply chain partners influence IOIS and, in turn, supply chain capabilities. Strategic compatibility means, for example, that goals in partnering organizations are compatible and facilitate coordination of common activities, while cultural compatibility means that business philosophies, subjective norms, and values are shared between supply chain partners.

While the previous papers focus on organizational culture, Arnott et al. (2007) focus on national culture and investigate four cases of executive IS (EIS) development in Thailand. The authors introduce the concept of EIS cultural fit, which refers to a cultural and a strategic precondition for successfully realizing EIS development projects in emerging countries (i.e., the similarity of the organization's social and cultural context with that of Western organizations and the similarity of IT policies and methods, such as the IT development strategy, with those of Western organizations). They find that both cultural and strategic similarities determine EIS development success. Finally, Katz and Townsend (2000) examine the impact of national cultures on the IS infrastructure of global competitors and also consider the role of business strategies in IS infrastructures. They derive a conceptual model on this relation and apply it to the national cultures of Japan, the United States, and France. The authors find, for example, that culturally different approaches in information sharing directly affect IS integration between organizations from different countries.

**Strategy influences IS factors and culture (S → IS & C):** Kimaro and Nhampossa (2005) report on strategies for dealing with the unsustainability of health IS in less-developed economies. Based on case studies, the authors find that appropriate sustainability strategies can rationalize the use and sharing of resources and, thus, help unify parallel subsystems (i.e., integrating health IS). Additionally, the study shows that appropriate sustainability strategies related to new health IS also lead to changes that go beyond the technical sphere, which shapes new cultures and new ways of doing things.

**Summary V models:** while the introduced papers stem from research of diverse contextual backgrounds, we observed two dominant topics in the V model papers: 1) the importance of an information-sharing culture for successful IS integration and IS use (Katz & Townsend, 2000; Kimaro & Nhampossa, 2005; Kivinen & Lammintakanen, 2013; Mignon & Janicot, 2009) and 2) the relevance of cultural and strategic compatibilities between two or more entities for successful IS development and IS integration (Arnott et al., 2007; Kimaro & Nhampossa, 2005; Rajaguru & Matanda, 2011; Rajaguru & Matanda, 2013; Wainwright & Waring, 2004).

One can identify both topics on the national and organizational culture level. For example, Katz and Townsend (2000) examine differences in information-sharing behavior between countries, Kivinen and Lammintakanen (2013) and Kimaro and Nhampossa (2005) address information-sharing culture in hospitals, and Mignon and Janicot (2009) examine information-sharing culture in audit and consultancy firms.

Normative culture approaches dominate in the V models (Kivinen & Lammintakanen, 2013; Mignon & Janicot, 2009; Rajaguru & Matanda, 2011; Rajaguru & Matanda, 2013; Wainwright & Waring, 2004). This means that these papers report on a to-be culture (e.g., an ideal information sharing culture) that organizations should achieve. If the users adopt this culture as part of their cultural identity, then the culture functions as an enabler of IS success (Kivinen & Lammintakanen, 2013). Only three contributions take a descriptive culture approach and depict the status quo of a given as-is culture (Arnott et al., 2007; Katz & Townsend, 2000; Kimaro & Nhampossa, 2005), which typically represents a barrier to IS success. Most studies examine the topics through qualitative case studies. Only two publications use a conceptual research approach (Katz & Townsend, 2000; Wainwright & Waring, 2004) and one contribution applies a quantitative survey (Rajaguru & Matanda, 2013).

#### 4.1.2 Y Models

We identified five publications with fit models. Particularly, three different relation patterns occurred. The most popular category includes three papers (C → S-IS fit), while the patterns C-S fit → IS and S-IS fit → C occurred only once each.

**Culture influences strategy-IS Fit (C → S-IS fit):** in this category, research examines how culture influences the fit between strategy and IS factors. Campbell et al. (2005), for example, investigate the alignment of IS strategies with organizational strategies, which depends on the level of cultural integration between the IS and business functions. Through focus groups, the authors find that the strategic alignment between these functions, in turn, depends on communication, collaboration, trust, and shared domain knowledge. However, these prerequisites are often discouraged through organizational cultures that promote competition between departments and, thus, hinder IS/business alignment. Ravishankar et al. (2011) address the influence of organizational subcultures on the alignment of knowledge management systems with organizational strategy. In their case study, they demonstrate the importance of three different subcultures (enhancing, countercultural, and chameleon) in this alignment. We can find another

example of this relation in Grover et al. (1994). The authors examine several factors relevant to IS success, such as the integration of strategic and IS planning. Through comparing organizations in the USA, France, and Korea, they find that national culture influences the alignment of strategic and IS planning. In general, they find Korean organizations to be less participative in nature, which results in top-down strategic planning, while Western organizations integrate planning of top- and functional-level management.

