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# **The Implementation of Enterprise Resource Planning Systems in Different National and Organisational Cultures**

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## **Declaration**

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## Abstract

ERP (Enterprise Resource Planning) packages provide generic off-the-shelf business and software solutions to customers. However, these packages are implemented in companies with different organisational and national cultures, and there is growing evidence that failure to adapt ERP packages to fit these cultures leads to projects which are expensive and overdue. This thesis investigates this impact of national and organisational cultures on the efficiency of ERP implementations.

A theory of culture for ERP implementations is proposed. It draws on key theories and models of social and management science. The theory also includes a meta-schema of culture – a meta-model of the critical elements of national and organisational culture and ERP implementations. It provides the reader with a generic definition and model of culture. The theory was evaluated by two studies. The first study was conducted at the finance department of a higher educational establishment. The second study was conducted at 3 subsidiaries of a large multi-national pharmaceutical organisation in the UK, Germany and Scandinavia. Results provided evidence for the impact of organisational and national culture on the efficiency of ERP implementations. Furthermore, the results validated the theory of culture. They demonstrated that the culture-related problems arise because the changes associated with an ERP implementations, violated the employees' expectations (norms).

The thesis also presents a method called CAREs (Culturally Aware Realisation of ERP systems) that aims to help ERP implementation teams to identify, explain and predict potential culture-related problems. Three experts evaluated the CAREs method. They were presented with a series of SAP implementation scenarios and were asked with a number of questionnaires to provide feedback on its utility, usability and effectiveness. The results demonstrated that the method is potentially useful to ERP implementation teams. Moreover, the results provided suggestions on how to improve the CAREs method. The thesis concludes with a review of the research hypotheses and a discussion of future work and future directions.

# **Chapter 1**

## **Introduction: ERP Implementations in Different Organisational and National Cultures**

This chapter introduces the research problem and gives the outline of the thesis

# Chapter 1

## Introduction: ERP Implementations in Different Organisational and National Cultures

### 1.1 Introduction

ERP (Enterprise Resource Planning) software packages are an essential part of enterprise-wide information systems. An ERP package, such as SAP's R/3, is a large off-the-shelf software solution which provides integrated business and software systems to a customer. Unlike the traditional software development approach, which promotes building systems from scratch, ERP packages encapsulate reusable best business processes and software. Customers purchase the package and configure their business processes and software systems to meet their requirements. For the year 1999, the value of the ERP market was estimated at \$17 billion and is expected to grow to \$21 billion by 2004 (AMR Research, 2000). This is hardly surprising as organisations world-wide in the year 1999 spent between US\$90-180 billion on ERP packages (Shanks & Seddon, 2000).

ERP packages have important benefits to companies. These benefits can be classified into five categories (Shanks & Seddon, 2000):

- Operational benefits; for example reduced process costs, efficient productivity;
- Managerial benefits; for example improved decision making and planning;
- Strategic benefits; for example supporting business growth, building cost leadership;
- Information technology (IT) infrastructure benefits; for example information technology cost reduction;
- Organisational benefits; for example assist in organisational change and organisational learning.

However, the companies that implement an ERP package face a number of challenges. A Standish Group report on ERP implementation projects reveals that these projects were, on average, 178% over budget, took 2.5 times as long as intended and delivered only 30% of promised benefit (Densley, 1999). Adapting the implementation to the prevailing cultural style was generally one important cause of the projects' under-performance (Densley 1999).



This importance of culture is hardly surprising. Watson & Schneider (1999) assert that “*an ERP system is a generic term for an integrated enterprise computing system, a customised packaged software-based system that handles the majority of an enterprise’s information systems requirements*”. It is delivered with recommended best business processes and a software system that supports these processes, integrating all business functions into a single database, thus improving control and information flow (Sjaak, 1999). According to Gibson et al. (1999), “*from a software perspective an ERP system is complete, but from a business perspective, the software and the business processes need to be aligned which involves a mixture of business process redesign and software configuration*”. As a result, organisations that want to adjust their business processes to the ERP package’s best business processes have to go through major business process and system re-engineering, which can also be called “*culture change, that accounts for 60%*” of the implementation time (Gerber, 1999). Most ERP systems integrate different organisational parts, business processes and geographical sites into a single international architecture, though parts of that architecture can be configured to the needs of specific organisational parts or geographical site (Lehmann, 1998). An example of this is SAP’s R/3 multi-language support. As ERP implementations are part of a re-engineering project (Buxmann & Koenig 1996, Stein 1999), “*many multi-cultural issues may arise at many stages and in many parts of this large project*” (Gulla & Mollan, 1999).

According to Davenport (1998), there are many examples of ERP implementation project failures (e.g. Dow chemicals, Dell computers, Mobil, etc.). One of the cited reasons is the technical challenges that are involved in implementing such a highly complex and rigid piece of software. Installing and configuring ERPs require large investments of money, time and expertise. However, the biggest problem is not the technical challenges, but the business problems associated with an ERP implementation (Davenport 1998, Schneider 1999, Caldas & Thomaz 1998). “*Its not about the technology, its about reinventing your business*” (Schneider, 1999) because ERPs are so intertwined with business processes, organisational structures and even business strategies. “*ERP implementations involve, in truth, broad organisational transformation processes, with significant implications on the organisation’s management model, organisation structure, management style and culture, and particularly, on people*” (Caldas & Thomaz, 1998). Companies implementing an ERP have realised that it means substantial business process re-engineering, near complete organisational restructuring, re-evaluation of business strategies and major cultural-change (Davenport 1998, Caldas & Thomaz 1998, Schneider 1999, Gerber 1999). Overall, ERP implementations can give rise to enormous benefits for successful organisations and conversely, can be extremely disastrous for companies that fail to manage the implementation process (Holland et al.1999).

*“Awareness of cultural differences and preferences will certainly improve the assessment of ERP suitability and any subsequent implementation” (Davison, 2002).*

To summarise, ERP implementation projects often fail to recognise and understand the importance of culture. Companies implementing ERP systems will continue to face difficulties such as these reported if the impact of organisational and national culture is not taken into account. In the next section, I describe how research in the area of ERP implementations fails to recognise or take up those cultural challenges.

## **1.2 Research in the area of ERP implementations**

Research into ERP systems implementations has reported the failures to deliver projects on time and within budget. To tackle those challenges ERP implementation methodologies have been strengthened and the importance of several Critical Success Factors (CSF) has been emphasised. However, these improvements do not recognise the importance of culture on ERP implementation projects.

There is a plethora of implementation approaches (e.g. SAP’s ValueSAP, PwC’s Ascendant). However, all focus on technical and organisational and overlook national culture-related issues. Some research (Davison 2002, Densley 1999, Lehmann 1998 etc.) has been reported on the influence of organisational culture on the success of the ERP implementations, and some of the implementation approaches elicit information about organisational culture. Nevertheless, these approaches are not strong and holistic enough to handle culture-related issues because of the following reasons:

- They elicit information about organisational culture but not the national culture of the company that implements the ERP package.
- They elicit information about the organisational culture without any indication or prediction of culture-related issues that many arise as a result of such an implementation in this specific organisational culture.

In short, most current ERP implementation methodologies do not elicit evidence of relevant national and organisational cultures in a systematic manner.

In the following section, I explain how research into culture has failed to realise the impact of culture in ERP implementations.

### **1.3 Research in the area of national and organisational culture**

Current research into national and organisational culture originates mainly from the psychology, management, sociology, organisational theory and human resources management disciplines. Most of the research focuses on what culture is, how it can be identified, and how someone can separate one culture from another. Although there is a wide variety of views and approaches, not all of them are relevant to ERP implementations and not all deal with culture-related issues.

For example, “organisational culture is the way in which attitudes are expressed within a specific organisation” (Trompenaars, 1994) is just one of numerous definitions of organisational culture that is difficult to apply to ERP implementations as it is. As with the definitions of culture, there are many culture elicitation approaches available. These approaches have potentially a lot to offer to the research in ERP implementations.

However, research results available from disciplines including sociology and management science provide enormous opportunities to help us understand the culture-related issues arising in ERP implementations. For example, the scholars in the area of culture (Trompenaars 1994, Hofstede 1994, Schein 1985) have developed methods for eliciting evidence of culture. These methods can provide a significant insight into the culture of a company that is implementing an ERP. Moreover, these scholars among others have also identified the elements that comprise a culture (for example values, beliefs, norms, rituals, heroes etc.) and their inter-relationships. These elements can be modelled and related to some ERP implementation aspects, in order to illustrate the connection and influence culture has in such implementations. In addition, research into culture offers dimensions that can be applied to distinguish one culture from another.

It can thus be argued that current research into the area of culture does not attempt to tackle culture-related issues in ERP implementation due to the lack of overlapping discipline interests. However, there is enormous potential in exploiting this research and relating it to ERP implementations.



## **1.4 Thesis objective, scope and hypotheses**

In this section, I discuss the objectives and scope of the thesis, as well as the research hypotheses and tests.

### **1.4.1 The objective of the thesis**

The main objective of the thesis is to develop a method that can aid a project team to recognise and predict possible culture-related problems that arise during ERP implementations

### **1.4.2 The scope of the thesis**

The thesis addresses the problem of the culture-related issues arising when implementing an ERP system in different national and organisational cultures. The thesis focuses on two kinds of culture, namely national and organisational. Other forms of culture (e.g. occupational/professional) are not covered in this reported research. Furthermore, aspects of social science, such as personality of the employees who work in the organisation implementing the ERP package, will not be examined. Likewise, the effect and influence of the leader of the company that is implementing an ERP, as well as other leadership issues, will not be explored.

### **1.4.3 The hypotheses investigated in the thesis**

In this section, I present the five hypotheses that were investigated in this thesis. Because of the multi-disciplinary nature of this research, all five hypotheses were tested using qualitative analyses. For each of the five research hypotheses, I have set a number of sub-objectives. These represent the work to be done, to test each of the hypotheses.

#### **1.4.3.1 Hypothesis one (H1)**

The first hypothesis investigated in this thesis was:

**H1** Organisational and national cultures have a critical impact on the efficiency of ERP implementations



I define as impact in this context, the negative effect or impetus an element of culture might have on the efficiency of an ERP implementation, which could give rise to culture-related problems. These culture-related problems, are as critical for the efficiency of ERP implementations, as other types of problems customer organisations face.

The sub-objectives that enabled me to test this first hypothesis were:

1. To conduct empirical studies that will elicit problems that customer organisations encounter when implementing an ERP package.
2. To investigate whether some of those problems occur as a result of the national and organisational culture of the customer organisations.
3. To examine whether these culture-related problems are as critical as other types of ERP implementation problems.