**Culture-strategy fit influences IS factors (C-S fit → IS):** in this category, the fit between culture and strategy influences IS success. Robey and Rodriguez-Diaz (1989) study the case of an accounting IS implementation in two Latin American subsidiaries of one multinational corporation. The authors find that the implementation strategy must be in line with the organizational culture of the receiving company and its national culture for the subsidiary to view the system as a local product (i.e., for the technology transformation to be successful). Despite the fact that the paper explores the relation of the culture-strategy-fit to IS success, the authors also include ideas on how to manage the organizational culture to realize the fit with the organizational strategy. This includes particularly involving the local management and the international division in the implementation team. They find that an implementation strategy that focuses on involving the users in the local subsidiary (e.g., through a transparent communication in the local language) creates an organizational culture that is more open to changes (Robey & Rodriguez-Diaz, 1989).

**Strategy-IS fit influences culture (S-IS fit → C):** Firth et al. (2008) introduce an interesting Y model. Based on semi-structured interviews in a public Australian hospital, they studied how the strategic decision to support one subgroup (the doctors) with a hospital IS at the expense of another subgroup (the nurses) negatively influenced the hospital culture. Nurses were originally regarded as a key source of information but degraded to data clerks through the system implementation, which led to stress, a lack of job satisfaction, and low commitment to the organization. As a result, a cultural clash occurred between the two group cultures (nurses and doctors). The paper shows that a lack of alignment of hospital IS and hospital strategy can cause a clash between administrative and clinical cultures.

**Summary Y models:** while our analysis revealed three different fit-models with distinct foci, we can identify some common general findings in the Y model papers. In general, most identified papers use organizational culture as the dominant culture concept and examine it as an independent variable. Grover et al. (1994) constitute the only exception because the paper focuses on national culture. Grover et al. (1994) is also the only paper to use a quantitative research approach. All other papers apply a qualitative research approach. Most of them examine case studies. Only Campbell et al. (2005) is based on focus groups of senior IS managers from different companies and does not represent a particular case.

Overall, the identified papers perceived culture mainly as a potential hindrance to successful IS management due to competing (Campbell et al., 2005), differing (Grover et al., 1994; Robey & Rodriguez-Diaz, 1989), or non-involved (organizational sub-) cultures (Firth et al., 2008; Ravishankar et al., 2011). Strategy-IS alignment represents an important theme in these contributions. The alignment can be influenced by culture (Campbell et al., 2005; Grover et al., 1994; Ravishankar et al., 2011), but it can also influence culture in turn (Firth et al., 2008).

While most papers report on culture's role in a descriptive as-is modus, one paper (Robey & Rodriguez-Diaz, 1989) takes a normative approach toward culture and even slightly touches on how to manage culture in a prescriptive way. Robey and Rodriguez-Diaz (1989) suggest that it is possible to forge a culture that promotes change. They emphasize how a culture should look to fit the corporate strategy, and they also provide first ideas on how to manage organizational culture to realize IS implementation success (Robey & Rodriguez-Diaz, 1989).

### 4.1.3 I Models

Overall, we identified 14 papers with a clear sequential order of influencing and influenced factors. Eight papers represent short chain models (C → S-IS; S-IS → C), which only contain an independent and a dependent variable, while one of these variables combines the strategy and the IS concept (i.e., strategic IS or IS strategy). Six papers represent long-chain models, which also contain a mediating variable (C → S → IS; S → IS → C).

**Culture influences strategy-IS factors (C → S-IS):** in an early conceptual contribution, Jackson (1987) introduces culture as a new perception of organizations at the time (as opposed to the perception of

organizations as machines). Based on this organizational understanding, he argues that strategies for information management need to be reconsidered. For example, system strategies should include new roles of information management specialists that consider cultural value systems (Jackson, 1987). Also focusing on organizational culture, Pillay et al. (2012) explore culture as a factor that informs strategic IS change management. Based on interviews with practitioners from the banking sector, they find on the one hand, for example, that culture sows the seed for change and helps to manage user resistance. On the other hand, culture can also be manipulating and even distracting for strategic IS change. Thus, the findings suggest that one should recognize and harness culture for strategic IS change. Similarly, Rishi and Goyal (2008) analyze, through an expert survey, how organizational culture influences the implementation success of strategic IS. They identify variables of organizational culture, such as the involvement of the systems department or departmental interest in systems growth, to be relevant in this context.

Focusing on national culture, Lai (2008) explores the cultural distance between affiliation and parent company as an environmental factor that determines global IS strategies of foreign affiliates. Based on survey data, Lai develops a framework to explain when a globally integrated IS strategy is preferred rather than a locally responsive or multi-focal IS strategy. The results suggest, for example, that affiliates with small cultural distance from the parent tend to pursue a globally integrative strategy. Also studying national culture, Tsohou et al. (2006) examine the potential of cultural theory as a sensitizing device for developing IS risk-management strategies. The findings reveal four distinct strategies based on the four worldviews of the grid/group typology. The paper suggests key cultural issues one should consider when developing risk-management strategies.

**Strategy-IS factors influence culture (S-IS → C):** Abraham and Junglas (2011) describe how implementation strategies of healthcare information systems cause organizational culture transformation in hospitals. The authors use the case of a successful system implementation to examine how the IS implementation process contributed to organizational transformation. The authors conclude that a planning strategy that emphasizes collaboration and involvement initiates changes of the professional and organizational culture. As a result, the paper addresses the effects on both organizational and group culture. Presenting similar findings, Philip and McKeown (2004) use the cultural theory of grid and group from Douglas (2003) to examine the impact of IS strategies on organizational culture. The case of an aerospace/engineering company that underwent successful radical transformation from the 1980s onwards shows that the company's IS strategy and the related implementation of integrated systems triggered cultural change and significantly enhanced communication and performance. Waring and Skoumpopoulou (2012) present a similar case in a university context, where a new strategic IS integrated three prior systems of student data management. However, the implementation did not lead to a shared culture. Instead, "winners" and "losers" emerged because some users gained responsibilities through the system while others became de-skilled data-entry clerks. Therefore, a cultural clash similar to that described by Firth et al. (2008) occurred between different cultural groups. Waring and Skoumpopoulou conclude that emerging cultural changes are highly complex and dynamic and that unforeseen effects can have negative consequences.

**Culture influences strategy influences IS (C → S → IS):** in this relation pattern, strategy serves as a mediating variable between the independent variable culture and the dependent variable IS. A typical paper representing this structure is Akmanligil and Palvia (2004). The authors develop a conceptual framework for selecting a global IS-development strategy (e.g., development with a multinational design team, best-in-firm software adoption). This framework identifies culture (describing differences among subsidiaries and headquarters) as a factor influencing the selection of a global IS-development strategy, while the latter influences IS success. The authors examine four case studies based on the framework and uncover cultural challenges such as cultural clashes. Similarly, Martinsons and Davison (2007) report on the influence of national cultures on strategic decision making, which, in turn, influences the development and deployment of effective decision support systems (DSS). The results suggest that cultural differences in analyzing and conceptualizing strategic decisions exist. Thus, the authors question the global applicability of DSS and executive information systems. Furthermore, Abdul-Gader (1997) investigates the IS global policy formulation of multinational companies operating in Arab gulf countries. In his conceptual work, the author emphasizes differences in national culture between Western and Arab Gulf countries. He finds that culture determines which IS strategy is required for IS management to be successful. For instance, Gulf Arabs expect their leaders to make decisions for them autocratically (i.e., participative IS development project management may not be suitable in this context). In a case study, Poon and Yu (2010) examine the influence of national culture on ERP system procurement practices.



They find that decision making strategies, which differ largely between countries in the East and the West, are important factors that determine ERP system procurement and adoption. The same relation pattern occurs in Williams (1997). However, this contribution is normative and focuses on organizational culture, while the previous contributions are descriptive and focus on national culture. Williams (1997) suggests that organizational culture should be considered in strategically planning IS investments; such decision making would, in turn, determine the development of IS.

**Strategy influences IS influences culture (S → IS → C):** while culture has played the role of an independent variable before, in this chain model, culture is influenced by the IS system, which, in turn, is influenced by strategy. Jelassi and Dutta (1993) report on fundamental changes in business strategy that BP Chemicals took to remain globally competitive. The company's decision to redesign its strategic business led to an integration of its international commercial activities through one global IS. Implementing this IS was at the core of the strategic-change project and triggered the promotion of a unique company culture that merged the plurality of different cultures that had emerged through the organization's rapid expansion in the past. Consequently, the study illustrates how an IS can transform multiple group cultures in a holistic organizational culture (Jelassi & Dutta, 1993).

**Summary I models:** I models are present in studies on all cultural levels. Contributions that focus on national culture consider culture as an independent variable. In this context, one of the main research streams focuses on the cultural distance between subsidiaries and headquarters in different countries (Abdul-Gader, 1997; Akmanligil & Palvia, 2004; Lai, 2008). These papers consider cultural distance to cause key difficulties for IS change management in global organizations. Interestingly, the authors use different methodological approaches to explore the phenomena in a descriptive way. While Abdul-Gader (1997) uses a conceptual approach, Akmanligil and Palvia (2004) apply a case study design, and Lai (2008) uses a quantitative research approach to investigate cultural clashes between subsidiaries and headquarters. Another topic that emerged in contributions to national culture is the effect of cultural differences in strategic decision making on IS-related factors such as IS implementation (Martinsons & Davison, 2007; Poon & Yu, 2010).