#### 1.4.3.2 Hypothesis two (H2)

The second hypothesis investigated in this thesis was:

**H2** Social and management science theories and models can be integrated and progressed to develop a descriptive model (meta-schema) of some of the key elements of national and organisational culture that are critical to ERP implementations

The sub-objectives of this hypothesis were:

1. To develop models (instantiations) of the descriptive model (meta-schema).
2. To investigate whether these models (instantiations) have descriptive properties of some of the key elements of culture, critical to ERP implementations.

#### 1.4.3.3 Hypothesis three (H3)

The third hypothesis investigated in this thesis was:

**H3** Social and management science theories can be extended to produce models that accurately describe the culture-related problems observed in current ERP implementations

The two sub-objectives for this hypothesis were:

1. To develop models (instantiations) of the descriptive model (meta-schema) for the observed culture-related problems, based on the interview data.
2. To investigate whether these models (instantiations) can accurately represent the culture-related problems observed.

#### 1.4.3.4 Hypothesis four (H4)

The fourth hypothesis investigated in this thesis was:

**H4** Social and management science theories can be extended to produce models that can be applied to explain the reasons behind the culture-related problems arising from ERP implementations

In this context, the models explain a culture-related problem when the elements they incorporate can be used to describe the reasons for the existence of those problems.

The two sub-objectives of this hypothesis were:

1. To develop models (instantiations) of the descriptive model (meta-schema) for the observed culture-related problems, based on the interview data.
2. To investigate whether these models (instantiations) can offer the reasons for the existence of those culture-related problems.

#### 1.4.3.5 Hypothesis five (H5)

The fifth and final hypothesis investigated in this thesis was:

**H5** The CAREs method can provide utility in ERP implementation projects to identify, explain and predict culture-related implementation problems.

The level of utility defines the usefulness that the 3 components of the CAREs method can provide to ERP implementation teams in identifying, explaining and predicting culture-related implementation problems.

The objectives of this hypothesis were:

1. To conduct evaluation studies in order to determine the level of usability, utility and effectiveness of each of the 3 components of CAREs.
2. To supply enough evidence to suggest that the method can provide utility in ERP implementations projects to identify, explain and predict culture-related implementation problems.

## 1.5 Thesis outline

This thesis consists of eight chapters, as illustrated in figure 1.1. The next chapter presents the literature review of the existing research on ERP systems and culture. It examines what ERP systems are and why they are so popular. Additionally, it discusses the lack of culture-related approaches for ERP systems implementation. Furthermore, it reviews relevant management and social science work on culture. It discusses what culture is and the different approaches of the scholars in the area of culture.

Chapter three describes the theoretical work undertaken to investigate hypotheses H2, H3, and H4. It describes a theory of culture for ERP implementations that integrates and extends existing theories and models of culture tailored for ERP implementations. It introduces a descriptive model comprised of the key elements of culture and ERP implementations. This model can be instantiated to model culture-related problems.

Chapter four describes a preliminary study of an ERP implementation carried out to test part of the theoretical work developed in chapter three to investigate hypotheses H1 and H2. Interviews were conducted and the resulting data was then analysed to test the relevant hypotheses. The study also provided insights about the data gathering and analysis method applied.

Chapter five describes studies carried out to evaluate the theoretical work presented in chapter 3 and test hypotheses H1, H2, H3, and H4. The studies were carried out in three national subsidiaries of a large multinational organisation in three countries.



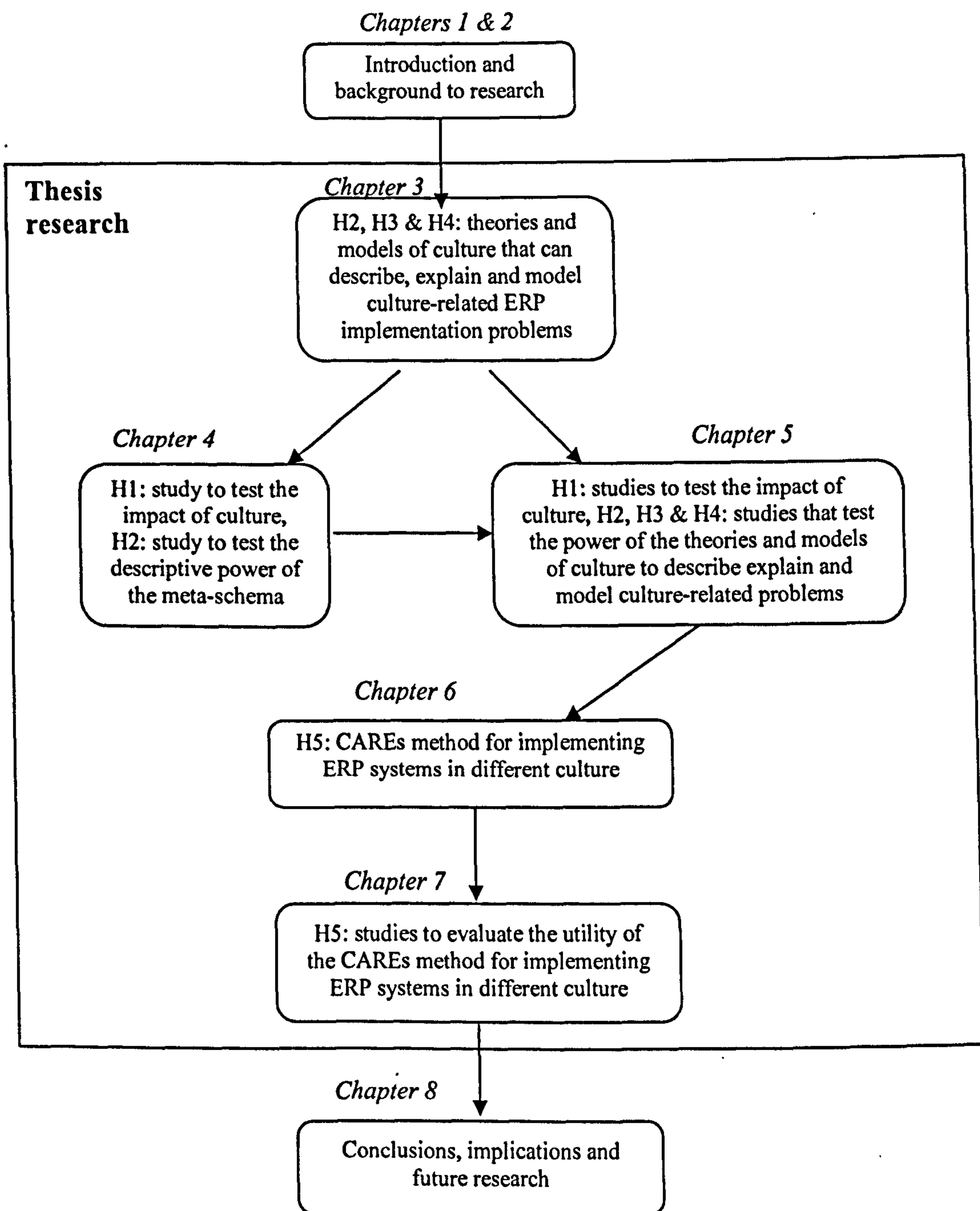


Fig. 1.1: the structure and relationships between the thesis chapters. (The arrows denote how a predecessor chapter contributes to its successor).

Chapter six presents the CAREs method for implementing ERP systems in different national and organisational cultures. The chapter discusses the rationale and provides a description and a detailed “how-to-do-it” outline of the CAREs method.

Chapter seven describes the empirical work carried out to test hypotheses H5. It presents the method applied to test the effectiveness, usefulness and usability of the CAREs method and reports the results of the evaluation.

Finally, chapter eight summarises this research, re-examines the five research hypotheses and concludes with a discussion of implications and possible future directions.

## **1.6 Contributions**

The research reported in this thesis has implications for research in ERP implementations and in the field of interdisciplinary research.

Contributions for ERP implementations:

- A method is proposed for eliciting elements of organisational and national culture that are critical to ERP implementations;
- A set of cultural predictions that can be applied to advise implementation teams of the possible issues that may arise when implementing ERP systems in different national cultures;
- A model of key ERP concepts that embodies also key national and organisational elements of culture and their associations;
- A synthesised model indicating the implicitness of the key concepts of ERP implementations and of national and organisational culture;
- A technique for modelling culture-related issues in ERP implementations.

Contributions for interdisciplinary research:

- This thesis brings together research from the fields of social and management science, organisational theory, human resources management, and computer science. It demonstrates that such work can be beneficial to the software engineering discipline.

## Chapter 2

### Current State-of-the-art Research into ERP Solutions and Culture

This chapter provides background knowledge for the thesis and details relevant research

## **Chapter 2**

# **Current State-of-the-art Research into ERP Solutions and Culture**

### **2.1 Introduction**

This chapter presents the state-of-the-art computer science and software engineering research into ERP systems and social and management science research in organisational and national culture. Firstly, the problem area of this thesis is introduced. Secondly, existing research on ERP systems is presented and the lack of culture-related approaches for ERP systems implementation is discussed. Finally, this chapter reviews current research in national and organisational culture and why it is not applicable for ERP implementations.

### **2.2 An introduction to the impact of culture in ERP implementation**

ERP software packages are an essential part of enterprise-wide information systems. An ERP package is a large off-the-shelf software solution that provides integrated business and software systems to a customer. The 1999 market for ERP software was estimated at \$17 billion and is expected to grow to \$21 billion by 2004 (AMR Research, 2000). ERP systems have also been extended to include World Wide Web capabilities, customer relationship management (CRM) and support for electronic market-places, the sales of which are predicted by 2004 to be equal to that of the ERP software at \$20 billion (AMR Research, 2000).

However, research also shows that there has been a decrease in the market share. There are two reasons for this. Firstly, there is a view that the ERP market slowdown is attributable to 3 factors (Jakovljevic, 2001). The first factor is that the 1997 high market value that has come from the Fortune 1000 multinational corporations implementing ERPs has now been stalled (Jakovljevic, 2001). Another reason is that SMEs (Small-to-Medium Enterprises) have been cautious about implementing ERPs because of the reported problems and unsuccessful implementations. The third reason is the uncertainty in investing in client/server technologies due to the paradigm shift to the Internet (Jakovljevic, 2001).



Another view is that the perceived loss of ERP popularity is due to a change in naming conventions, for example to supply chain management systems (Guthrie, 2001). Whatever the reason, it remains a fact that the ERP market value has fallen and ERP vendors have to resolve functional and technological problems, expand their sales and, last but not least, harness the Internet (Jakovljevic, 2001). A Standish Group report on ERP implementation projects reveals that these projects were, on average, 178% over budget, took 2.5 times as long as intended and delivered only 30% of promised benefit (Densley, 1999). The most notable was Dell who spent in excess of \$200 million over 2 years and still cancelled their ERP project (Buckhout, 1999).

More specifically, a survey of 12 recent projects revealed that adapting the implementation to the prevailing cultural style was generally one important cause of the projects' under-performance (Densley 1999). A basic premise of this thesis is that if more ERP implementations are to deliver their promised benefits within budget, and if ERP vendors are to regain their lost market share, we need to understand how organisational and national culture impact on ERP implementations, and how this understanding will deliver better software solutions and methods for ERP vendors, implementation partners and customers to use.

### 2.3 The shift from traditional systems to ERP

A paradigm shift from traditional, custom-built systems development to package-based systems development has taken place over the last 10 years (Dean et al, 1997, Price Waterhouse, 1996). The development of traditional systems was designed to meet the needs of businesses at a given point in time, and not to adapt and operate in dynamic environments (Paul, 1993). This happens as they are built to the exact specifications for '*one hypothetical point in time*', whereas they are expected to work over a '*time continuum*'. Paul (1993) argues that '*what is required for living businesses, however, are living systems*', systems that can change as the businesses change, otherwise it is guaranteed that problems and user disappointments 'will arise. The entire systems development process – *requirements acquisition, design, implementation, maintenance* – is very different for package-based systems development (Ncube 2000). In the traditional systems development process, the requirements are defined in the beginning, whereas in the package-based process they are defined as the system is being developed.



Holland et al. (1999) argue that *“the primary reason for this shift was the need to deal with legacy systems”*. *“Many existing systems have become so difficult and costly to maintain, inflexible and misaligned with business strategy that firms have taken a clean slate approach towards their IT strategy”* (Holland et al. 1999). There are two primary reasons for this. First of all, as companies, markets and industries have become more global, they are forced to adopt global business and IT strategies. *“Only five years ago software was usually purchased and implemented locally, but now as companies are having to manage international operations, international systems and strategies are the imperatives”* (Newing (1998) in Holland et al. 1999). However, the existing systems within companies could not support this need and therefore created misalignment (Holland et al. 1999). The second reason for this shift was the Year 2000 problem. Many of the existing systems were not compliant and it would have been very difficult to make them compliant. According to Holland et al. (1999), the combination of these 2 reasons made companies seek alternative solutions.

Every company needs to try to change and adapt to today’s dynamic environment, and one way of doing this is to manage information effectively. This is a major source of competitive advantage (Caldas & Wood, 1998). A powerful, integrated and open information technology infrastructure is needed to support the business and to respond quickly to change (Welti, 1999). For this reason, throughout the 1990s, organisations increasingly chose to purchase ERP packages and shift away from the bespoke systems (Price Waterhouse, 1996). This shift changed the focus of effort from traditional systems design to software configuration and business process change (Holland et al. 1999). *“ERP implementations involve broad organisational transformation processes with significant implications on the organisation’s management model, organisational structure, management style and culture and particularly people”* (Caldas & Wood, 1998). ERPs are the most successful use of component-based development, and the only ones that have an impact at the enterprise level where the organisation’s culture is significantly affected. This is where the research of this thesis focuses.

## **2.4 Enterprise Resource Planning (ERP) systems**

The following sections describe what ERP systems are, how they evolved, the main reasons that companies name for their implementation and the main vendors and their products. It also presents cited critical success factors for the ERP implementation.

### 2.4.1 What are ERPs and how did they evolve?

ERP systems are sometimes referred to as enterprise-wide software and can be defined as *“comprehensive packaged software solutions that integrate organisational processes through shared information and data flows”* (Shanks et al. 2000).

ERPs are modular application software that *“help manufacturers increase the productivity of such mission-critical components of their business as human resources, finance, parts purchasing, inventory control, supply chain, and customer relationship management”* ([www.erpsupersite.com](http://www.erpsupersite.com)).

An ERP system is designed to integrate all departments and functions across a company into a single computer system that can help them share information and communicate more easily. According to Deloitte Consulting (Deloitte Consulting Research Report, 1999) an ERP solution facilitates *‘the efficient and effective use of a company’s resources (materials, people, plant, equipment, etc.)’* and it increases the company’s ability to:

- Automate and integrate the organisation’s main business processes;
- Share common data and practices across the entire organisation since they run off a single database;
- Produce and access information in a real-time environment.

Watson & Schneider (1999) assert that *“an ERP system is a generic term for an integrated enterprise computing system, a customised packaged software-based system that handles the majority of an enterprise’s information systems requirements”*. It is delivered with recommended best business processes and a software system that supports these processes, integrating all business functions into a single database improving control and information flow (Sjaak, 1999). According to Gibson et al. (1999) *“from a software perspective an ERP system is complete, but from a business perspective, the software and the business processes need to be aligned which involves a mixture of business process redesign and software configuration”*. As a result, organisations that want to adjust their business processes to the ERP’s best business processes have to go through major business process and system re-engineering, which can also be called *‘culture change, that accounts for 60%’* of the implementation time (Gerber, 1999). Additionally, most ERP systems integrate different organisational parts, business processes and geographical sites into a single international architecture, though parts of that architecture can be configured to the needs of specific organisational parts or geographical sites (Lehmann, 1998). As a result, according to Gulla &



Mollan, 1999 “*many multi-cultural issues may arise at many stages and in many parts of this large project*”.

According to Deloitte Consulting (Deloitte Consulting Research Report, 1999), “*ERPs are actually just the latest generation of a continuing evolution of business systems whose origins date back to the 50s*”. They started off with inventory control systems in the 1950’s, developed into Material Requirements Planning (MRP) and then to MRP II (1960-1980) and finally extended in the 1990 into ERPs by including other applications, for example human and capital resource. This development resulted in a software and business solution that integrates all the key business functions of an organisation, and is deemed to be ‘*a catalyst for radical business change*’ (Watson & Schneider, 1999).

MRPs were based on mainframe computers that were often the technological backbone for the entire organisation, but had drawbacks including graphic support and competing between applications and users for centralised resources (Curran & Ladd, 1999). Overall, mainframes were difficult to manage and expensive to maintain. Developments of new types of business processes made work more complex, and the need to access information throughout the company increased. The new business environment required IT solutions that were more effective than the conventional mainframes. Thus, in the 1980s, many companies began to look for substitutes for their mainframes, encouraged by rapid technology developments and the dropping price of computing (Curran & Ladd, 1999). One important contributor to the developments in IT was the introduction of client-server technology. The foundation of client-server technology is: “*Desktop systems at the workplace of the end-users are connected via local area networks to dedicated background systems that are employed as file-servers, print servers, etc*” (Curran & Ladd, 1999). Client-server technology offers a wide range of benefits such as enabling the users to focus on their tasks without knowing the systems’ technical structure, flexibility in the hardware choice and increased possibilities to expand the business globally (Curran et al. 1999). The introduction of client-server technology resulted in MRP systems being developed into ERP systems, which in the 1990s had become the technological backbone of choice, and companies were focused on using ERPs to realise and sustain competitive advantage (Deloitte Consulting, 1999).

#### 2.4.2 An example of an ERP system

According to Davenport (1998b), in order to understand an ERP system and its capabilities, it is worth giving an example of an *ideal* ERP system implementation and what an ERP system



can do for a company in an *ideal* situation. The following example is based on the work of Dahlén & Elfsson (1999).

A U.S. car manufacturer uses an ERP system across all its subsidiaries. A Madrid-based sales representative prepares a pricing quote for a client. The salesperson enters his client's information into his computer, and automatically the ERP system produces a standard offer, in Spanish, with the client's chosen car model, price information and expected delivery date. When the client accepts the offer the ERP system records it. The system then schedules the shipment of the car, identifies the best routing and, by working backwards from the delivery date, it reserves the necessary materials from the inventory. It also orders necessary parts from suppliers and schedules assembly in the company's factory in South America. The sales and production forecasts are automatically updated and a bill of materials is created. The sales representative's payroll account is credited with the respective commission in his local currency. The actual product cost and profitability are calculated in US dollars, and the divisional and corporate balance sheets, the accounts-payable and accounts-receivable ledgers, the cost-centre accounts, and the corporate cash levels are all automatically updated. In effect, the system performs nearly every information transaction resulting from that sale.

### 2.4.3 The main ERP vendors

ERP systems were one of the fastest growing segments of the software markets (Stevens, 1997). There are several vendors that have entered the ERP market. Some of them offer a complete enterprise solution and others focus on niche markets by offering an industry-specific solution. The ERP market share estimation for 2001 is shown in figure 2.1 below (Jakovljevic, 2001):