However, further contributions use I models in relation to organizational and group culture. Contributions focusing on the organizational culture as an independent factor are often normative. Jackson (1987), Pillay et al. (2012) and Williams (1997) all share the idea that an ideal culture exists that has positive effects on organizational goals. When papers examine culture as a dependent variable, a key theme describes the influence of an implementation strategy on organizational or group culture. Waring and Skoumpopoulou (2012), for instance, present a case in which strategy affects organizational culture negatively. A cultural clash occurred that ultimately had negative consequences for IS success (e.g., through creating clear winners and losers). In contrast, Philip and McKeown (2004), Abraham and Junglas (2011) and Jelassi and Dutta (1993) present cases in which a positive affect arose. Philip and McKeown (2004), for example, show how a new information system supported the introduction of a new and preferable organizational culture. Abraham and Junglas (2011) investigate information-sharing culture in hospitals and identify that insufficient knowledge about the information needs of user groups is a main driver of organizational conflicts. The authors present a case in which the IS strategy forged a shared culture that helped to overcome the conflicts (Abraham & Junglas, 2011). Similarly, Jelassi and Dutta (1993) report on a case in which several different group cultures existed. Occurring cultural clashes could be settled due to an IS strategy that focused on developing a new integrated system (Jelassi & Dutta, 1993).

#### 4.1.4 T Models

We identified only one type of T model with six papers overall containing a moderating variable that influences the relation between an independent and a dependent variable.

**Culture moderates the impact of strategy on IS factors (C → (S → IS)):** all IS factors in this relation pattern refer to IS effectiveness or IS success. Lai and Wong (2003), for example, empirically examine the relationship between global IS strategy and global IS effectiveness with a particular focus on the moderating effects of local culture. With a survey of foreign affiliates in Canada, Japan, the UK, and the US, the authors test several hypotheses on this relation and confirm that the cultural distance (based on the culture dimensions of Hofstede (1980)) between parent organization and affiliation is a significant moderator of the global IS strategy-effectiveness relationship. Similarly, Kim et al. (1999/2000), Kim and Peterson (2002), and Kim and Peterson (2003) empirically analyze the relation between IS development/implementation strategies and IS development/implementation success. Conducting surveys



among IS developers in the US, Korea, and Japan, they find that the perceptions regarding strategies for successful IS implementation differ according to the cultural background. The results confirm the moderating effect of national culture on the perception of successful development and implementation strategies. In contrast, Kunnathur and Shi (2001) focus on the impact of strategic IS planning on IS planning success. Surveying firms in the Chinese stock market, the authors find, for example, that Chinese managers do not use IS strategically to the same extent as U.S. managers. The results suggest that national culture moderates how far strategic IS planning leads to actual IS planning success. Bradley et al. (2006) examine how far the quality of the strategic IT plans influences IS success. Based on a survey among IS executives, they find, for example, that IT plan quality has a greater impact on IS success in organizations with an entrepreneurial culture than in those with a more formal culture. The results suggest that culture functions as a moderator of the relation between IT plan quality and IS success.

**Summary T models:** studies with a T model relation pattern only occur with culture as a moderating variable. These models relate in particular to national culture. Interestingly, papers focusing on a national culture consider differences only between Asian (China, Japan, Korea) and Western countries (Canada, UK, US). Lai and Wong (2003), Kim et al. (1999/2000), Kim and Peterson (2002), Kim and Peterson (2003), and Kunnathur and Shi (2001) investigate the moderating effect of these two cultural areas. Only Bradley et al. (2006) study organizational culture and examine its moderating effect on the relation between IS strategy and IS success.

All papers in this category use quantitative approaches at their core. However, most papers test only the relation between strategy and IS success statistically and use cultural phenomena conceptually to interpret differences. Kim and Peterson (2002) and Kim and Peterson (2003) draw on Hofstede's (1980) cultural dimension of power distance to explain identified differences. Kunnathur and Shi (2001) and Kim et al. (1999/2000) do not use dimensions from culture research but rely on related IS literature to explain cultural differences in the relationship between strategy and IS success. As a result, their findings are based on conceptual reasoning rather than empirical evidence. In our sample, only Lai and Wong (2003) measure a cultural distance index based on Hofstede's (1980) dimensions in their research design. Interestingly, we also found that all papers describe cultural differences and related problems without outlining possible ways how to overcome these challenges.