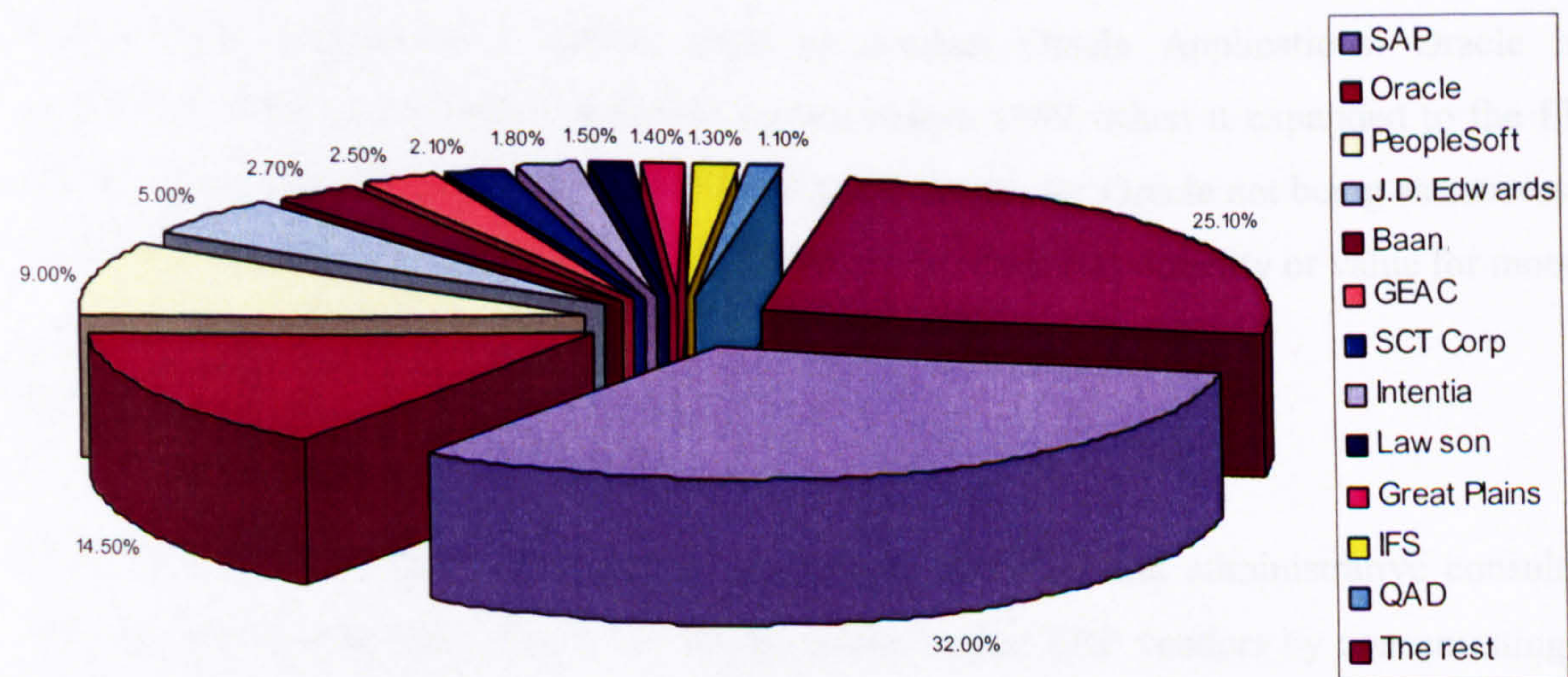


Fig. 2.1: Estimated ERP Market Share in 2001 (Jakovljevic, 2001, part 2, p.1)



As seen from figure 2.1 above, the top five main ERP vendors are SAP, Oracle, PeopleSoft, J. D. Edwards and Baan as estimated for 2001, and are briefly introduced below.

#### 2.4.3.1 SAP (Systems Applications and Products in Data Processing)

SAP is a German company and is the world's leading vendor of ERP packages. Its current back-office system, the R/3, has advanced functionality in terms of handling multiple companies and multiple currencies, and is therefore chosen by the world's biggest international companies (e.g. Microsoft, Procter & Gamble). The system is written in the ABAP/4 language and is built in 12 different modules including sales & distribution, warehouse, finance and production planning. SAP claims that it is a company committed to its product development and therefore SAP invests a substantial amount of money in R&D (research & development). This and the fact that SAP was the first company to enter the ERP market are two of the main reasons for its success.

However, on the other hand, the company also faces problems. One problem is that most of the big, multinational companies that need an ERP system have already implemented one. SAP has to develop cheaper and less complex solutions to target medium and small sized companies (Somers & Nelson, 2001). Another problem that SAP faces is the complexity and therefore lengthiness of the implementation of its products. SAP's implementation partners have developed methodologies trying to reduce the complexity and the time span of the implementation projects (Somers & Nelson, 2001).

#### 2.4.3.2 Oracle

SAP's main competitor is Oracle, with its product Oracle Applications. Oracle had established itself as the largest database vendor before 1989, when it expanded to the ERP market. According to Somers & Nelson (2001), one reason for Oracle not being as successful is because the company has prioritised marketing rather than functionality or value for money.

#### 2.4.3.3 Baan

Baan is a Dutch company that started by offering financial and administrative consulting services. It has established itself now as one of the largest ERP vendors by concentrating on manufacturing and logistic systems. Baan has acquired several software companies, which on the one hand reduced its time to market but on the other necessitated the development of

interfaces and integration between the Baan solution and the acquired software (Somers & Nelson, 2001). This resulted in low financial returns and an essential lay off of many employees. Currently, with 15 externally developed products to be integrated with the *'home-grown core'* the company is exposed to many unforeseen problems (Somers & Nelson, 2001). *"Nevertheless, Baan believes that the brand names and client lists that can with the acquisitions outweigh the problems"* (Somers & Nelson, 2001).

#### 2.4.3.4 PeopleSoft

PeopleSoft started by concentrating in the area of Human Resources, which is still the company's strength (Somers & Nelson, 2001). Some critics argue that the company is not a complete ERP vendor. However, according to Somers & Nelson (2001), the company has advanced modules in manufacturing, distribution and financials. PeopleSoft's sales mainly derive from the US and, again according to Somers & Nelson (2001), only 20% of its sales come from clients outside of the USA, which is a small percentage compared to its competitors. However, its share in the European market is growing. Furthermore, PeopleSoft is successfully targeting small to medium sized companies with its product PeopleSoft Select, a packaged solution that simplifies the implementation process.

#### 2.4.3.5 JD Edwards

JD Edwards is a US-based company that started off as a software developer and became the fifth largest ERP vendor by providing financial, logistics and manufacturing packages. According to Somers & Nelson (2001), the company realised that if they did not grow faster than SAP and PeopleSoft, they will be pushed out of the market. Therefore, after developing its products for 3 years, JD Edwards now sells its products under a new brand name, OneWorld. The company believes it will grow much more quickly, especially because of the boost in sales of OneWorld with the emphasis of electronic commerce in the market (Somers & Nelson, 2001).

### **2.5 Why companies implement ERP systems**

Implementing ERPs is an enormous undertaking that involves considerable expense, years of planning and fundamental changes within an organisation with no guarantee of success. Thus, companies must have good reasons to implement an ERP. In this section I present reasons



reported by companies for implementing their ERP systems. According to Deloitte Consulting (Deloitte Consulting Research Report, 1999), companies choose to implement ERP systems for two reasons; technological and operational drawbacks. Figure 2.2 shows the frequency of various respondents to the technological reasons of why implement an ERP (Deloitte Consulting, Research Report, 1999).

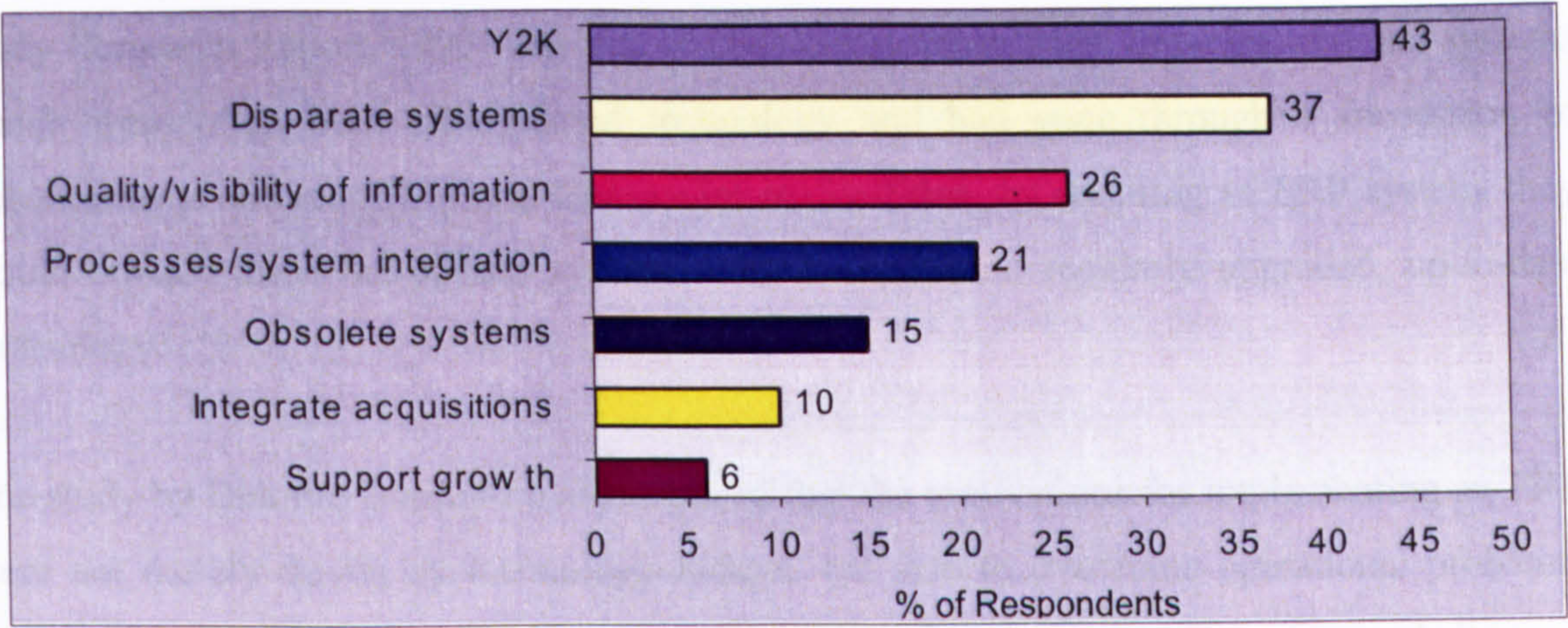


Fig. 2.2: Technology Program Motivations (Deloitte Consulting Research Report, 1999). Answers do not add up to a 1000% because respondents could give more than one response.

During 1999, when Deloitte Consulting conducted this study, the most important motivator for ERP implementations was to overcome Year 2000-related issues (Deloitte Consulting Research Report, 1999). ERP systems, such as SAP’s R/3, are Year 2000 compliant and companies knew that they would avoid problems like date-handling incompatibilities when deciding to implement them (Seekely, 2001).

The second most important motivators were the problems associated with disparate legacy systems. With ERP systems this problem is overcome as they are built on one underlying database that contains all the data used in the organisation. The unification of data under one technology platform “leads to improved quality and visibility of information and more streamlined, consistent and effective business processes” (Deloitte Consulting, Research Report, 1999). One set of data also results in better access of information by the employees and therefore in more informed management decisions. Even employees of the same company but in different countries have the possibility to share and access one data set.

Another factor that contributed to the choice of an ERP system is that an ERP enables the company to integrate its business processes and systems. An ERP system comes with recommended best-practice business processes and a software system to support these



processes, so that it integrates all the business functions into one system and improves control of the processes. This is echoed by Curran & Ladd (1998) who state that “*this system [SAP’s R/3] allows the business engineer to explore every pathway where value is added within the company and to design business processes that maximise value while minimising cost*”.

Another motivation for implementing an ERP system reported in the Deloitte Consulting study (Research Report, 1999) was that of obsolete systems. Most organisations had systems which were often built on outdated technology and had gone through a succession of enhancements and modifications. Companies realised that, by adopting an ERP system, they would replace these out-of-date systems with a consistent, regularly upgraded, up-to-date technology.