## 4.2 Approaches of Studying Culture and Identified Research Gap

While we have already touched on descriptive, normative, and prescriptive research approaches in our analysis, in this section, we provide more details on this dimension. Overall, with 1) our categorization of papers according to how they study culture (i.e., descriptive vs. normative vs. prescriptive), 2) our examination of the relation of the culture concept to strategy and IS-related concepts (i.e., dependent vs. moderating vs. independent variable), and 3) our analysis regarding the level of culture that papers mainly address (i.e. nation vs. organization vs. group), we overview the literature on the role of culture in strategic IS research (see Table 7).

We can see that all contributions of our literature review follow either a descriptive or a normative approach to studying culture. Indeed, we found no contribution that follows a prescriptive approach. However, the overview helps to identify research clusters that are particularly suitable to stimulate prescriptive research on cultural management. Next, we summarize the descriptive and normative approaches before deriving implications for prescriptive approaches.

### 4.2.1 Descriptive Approaches

Descriptive (as-is) approaches explore culture's status quo role. They are most common in our paper sample and cover a wide range of topics. We identify several themes among the papers using this approach.

In one common theme, papers describe cultural differences and related conflicts as a barrier to IS success from a status quo perspective (e.g., Akmanligil & Palvia, 2004; Katz & Townsend, 2000; Poon & Yu, 2010). Such studies focus on national culture, explore strategic IS phenomena in various countries, and simply contrast the findings between those countries—typically in V or I models. While they do not empirically analyze cultural phenomena, they most commonly refer to Hofstede's (1980) cultural dimensions to conceptually explore the differences between the research findings in the countries studied.

A key characteristic of this approach lies in the fact that it only supposes cultural relations but does not test them as part of a research model.

**Table 7. Role of Culture in Strategic IS Research**

	Level of culture	Descriptive (as-is) approach	Normative (to-be) approach
<b>Culture as independent variable</b>	Nation	Abdul-Gader (1997), Akmanligil & Palvia (2004), Arnott et al. (2007), Grover et al. (1994), Katz & Townsend (2000), Lai (2008), Martinsons & Davison (2007), Poon & Yu (2010), Tsohou et al. (2006)	<i>Robey &amp; Rodriguez-Diaz (1989)</i>
	Organization	Campbell et al. (2005), Rishi & Goyal (2008)	Jackson (1987), Kivinen & Lammintakanen (2013), Mignon & Janicot (2009), Pillay et al. (2012), Rajaguru & Matanda (2011), Rajaguru & Matanda (2013), Wainwright & Waring (2004), Williams (1997)
	Group	Ravishankar et al. (2011)	
<b>Culture as moderating variable</b>	Nation	Kim et al. (1999/2000), Kim & Peterson (2002), Kim & Peterson (2003), Kunnathur & Shi (2001), Lai & Wong (2003)	
	Organization	Bradley et al. (2006)	
<b>Culture as dependent variable</b>	Nation	<i>Firth et al. (2008), Philip &amp; McKeown (2004)</i>	<i>Kimaro &amp; Nhampossa (2005)</i>
	Organization	<i>Abraham &amp; Junglas (2011), Jelassi &amp; Dutta (1993), Waring &amp; Skoumpopoulou (2012)</i>	

Note: papers stimulating prescriptive research in italics.

In another main theme, papers explain and predict the relationships between culture and IS concepts. We observe this approach typically in relation to national culture and particularly in T models. A dominant theme in this research cluster is the cultural adaptation of Western IS concepts. Papers with this approach often focus on IS strategies adopted in another cultural area. Authors typically collect empirical data only in one country (e.g., in Asia) and compare them to the results from prior studies in other countries (typically in the Western world) that developed a general strategic framework (e.g., Kim et al., 1999/2000; Kunnathur & Shi, 2001). The papers then explain and also predict the success of strategic IS projects across countries. However, these papers often exhibit substantial limitations because they compare their results with older findings derived from studies in which the original concepts were developed without a cultural perspective.

Additionally, we identified a theme in the descriptive studies that outlines organizational culture as a factor that influences strategy-IS alignment (e.g., Campbell et al., 2005; Ravishankar et al., 2011). We typically observed this approach in Y models. These studies state that differing or competing cultural groups can be the reason for unsuccessful IS management that manifests, for example, in a lack of strategic alignment between (competing) functions. A related research stream explores the reverse relation (i.e., that culture is a factor influenced by strategy-IS alignment) (Firth et al., 2008). In this context, studies have found that a lack of alignment between organizational strategy and implemented IS, for example, causes clashes between organizational group cultures. These studies mainly focus on qualitative exploratory analyses to address culture descriptively and explain its relation to strategy and IS-related concepts.