The study by Deloitte Consulting also showed that the motivations for implementing an ERP were not merely driven by technology factors, but also to overcome operational problems (Deloitte Consulting, Research Report, 1999). There are fundamental business challenges, including poor or uncompetitive performance and ineffective business processes, that the companies at the time of the study were trying to solve. For the first time, organisations looked to technology to solve these challenges (Deloitte Consulting, Research Report, 1999).

Figure 2.3 below shows the frequency of various responses to the operational problems that had to be overcome (Deloitte Consulting, Research Report, 1999).

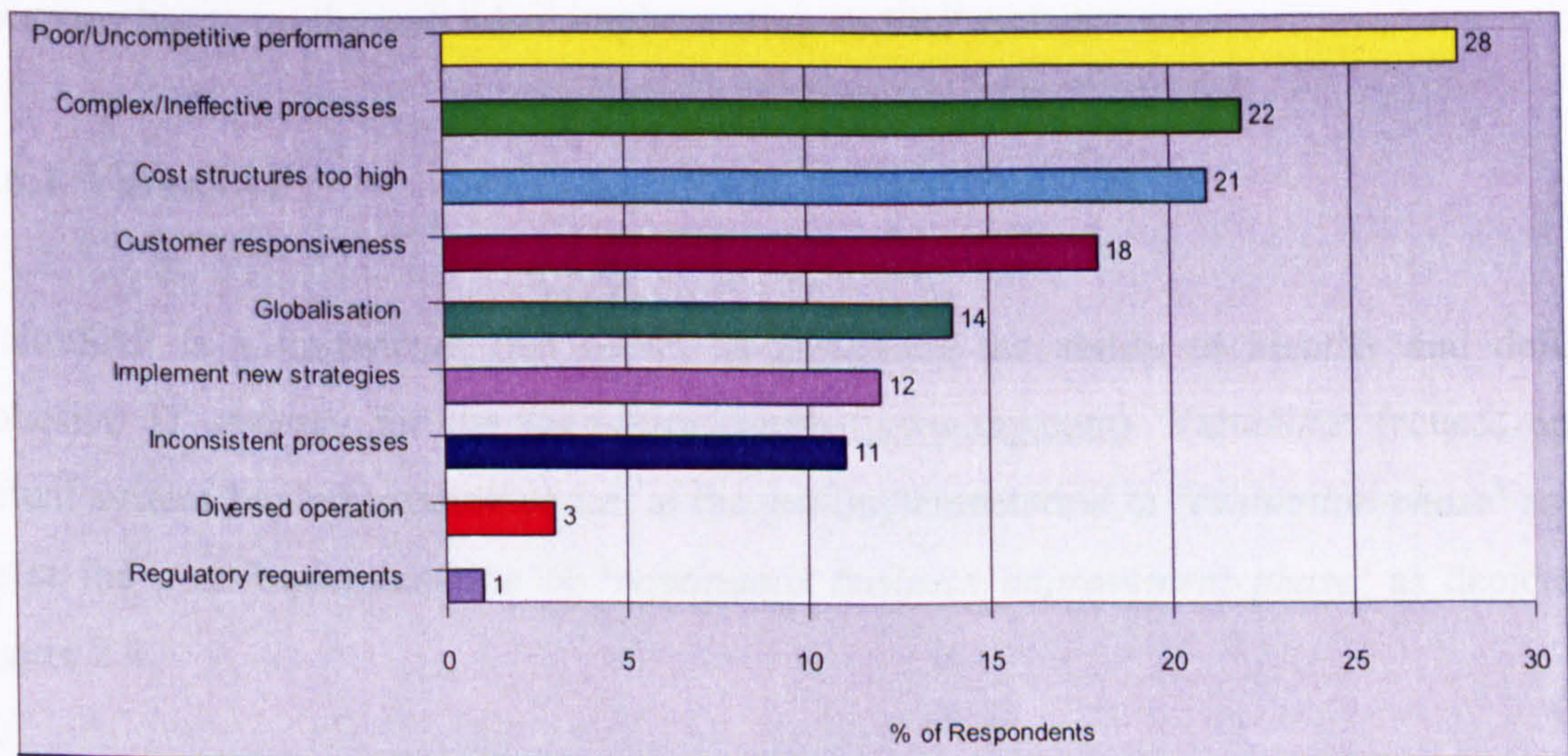


Fig. 2.3: Technology Program Motivations (Deloitte Consulting Research Report, 1999).  
Answers to not add up to 100% because respondents could give more than one answers



According to the report (Deloitte Consulting, 1999), the most significant operational motivator for implementing an ERP system was to overcome uncompetitive and poor performance. Improved information quality and visibility, faster and less costly business processes leads to greater effectiveness, efficiency and better performance levels (Deloitte Consulting, Research Report, 1999). In the report it is argued that *“improvements in the efficiency and effectiveness can lead to transformation – the ability to fundamentally change the way the company operates”*. *“This change might include the rapid development of new products and responding to market demands, expanding markets or improving the relationship to the suppliers”* (Deloitte Consulting, Research Report, 1999). Other reasons include complex and ineffective business processes and the need for the business to become global. Both these operational challenges can be met when implementing an ERP as they encapsulate best business processes that companies can configure to their requirements as well as the ability to share information throughout an organisation both locally and globally (Deloitte Consulting, Research Report, 1999).

## 2.6 Implementing an ERP

There are numerous implementation approaches (e.g. SAP's ValueSAP, PwC's Ascendant, etc). However, all of them involve more or less the same challenges and problems. In this section, I discuss the process of implementing SAP based on SAP's suggested implementation approach, namely ValueSAP. The aim is to demonstrate the procedure a company has to go through when implementing an ERP system.

### 2.6.1 ValueSAP

ValueSAP is a framework that offers its customers the ability to identify and define a cohesive IT strategy for the long-term future ([www.sap.com](http://www.sap.com)). ValueSAP focuses on the actual system implementation phase, at the pre-implementation or *'evaluation phase'* as well as at the post-implementation or *'continuous business improvement phase'* as depicted in figure 2.4.

Within the ValueSAP life cycle, each phase includes the aim to be achieved and the attributes involved, which are briefly introduced in this section of the chapter ([www.sap.com](http://www.sap.com)).





Fig. 2.4: ValueSAP Life Cycle (as adapted by [www.sap.com](http://www.sap.com) )

#### 2.6.1.1 Discovery

In this phase the aim is to identify the best way that a SAP solution can support a business. A solution that is specific to a company's industry, one that is tuned to best-in-class business performance and one that will deliver real value to the company, now and in the future.

#### 2.6.1.2 Evaluation

The aim of this phase is to define and map out the mix of SAP software, technology and services required for a company's business enterprise solution. The goal is to achieve a clear return on investment, lowest cost of ownership and real value from the SAP Solution.

#### 2.6.1.3 Implementation

With careful planning and scoping of the company's implementation strategy, and by using SAP's methodologies, tools, and road maps, a company can start on the actual implementation of the system. The aim of this stage is to simply implement the SAP system.

#### 2.6.1.4 Operations & Continuous Improvement

The aim of this phase is to manage all stages of an implementation through to the on-going performance of a company's enterprise solution. Performance measurement and review, end-user training and knowledge management together with a broad range of SAP customer



service and support all help to try and deliver a stable, high value SAP solution. In addition, because business never stands still, ValueSAP can help a company continue to adopt the best business practice and improve its enterprise system. By using industry benchmarks, a framework for performance tuning and business improvement helps a company optimise its investment in SAP. ValueSAP Continuous Business Improvement Services help a company evaluate its current position, revisit its original business objectives and identify and exploit new business opportunities.

### 2.6.2 The ASAP roadmap

ASAP stands for Accelerated SAP. ASAP streamlines and standardises the implementation process of SAP solutions. It is one of the methodologies of ValueSAP, which supports not just the implementation phase but the whole process. In this section, I describe ASAP in more detail, as it is SAP’s implementation methodology that sets a company on the road to an ERP. ASAP is supported by a roadmap, as shown in figure 2.5 below, which helps a company learn what it needs to do and what has to be tested, step by step.

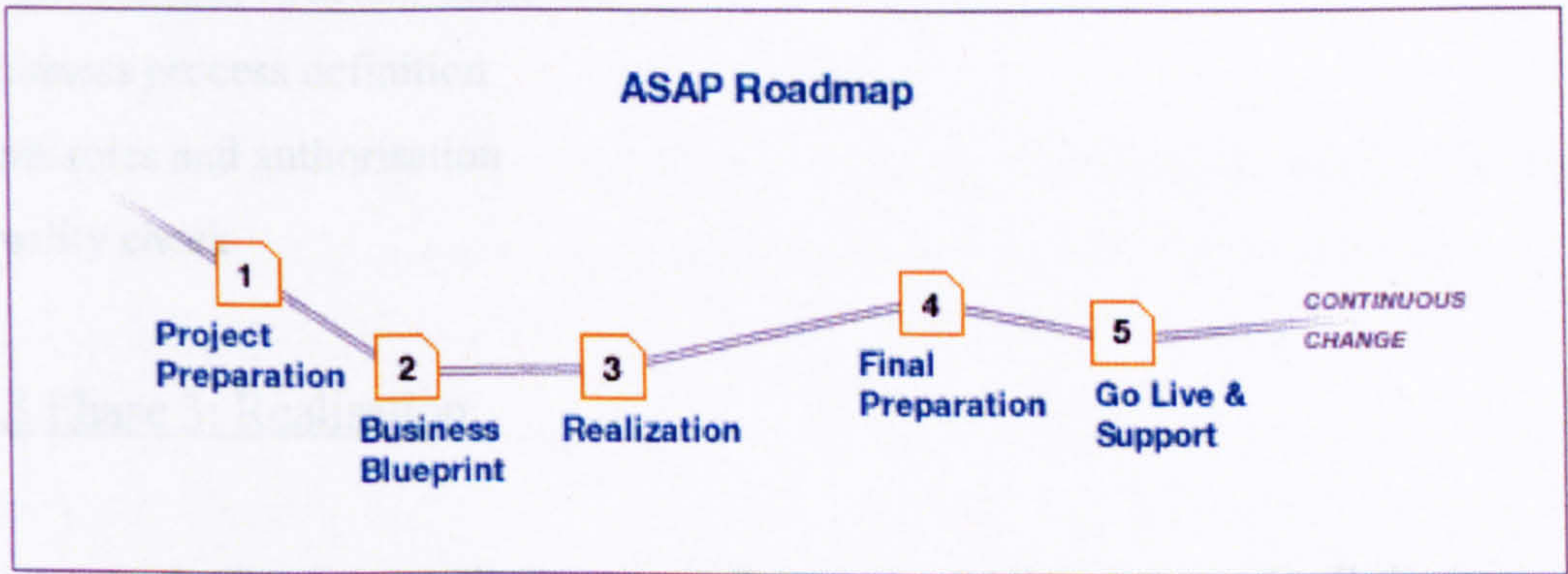


Fig. 2.5: ASAP Roadmap (as adapted from [www.sap.com](http://www.sap.com) )

#### 2.6.2.1 Phase 1: Project Preparation

Phase 1 provides the initial planning and preparation for an R/3 project. It consists of the following work packages:

- Initial project planning
- Project procedures



- Training
- Project kick-off
- Technical requirements
- Quality check

#### 2.6.2.2 Phase 2: Business Blueprint

According to SAP once a company is prepared for implementation, its business requirements resulting from the requirements workshops must be documented. The business blueprint is a visual model of a business, which serves to document the business process requirements of a company. It helps the project team to clearly define the scope of the implementation and to focus on the way the company wants to run its business with the R/3 system. Phase 2 includes the following work packages:

- Project management
- Organisational change management
- Develop system environment
- Training
- Organisational structure definition
- Business process definition
- User roles and authorisation
- Quality check

#### 2.6.2.3 Phase 3: Realisation

In this phase the implementation team configures the SAP system to fit all the business and process requirements as defined in the business blueprint. This phase is comprised of the following work packages:

- Project management
- Organisational change management
- Training
- Baseline configuration and confirmation
- System management
- Final configuration and confirmation
- Develop programs, interfaces, etc.

- Final integration test
- Quality check

#### 2.6.2.4 Phase 4: Final Preparation

Phase 4 is the time for the final testing and adjustments. It is the phase to complete testing, user training, system management and cutover activities to finalise a company's readiness to go live. Furthermore, according to SAP the final preparation phase serves to resolve all critical open issues so that upon successful completion of this phase, a company will be ready to run its business live on R/3. Phase 4 comprises of the following work packages:

- Project management
- Training
- System management
- Detailed project planning
- Cutover
- Quality check

#### 2.6.2.5 Phase 5: Go live & support

This is the final phase of the ASAP roadmap and it is the phase when all the final preparations have been made for the company to be ready to go live on R/3. The final phase includes the following work packages:

- Producing support
- Ongoing KPI (Key Performance Indicators) management
- Project end

The implementation process of an ERP project is a very complex one, and although there are important motives to initiate it and sustain it, there is evidence to suggest a risk of running over-time and over-budget (Parr 1999, Shanks & Seddon 2000, Buckhout, 1999, Densley 1999). Research on ERP implementations has resulted in a list of Critical Success Factors (CSFs) that aim to ensure a successful ERP implementation and to explain different implementation project outcomes (Holland 1999, Shanks et al 2000, Somers & Nelson 2001). These are discussed in the next section.



## **2.7 Critical Success Factors (CSFs) for ERP implementations**

There are many reported problems with ERP implementation projects (e.g. Dow chemicals, Dell computers, Mobil, etc.). One of the reasons for these problems is the technical challenges involved in implementing such a highly complex and rigid piece of software (Davenport, 1998a). In order to ensure the realisation of promised benefits and to avoid potential disappointments, researchers have attempted to determine the critical success factors (CSF) for ERP implementations. Rockhart (1979) has defined CSFs as “*those few critical areas where things must go right for the business to flourish*”. According to Shanks et al. (2000) some of the research on the CSFs in ERP implementations has developed a prioritised list of factors (Bancroft 1996, Shanks et al., 1999) and some has grouped them into strategic and tactical factors (Holland et al. 1999).

### **2.7.1 Twenty-two CSFs (Critical Success Factors) for ERP implementations**

In this section, I describe the 22 CSFs for ERP implementations reported by Somers et al. (2001) and support and extend them with the work of other scholars.

#### **2.7.1.1 Top management support**

The commitment and support of top management is among the most important factors that affect ERP implementations (Shanks et al. 2000, Somers & Nelson 2001, Bancroft 1996, Holland et al. 1999). According to McKersie & Walton (1991), the role and responsibilities of the top management should include an understanding of the limitations and possibilities of IT, the establishment of reasonable goals for the IT system, manifestation of strong commitment to the successful introduction of IT and the communication of the IT strategy to all employees. Hence, the top management needs to be actively involved in the implementation of an ERP system.

#### **2.7.1.2 Project champion**

The presence of at least one champion is a critical enabling factor for ERP implementation success (Willcocks & Sykes, 2000). A champion can be an individual employee of the organisation implementing an ERP who promotes the benefits of the ERP system (Shanks et al. 2000, Somers & Nelson 2001, Holland et al. 1999, Shanks et al. 1999).

### 2.7.1.3 User training and education

The importance of training for successful software implementations has long been emphasised (Somers & Nelson, 2001). All employees who use an ERP system need to be trained on functionality as well as on how they relate to the business process early in the implementation (Somers & Nelson, 2001, Shanks et al. 2000, Holland et al. 1999).

### 2.7.1.4 Management of expectations

Somers & Nelson (2001) have found that the expectations of a company about the capabilities of the ERP system have to be carefully managed as they have been established to relate to successful systems implementations. If the expectations are managed at the early stages of an ERP implementation project, most of the disappointments and frustrations can be avoided.

### 2.7.1.5 Vendor/customer partnership

Vendor and customer partnerships are particularly important to successful ERP implementations (Somers & Nelson, 2001). The vendor and its customer need to be able to collaborate during an ERP project, for instance to communicate their needs to the vendor. According to Willcocks & Sykes (2000), supplier partnering is a critical enabling factor for ERP project success.

### 2.7.1.6 Use of vendors' development tools

Somers & Nelson (2001) argue that the use of vendors' accelerators is a CSF for ERP implementations. *"There are indications that rapid implementation technologies and programs provided by the vendors can significantly reduce the cost and time of deploying ERP systems"* (Somers & Nelson, 2001).

### 2.7.1.7 Careful selection of the appropriate package

The selection of the right package is a critical factor for ERP implementations as choosing the wrong one can be a costly disaster (Slater, 1999). The choice of the right ERP system that best matches the organisational information needs and processes is critical to ensure minimal modification and successful implementation and use (Janson & Subramanian, 1996).



Gathering the right requirements in order to find the best matching ERP system is a crucial task.

#### 2.7.1.8 Project management

*“The vast combination of hardware and software and the myriad of organisational, human and political issues make many ERP projects huge and inherently complex, requiring new project management skills”* (Ryan 1999). A detailed project plan related to the project goals is an important critical success factor in ERP implementations (Shanks et al. 2000, Holland et al. 1999).

#### 2.7.1.9 Steering committee

According to Somers & Nelson, (2001) *“to make ERP succeed, it is necessary to form a steering committee or group of ‘super-users’”*. It should consist of employees from different corporate functions, project management members, and end users (Chimni (2000) quoted in Somers & Nelson 2001).

#### 2.7.1.10 Use of consultants

The use of external expertise is believed to be one of the CSFs for ERP implementations (Shanks et al. 2000, Holland et al. 1999). Consultants have knowledge from experience and can be a useful source of advice and information for companies implementing an ERP system.

#### 2.7.1.11 Minimal customisation

According to Shanks et al. (2000) *“minimising the scope of the ERP system implementation and the amount of customisation and option selection”* is a crucial CSF. A survey concerning ERP customisation policies suggests that 41% of the companies re-engineer their business to fit the system, 37% choose ERP systems that fit their business and needs minor customisations, and 5% customise the application to fit their business (Davis, 1998).

#### 2.7.1.12 Data analysis and conversion

*“A fundamental requirement for the effectiveness of ERP systems is the availability and timeliness of accurate data”* (Somers & Nelson, 2001). The data in existing legacy systems



must be accurate and carefully converted into the new system. Mistakes and inaccuracies can cause serious implementation delays.

#### 2.7.1.13 Business process re-engineering

One of the problems in implementing an ERP package is the incompatibility of its features with the company's information needs and business processes (Janson & Sumramanian 1996. According to Somers & Nelson (2001), *“to achieve the greatest benefits provided by an ERP system, it is imperative that the business processes are aligned with the ERP system”*.

#### 2.7.1.14 Defining the architecture

The choice of architecture during system procurement is critical for ERP implementations (Somers & Nelson, 2001). Key architectural considerations revolve around centralisation or decentralisation, compatibility of existing tools within the enterprise with the ERP system, and identification of bolt-ons such as data warehouses (Spangenberg, 1999).

#### 2.7.1.15 Dedicated resources

Dedicated resources are vital to realise the benefits associated with an ERP package, therefore project team members need to be fully released from other duties (Shanks et al. 1999, Somers & Nelson, 2001).

#### 2.7.1.16 Project team competence

The skills, experience, abilities and knowledge of the project manager and the rest of the team are important for ERP implementations (Somers & Nelson, 2001). The mix of the project team should consist of IT and business people who together understand the technological and business requirements of the company (Shanks et al. 2000).

#### 2.7.1.17 Change management

Change management is a primary concern, as implementing ERP systems involves changes to the business processes which impact directly on the employees. It has been estimated that half of the ERP implementations fail to achieve expected benefits because companies



underestimate the efforts involved in the change management (Somers & Nelson, 2001). Change management needs to be a significant part of any ERP implementation project.

#### 2.7.1.18 Clear goals and objectives

This is a very important factor for successful ERP implementations. A project should begin by clearly defining the goals and objectives of the project and the ways to achieve these (Somers & Nelson 2001, Shanks et al. 2000). At the end of each phase, the project management team will then be able to realise what objectives and goals have been met and to which extent.

#### 2.7.1.19 Education about new business processes

Another important factor for ERP implementations is effective communication by the management throughout the company of its short and long-term aspirations. *“When considering implementation coupled with business process re-engineering, it is imperative for managers to educate and communicate their goals and long-term perspectives in order to win support of all members of the organisation affected by the changes”* (Mahrer, 1999). The members of the organisation can then feel involved and be aware of the company’s objectives and vision.

#### 2.7.1.20 Interdepartmental communication

Effective communication within the project team, between the team and the rest of the organisation, and with the client company, is vital for successful ERP implementations (Somers & Nelson, 2001).