### 4.2.2 Normative Approaches

Normative (to-be) approaches outline an ideal culture. Overall, we identified one typical theme among papers with this approach. The theme relates to organizational culture and the positive role of culture as an enabler of IS success. An example we found multiple times is the knowledge or information-sharing culture (e.g., Kivinen & Lammintakanen, 2013; Mignon & Janicot, 2009). If this culture becomes part of users' cultural identity, then this research stream regards such a culture as universally beneficial. It enables an organization to achieve its goals by overcoming individual issues (e.g., competition between employees), and, thus, this research stream perceives it as a desirable culture. Models in this cluster mostly focus on conceptual and qualitative research. Research has not applied instruments to quantitatively measure culture; instead, it focuses on explorative rather than confirmative analyses.

### 4.2.3 Prescriptive Approaches

We found no prescriptive (how-to) approaches that provide guidelines on how to manage culture challenges or how to develop culture towards the desired to-be culture in our sample. Based on our literature review, we found that existing papers on culture in strategic IS research seem to neglect theorizing on culture management, which is surprising because the contributions that we examined provide evidence for the relevance of cultural challenges in IS projects, but, at the same time, we observe hardly any attempt to address this issue.

Based on this lack of research, we call for authors to theorize about culture management to facilitate strategic IS management. To stimulate research in this area, we derive suitable themes from the identified literature. While no contribution clearly focuses on prescriptive theorizing, we identify two paper types that are particularly insightful. First, papers in which culture serves as a dependent variable contain insights into how culture could be influenced and, therefore, deliberately managed. Second, normative contributions potentially provide ideas on how an ideal culture should look in order to improve IS success. Even though normative contributions often consider an ideal culture as an independent variable in their underlying research models, they often contain ideas on how one can achieve a to-be culture.

In Section 5, we look more closely into these types of contributions to derive implications for prescriptive research and discuss reoccurring themes.

## 5 Discussion of Prescriptive Research Potentials

Our literature review revealed several approaches to theorize about culture in strategic IS research. Most papers in our sample follow a descriptive approach to culture, and the remaining ones take a normative perspective. Yet, we observe a lack of research on prescriptive theorizing on culture even though the prescriptive approach is substantially important for explaining how to overcome cultural challenges and for consciously triggering effects that help to shape culture.

Therefore, we discuss areas for future prescriptive research that we derived from our literature review. Particularly, we identified two themes relevant for culture management. These themes serve as suitable anchors for research initiatives on prescriptive theorizing and concern the management of 1) cultural clashes and 2) cultural identity in strategic IS settings. The two themes have related yet different foci. While examining cultural clashes focuses on obvious cultural differences that serve as barriers to business, studying cultural identity covers cultural commonalities that can serve as an enabler to business. In Sections 5.1 to 5.3, we explain the two themes and their relation to outline potentials for prescriptive research on culture in strategic IS contexts.

### 5.1 Management of Cultural Clashes in Strategic IS Contexts

We identified several contributions, particularly those on culture as a dependent variable, that describe cultural clashes. Firth et al. (2008), Waring and Skoumpopoulou (2012), and Jelassi and Dutta (1993) demonstrate how implementing a new system led to cultural clashes between organizational groups. Due to IS implementations, work processes changed as some activities were automated while others were assigned to different roles. As a result, the perceived status of the employees in the organization changed and created winners and losers of the implementation strategy (Waring & Skoumpopoulou, 2012). Interestingly, the contributions are similar in that they take place in environments where one group can accumulate substantially more power than another one. Firth et al. (2008), Kivinen and Lammintakanen

(2013), and Abraham and Junglas (2011) focus on hospital staff, and Waring and Skoumpopoulou (2012) focus on academic and administrative staff in a university.

A special characteristic of the cultural clashes in these cases refers to the different effects of the IS-implementation strategy on the organizational groups. In the examples, the new IT system changes roles and responsibilities and the appreciation of specific tasks. If, for instance, administrative staff that previously conducted supportive tasks receive responsibility for management tasks, a cultural conflict can occur that may trigger a new organizational culture (see Waring & Skoumpopoulou, 2012). From a strategic perspective, organizations can consciously manage such cultural clashes by considering the implications of system implementations on roles and responsibilities. Organizations could even use cultural clashes to facilitate cultural changes. For example, an organization may use a new IT system that provides a specific group with new responsibilities to change its existing organizational culture.

Consequently, future research may explore how far strategic management can use IS implementations to initiate culture clashes that lead to desired cultural change in organizations. However, a cultural clash does not necessarily lead to a preferable organizational culture. Abraham and Junglas (2011), for instance, report primarily on negative effects that arose as a result of a new system and the related cultural clash. Therefore, we consider the cultural identity concept as a complementary aspect to cultural clashes.