#### 2.7.1.21 Interdepartmental co-operation

When the employees of a department are united and co-operate effectively, they will also communicate their problems, solutions and ideas about the new system. When such a climate prevails, employees can overcome difficulties with the new system more easily. *“A key factor for the successful implementation of ERP systems requires a corporate culture that emphasises the value of sharing common goals over individual pursuits and the value of trust between partners, employees, managers and corporations”* (Stefanou, 1999).



### 2.7.1.22 Ongoing vendor support

*“ERP systems are a way of life and may be a lifelong commitment for many companies”* (Davenport, 1998a). Vendor support is a CSF as there will always be new modules and versions to install, as well as technical assistance, maintenance, upgrade factors (Somers et al. 2001).

## **2.7.2 Culture as a Critical Success Factor**

The aforementioned critical success factors cover many vital issues for successful ERP implementations. On the other hand, the issue of culture is omitted in all 22 CSF. Companies implementing an ERP have realised that it means substantial business process re-engineering, near complete organisational re-structuring, re-evaluation of business strategies and major cultural-change (Davenport 1998a, Gerber 1999, Caldas & Thomaz, 1998). This cultural change *accounts* for 60% of the implementation time (Gerber, 1999).

The aim of this chapter is to surface and realise the importance of culture in ERP implementations, as well as to enhance our understanding of it. In order to achieve this, we need to take research from other disciplines. In the next sections I discuss state of the art research into national and organisational culture by introducing the concept of culture and analysing the different approaches of the various scholars.

## **2.8 Introduction to research in culture**

There has been little research into culture in software engineering. Hence, I had to look for an understanding of culture by analysing literature from fields like psychology, management, sociology, organisational theory and human resources management. This section provides and establishes a theory base for culture from our research into the aforementioned disciplines. Figure 2.6 shows one possible decomposition of work into culture in order to understand and analyse it. The elements used below will be explored and discussed in the subsequent sections of the chapter.

The elements highlighted in bold in figure 2.6 are the basic elements of the cultural theory developed in this thesis. There are three basic types of culture identified in the literature; national, organisational and professional. From these, national and organisational are



highlighted and are analysed in more detail. In this thesis, national culture is reviewed in terms of cognitive, holistic and variable approaches and organisational culture in terms of the metaphor, internal and outside approaches. Within the cognitive approach of national culture, various models are discussed with an emphasis on Hofstede’s and Trompenaar’s dimensions. Within the outside approach of organisational culture, a number of models are analysed, in particular the culture dimensions from Hofstede and Trompenaars.

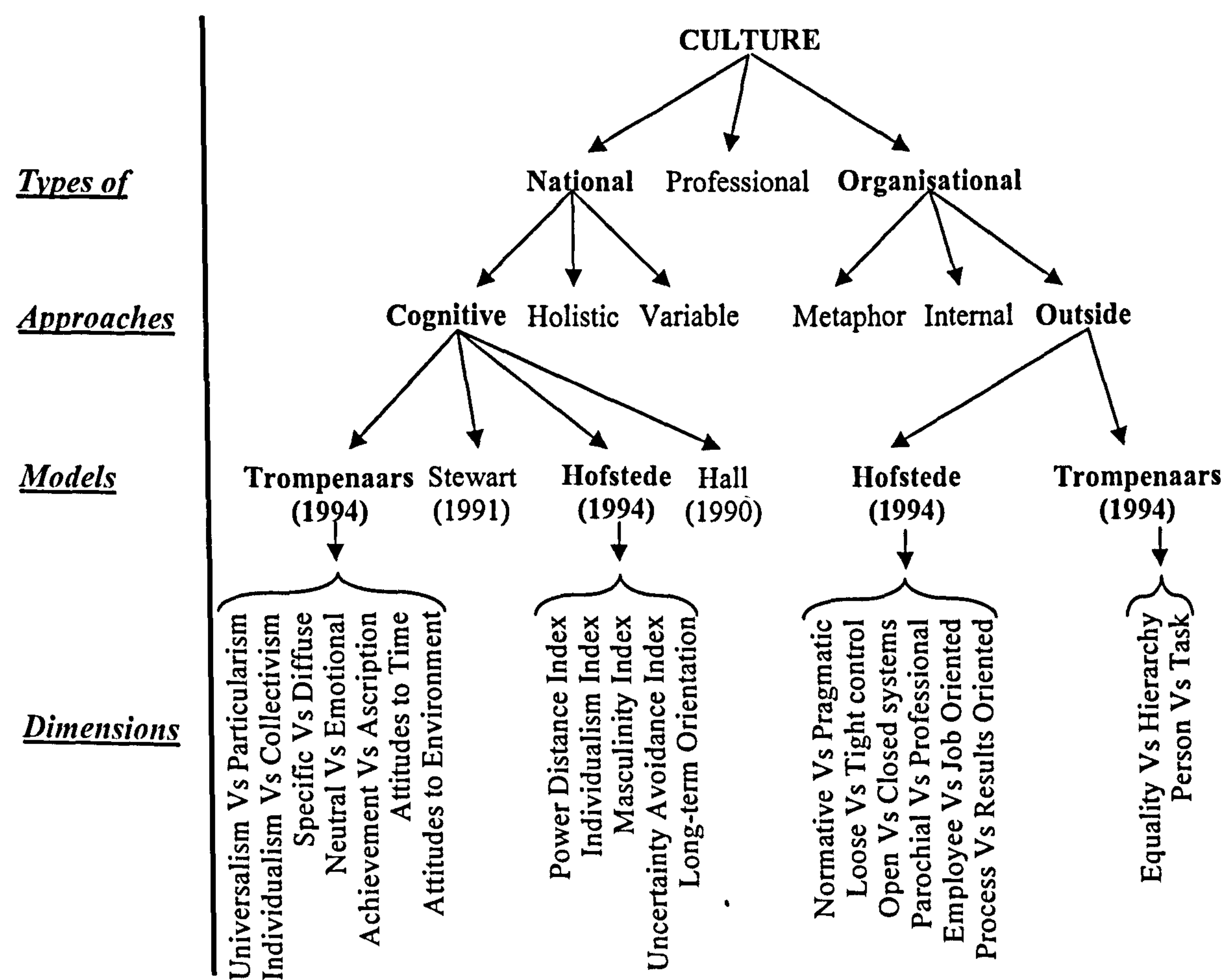


Fig. 2.6: A decomposition of culture

## 2.9 What is culture?

There is an abundance of definitions of culture. I use the theory provided by Trompenaars (1994) to decompose culture into three levels as shown above in figure 2.6. At the highest level we have national culture which can be determined by “*national boundaries*” (e.g. Spain, Italy) or “*regional society’s boundaries*” (e.g. Western Europe). At the next level we have the



corporate / organisational culture determined by *“how attitudes are expressed within a specific organisation”* (Trompenaars, 1994). Finally, we have sub-cultures, *“the culture of particular functions within an organisation, which tend to share certain professional and ethical orientations”* for e.g. in the information technology (IT) department, or marketing department (Trompenaars, 1994).

Hofstede (1994) argues that organisational cultures and national cultures are *“phenomena of different order”*. He adds *“among national cultures – comparing otherwise similar people – differences reside more in values, whereas among organisational cultures – comparing otherwise similar people in different organisations – differences reside in practice and much less in values”*. Entering an occupational field means acquisition of both values and practices.

According to the author *“each person carries around several levels of cultural programming, and culture is about your fundamental assumptions of what it is to be a person and how you should interact with other persons from your own group and with outsiders”* (Hofstede, 1994). National culture is the *“deepest and most difficult to change and will vary according to the culture in which we grow up”* (Hofstede, 1994). The other levels of culture can be taught and learned as persons go to school, to training, or to work in an organisation, and are more about how we should do things and behave in these levels (Hofstede, 1994). So, he states that these levels are *“more ways about doing things, or practices, as opposed to fundamental assumptions about how things are, as values, in the national level”*.

Hofstede’s point is an indicator that when we compare different national cultures, we should look and find differences in values, whereas when we compare different organisational cultures, the differences should reside more in practices (for example, explicit elements of culture like style, symbols, rituals, etc.).

This section of the chapter discusses each level in turn; national, organisational and occupational/professional cultures. However, in this thesis, I concentrate on two levels, the national and the organisational culture. There are 2 reasons for this. Firstly, at the early stages of this research, these two levels seemed to have the greatest impact on ERP implementations. Anecdotal evidence suggested that the national and organisational culture of a company influence the efficiency of ERP implementations (Densley 1999, Gulla et al. 1999, Gerber 1999, Davenport 1998). Secondly, I realised that the occupational/professional cultures give rise to other areas, for example personality and work in this area would be outside the scope of this thesis.



## 2.10 National Culture

Throughout the years, scholars have produced numerous definitions and perceptions of culture. In this chapter, the definitions are discussed using the three different approaches in national culture: holistic, variable and cognitive, as identified by Herkenhoff (2000) and shown in figure 2.6.

### 2.10.1 The holistic approach

The holistic approach draws on the work of anthropologists such as Kluckhohn (1951 quoted in Verbeke et al. 1998)) and Kroeber & Parsons (1958). Two definitions of national culture based on the holistic approach are the following:

*“Culture is that complex whole which includes knowledge, beliefs, art, morals, laws, customs and any other capabilities and habits acquired by man as a member of society”* (Taylor, 1871).

*“Culture is the transmitted patterns of values, ideas and other symbolic systems that shape behaviour”* (Kroeber & Kluckhohn, 1952).

National culture consists of traditional (i.e. historically derived) and selected ideas and their attached values: *“The approach is holistic because it integrates cognitive and behavioural patterns of culture”* (Verbeke et al. 1998). According to Munro et al. (1997), under the holistic approach, all aspects of human behaviour are seen as inter-locking systems. *“This approach does not focus on one domain as the pre-eminent basis for explanations about human action”* (Herkenhoff, 2000).

### 2.10.2 The variable approach

The variable approach focuses on the expressions of culture that are considered to be the manifestations of behavioural norms (Herkenhoff, 2000). Two definitions of national culture based on the variable approach are:

*“The way we get things done around here”* (Atkinson, 1990).



*"Our ideas, our values, our acts, even our emotions, are, like our nervous system itself, cultural products -- products manufactured, indeed, out of tendencies, capacities, and dispositions with which we were born, but manufactured nonetheless"* (Geertz, 1973).

Culture reveals itself through behaviours and practices related to underlying meanings (Verbeke et al. 1998). The variable approach concentrates on the behaviours of individuals only, rather than on collective behaviour (Herkenhoff, 2000).