## 5.2 Management of Cultural Identity in Strategic IS Contexts

We identified various contributions, particularly those with a normative approach to studying culture, on cultural identity. Cultural identity can stimulate further research on prescriptive culture management because it explains how a specific organizational cultural identity can dominate existing subcultures in order to facilitate an IS-implementation strategy (Karahanna et al., 2005). Cultural identity relates to national, organizational, and group culture identities since all levels of culture represent strategically important factors in IS projects (Karahanna et al., 2005). Typically, IS research explicitly focuses on either national, organizational, or group culture. However, these cultural identity concepts are strongly interrelated (Karahanna et al., 2005; Leidner & Kayworth, 2006) as the following example of global IS implementation projects demonstrates. Robey and Rodriguez-Diaz (1989), for instance, show that the success of IS-implementation projects depends on the capability to include organizational and national cultural elements that staff members can connect to. Despite the interrelation of cultural identities, studies relating to the management of cultural identity mostly focus on organizational culture. For example, Kimaro and Nhampossa (2005) conclude from case studies in emerging countries that organizations need to change their culture when they introduce new health systems. Therefore, such a system's users should be members of the development team in order to take ownership and to share values that forge a cultural identity. Similarly, Pillay et al. (2012) describe how an organization harnessed its organizational culture to create momentum and facilitate an IS change project. Management developed a sense of professionalism about the change and influenced people at team level to build coalitions and a culture committed to change.

The above examples suggest that a particular cultural background of IS decision makers influences IS management but, at the same time, that shared corporate values can also dominate values from employees' other personal backgrounds (i.e., organizational culture and group culture values can overlap national culture values due to the multiple cultural identities that individuals have) (Karahanna et al., 2005). In this context, the papers we identified (Kimaro & Nhampossa, 2005; Pillay et al., 2012; Robey & Rodriguez-Diaz, 1989) suggest that organizations can strategically use IS to create a dominant culture.

Therefore, we propose that organizations can apply an IS-implementation strategy to forge a new organizational culture that dominates pre-existing subcultures. We argue that managing cultural identities can positively influence organizational performance. We concur with literature on culture management that suggests a positive relation between cultural change and organizational performance because shared values that support organizations' goals increase their effectiveness (Willcoxson & Millett, 2000).

Against this background, future research should study multiple group identities in IS projects (e.g., regarding the question of which mechanisms are required to manage diverse cultural groups involved in strategic projects and to create a shared cultural identity). For example, studies should investigate multicultural settings that enrich teams (e.g., creative solutions due to different mindsets), and research should also examine how to select an appropriate strategy that considers both positive and negative effects of culture management.



### 5.3 Relation between Cultural Clashes and Cultural Identity

Even though cultural clashes and cultural identity represent two separate phenomena in the literature, they are strongly interrelated. To illustrate this interrelation, we refer to a reoccurring theme in the examined papers (i.e., the information-sharing culture). Typically, researchers have investigated information sharing in contexts where an IS strategy is selected to forge a company-wide information-sharing culture, but differences between user groups cause cultural clashes (Kimaro & Nhampossa, 2005; Kivinen & Lammintakanen, 2013; Mignon & Janicot, 2009). Papers on this topic emphasize that an information-sharing culture has solely positive effects on knowledge management and IS usage in organizations. As a result, research suggests promoting and developing an information sharing culture between user groups throughout organizations (Kivinen & Lammintakanen, 2013). However, a substantial barrier in this regard is users' cultural background (Kivinen & Lammintakanen, 2013). Cultural clashes occur when employees share a particular culture that negatively affects their information-sharing behavior and when misunderstandings regarding information needs between user groups arise (Kivinen & Lammintakanen, 2013). All papers that cover information sharing as a topic outline a similar scenario in which a new system initiated changes in the existing group cultures and finally the overall organizational culture. These findings tie in with research on culture management that outlines how to deal with cultural clashes and how to overcome clashes using cultural identity to actively shape organizational culture (Deal & Kennedy, 1983).

While we identified a strong relation between the themes of cultural clashes and cultural identity, strategic IS research seems not to have examined this relation in detail yet. Thus, future research should explore how far culture clashes in IS projects may be used to initiate the development of a desired cultural identity among employees. More generally, research should further theorize about how culture change can be managed during an IS project, which, as for cultural clashes, leads to the question of how conflicts are managed to achieve the targeted outcome. Thus, research should investigate how far strategic decision making can control and steer cultural change in IS projects. Regarding cultural identity, we require more research combining different types of culture and their effect on IS to understand the mechanisms that determine the dominant social identity in specific contexts. Such research is particularly relevant to identify the main drivers of individuals' values and behavioral patterns. Further research should theorize about these aspects to facilitate a conscious management of culture and to steer IS success.

## 6 Implications, Limitations, Conclusion

### 6.1 Implications

Previous research has studied culture in relation to strategic IS in various ways (Leidner, 2010; Leidner & Kayworth, 2006; Merali, Papadopoulos, & Nadkarni, 2012; Walsh et al., 2010). Our contribution extends prior work because we are the first to systematically analyze the relation between culture, strategy, and IS factors. We found four general types of relation models studied in literature. The models indicate that strategic IS research has considered culture in various ways because each model builds on specific assumptions and focuses on particular methodological approaches. The suggested models help to position future research and to explain the type of relation between key concepts in a standardized way. Particularly, qualitative and conceptual research may benefit from this standardization because such research typically neglects to explicitly outline the relation between key concepts under review. Furthermore, quantitative research can benefit from our findings to frame research projects and explore if qualitatively identified phenomena can be confirmed statistically. The distinction between the four types of research models may also be applied to research beyond a focus on strategic IS research phenomena. Thus, our study may serve as a reference for structuring concept relationships in other research areas and disciplines.

In particular, our results uncover that research on the strategic management of culture is currently missing. Previous studies have called for research on the impact of IS on culture and on purposefully effectuated cultural change in organizations (Leidner, 2010; Leidner & Kayworth, 2006). However, our research goes one step further because we outline specific themes for future research to theorize about how culture can be managed strategically in IS projects. Managing cultural clashes and managing social identity in multicultural settings represent two topics that serve as anchors for future research initiatives. Further, future IS research can build on the conclusions we derive from our literature review. We consider prescriptive theorizing as one of the essential next steps in strategic IS research because, in particular, we confirmed via analyzing the literature the relevance and strategic importance of culture in an IS context.



Considering that national, organizational, and group culture can strongly influence IS projects and that every IS project can also influence culture (Firth et al., 2008; Waring & Skoumpopoulou, 2012), theories on culture management seem to be fundamental. In this context, we emphasize that the management of culture may include managing national culture phenomena on an individual level (obviously national culture change is out of scope). A strong organizational culture, for instance, can dominate values stemming from national culture. Our discussion provides directions for future research in this area.

Additionally, our study contains important implications for practice. Gaining a systematic overview of the role of culture in relation to strategic IS issues provides a basis for understanding how to deal with intangible cultural phenomena in IS projects. For example, papers that we classified as following a T model provide insights into how national culture moderates the influence of strategy on IS-related factors. In particular, Western companies that expand to Asian countries can adjust their IS strategies based on the rich findings in that area. Additionally, we need to understand the possible trade-off between a presumably positive influence of culture management on organizational performance and a possible negative influence of culture management on an organization (e.g., on employees' commitment). Further research on cultural management could help to provide insights on both the management of culture change and culture maintenance that provides direct insights for practitioners since future research can provide comprehensive guidelines on how to handle culture in strategic IS projects.

## 6.2 Limitations

Our research approach contains the following limitations. The structured literature search revealed only a certain number of relevant papers. Thus, we can only generalize our findings to these papers' specific focus (i.e. strategic IS research). While we assume that the lack of theorizing about culture management also generally holds true for IS research, we cannot generalize our findings to overall IS research. We chose this particular research focus because we consider culture as a factor relevant on a strategic level.

Furthermore, we searched only for papers that explicitly focus on the three concepts of culture, strategy, and IS. Through systematically collecting papers, we intended to comprehensively overview research in this area. In the IS domain and in related disciplines, such as management research or cross-cultural research, additional contributions may exist that do not include the search terms in title, abstract, and keywords. Additionally, research referring to other concepts but similar phenomena might provide further insights to our findings. Extending our literature-search approach could reveal further papers relevant to the theme of our research, and, therefore, we recommend that future contributions take such an approach.

## 6.3 Conclusion

We examined papers that theorize about the role of culture in strategic IS research. Conducting a structured literature review, we analyzed the relations between culture, strategy, and IS concepts to understand the extent to which research has studied culture-related issues that arise in strategic IS contexts. We contribute to the existing body of knowledge by systematically overviewsing the research in this area. In this context, we identified four different models, each with a unique understanding of the relationships between the key concepts of our research. Furthermore, we found that strategic IS research focuses particularly on describing and explaining observed culture-related phenomena but also covers normative approaches to studying culture that explore how organizations can use an ideal culture strategically to increase IS success. However, we identified a research gap on prescriptive culture management because we observed a lack of theories and empirical studies on this phenomenon. From our literature review, we derive two themes that are particularly suitable to stimulate research on the prescriptive management of culture in strategic IS contexts: 1) cultural clashes, which relate to cultural differences that serve as barriers to business, and 2) cultural identity, which relates to cultural commonalities that can serve as enablers to business. Apart from examining the two themes separately, we also outline their interdependence. We show that these two themes are relevant in the context of culture management and derive possible ways to include them in strategic IS research. Thus, we provide guidance for future studies and pave the way for strategic IS research toward prescriptive theorizing about culture management.

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