### **2.10.3 The cognitive approach**

The cognitive approach focuses on the ideals, beliefs, values and norms as the core of national culture (Herkenhoff, 2000). Two scholars within the cognitive approach define national culture as:

*"... the collective programming of the mind which distinguishes the inhabitants of one country from another"* (Hofstede, 1994).

*"... the way in which a group of people solves problems. It is the concrete, observable things like language, food, or dress"* (Trompenaars, 1994).

Under this approach, national culture refers to the perceptions that enable an individual to behave in a certain way (Verbeke et al. 1998). The knowledge from these perceptions provides a standard of acceptable behaviour within a specific national culture.

In the next section, I describe the different approaches to organisational culture.

## **2.11 Organisational/Corporate Culture**

Owing to the large number of definitions of organisational culture, it is said that they offer '*an embarrassment of definitional richness*' and that '*the great diversity of opinion is unsurprising*' (Brown, 1995). According to Brown (1995), "*this is because even before the terms 'culture' and 'organisation' were used in combination, the term 'culture' has been defined in literally dozens of ways*".



Many scholars have grouped the definitions into categories. In the next section, I analyse Brown’s (1995) and Scott’s (1998) set of approaches for categorising the definitions and models of organisational culture. Following this, I provide rationale for the choice of approach for this research. Then, I provide definitions of organisational culture for our chosen set of approaches.

2.11.1 Approaches for categorising organisational culture

Brown (1995) argues that there is “a fundamental distinction between those who think of culture as a metaphor, and those who see culture as an objective entity” as depicted in figure 2.7.

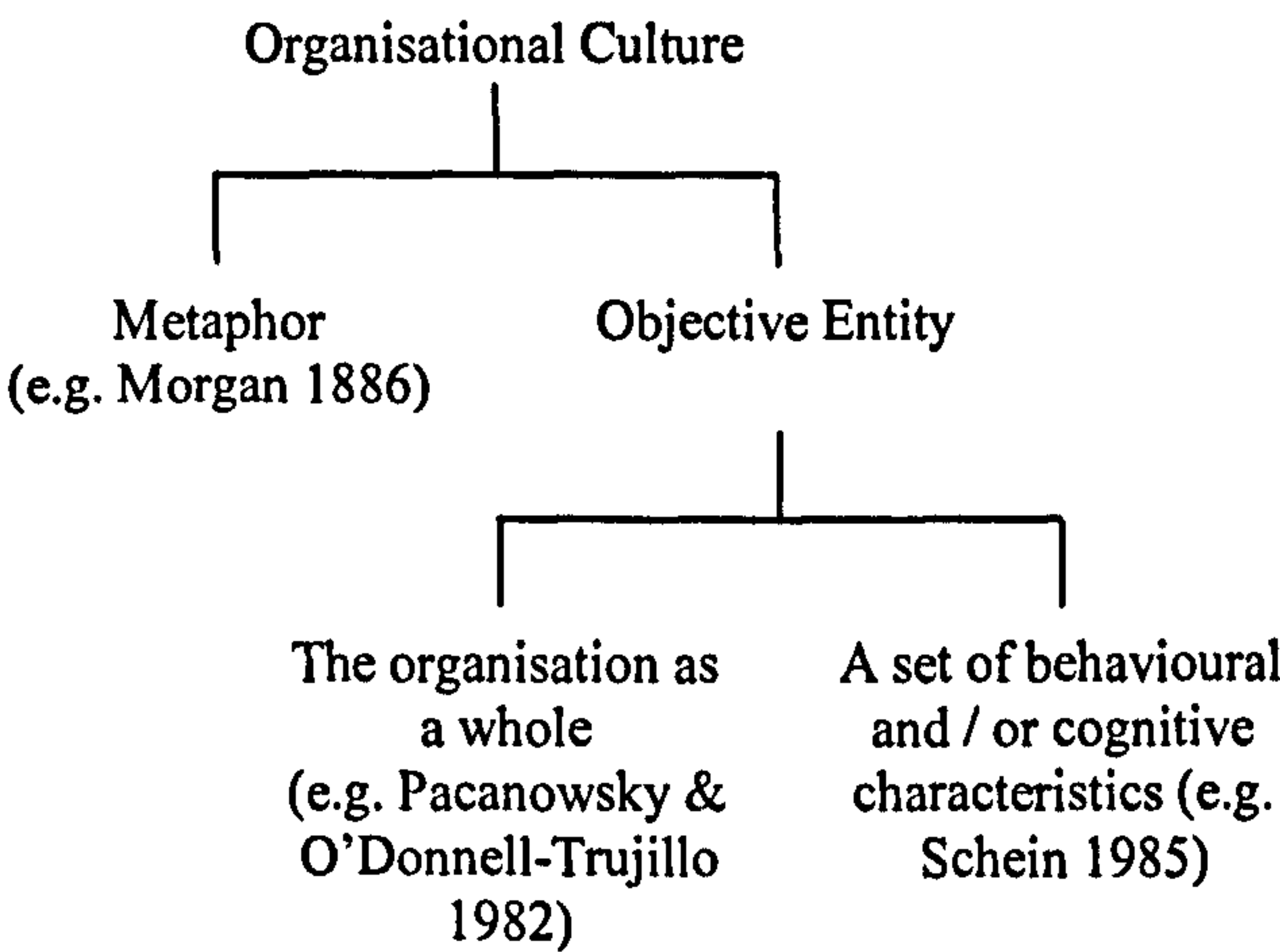


Fig 2.7: Classifying definitions of organisational culture, from Brown, 1995)

Culture is used as a metaphor in order to help us understand organisations. For example, a metaphor for a culture is *machine*. “In the field of organisation studies it has long been recognised that metaphors allow us to understand organisations in terms of other complex entities” (Brown, 1995). When culture is seen as an ‘objective entity’ it can be further classified into either an ‘organisation as a whole’, or ‘as a set of behavioural and, or cognitive characteristics’ (Brown, 1995). Authors who see culture as ‘the organisation as a whole’ see the whole organisation as being a culture in the literal sense. However, according to Brown (1995), this view has been resisted by many authors because “if everything is culture, then it is not possible to use the concept to frame causal explanations of other aspects of organisational activity” and “in effect this idea is almost indistinguishable from the view that culture should be thought as a metaphor”. In contrast, authors who see culture ‘as a set of behavioural and/or cognitive characteristics’, such as Schein (1985), have suggested that



*“culture is best thought of as a set of psychological predispositions that members of an organisation possess and which leads them to think and act in certain ways”.*

Conversely, Scott (1998) classifies organisational culture using 3 different approaches. The first one, which is similar to Brown’s approach (1995), defines culture as a metaphor. *“This view is more interpretive and looks at meanings and values that compose culture and examines the experience of work and what is meaningful to members”* (Scott, 1998). Scholars who view culture as a metaphor are not concerned with what organisations accomplish and how they can accomplish it more efficiently. They are concerned with how an organisation is accomplished and what it means to be organised (Scott 1998). The second approach views culture as an ‘internal variable’ and according to this notion, *“culture can be measured, can be related to other organisational variables and can be changed and managed, but generally does not change easily”* (Scott, 1998). The main concern of the scholars who view culture as an internal variable is how to create a better, stronger culture. The third approach views culture as an ‘outside variable’ which *“gets imported into an organisation through its members and is more concerned with cross-cultural comparisons or intercultural communication issues”* (Scott, 1998). Scott’s (1998) view is illustrated in figure 2.8:

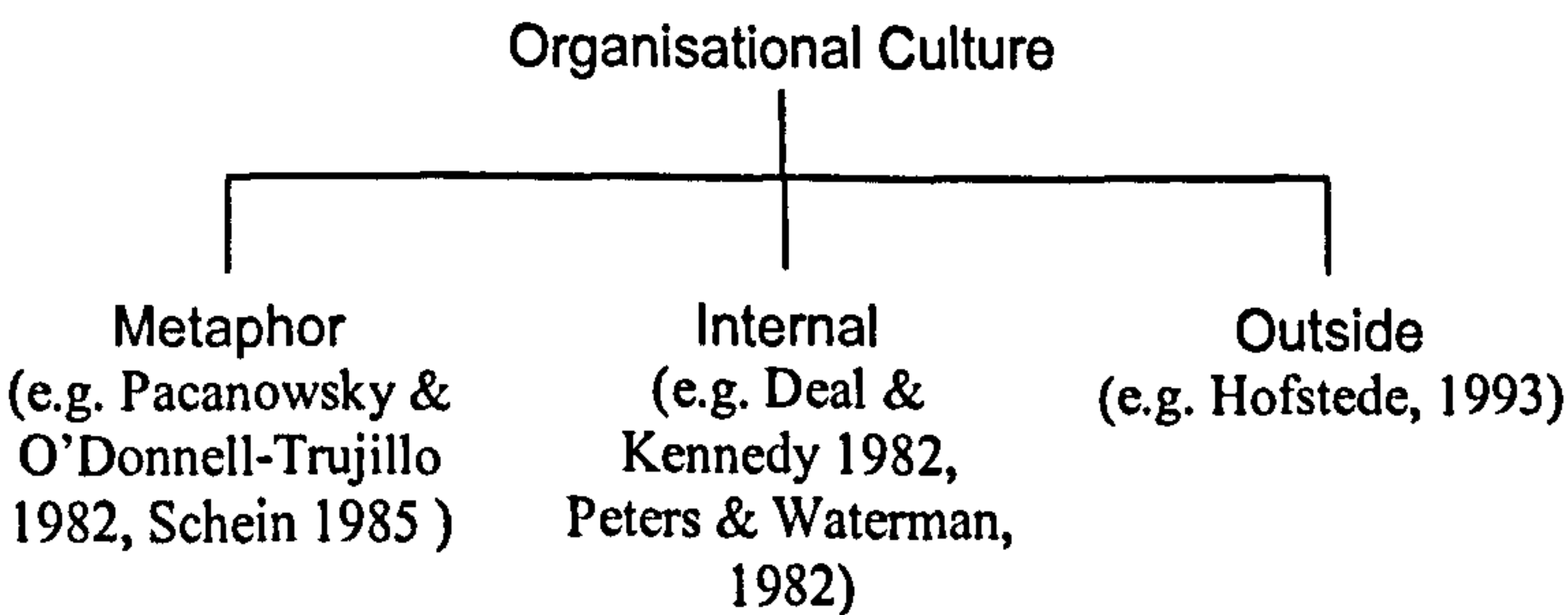


Fig 2.8: Organisational Culture: the three approaches, Scott 1998

Both Brown (1995) and Scott (1998) argue that culture can be thought of as a metaphor. Indeed, culture can be conceived as one from a whole list of metaphors (e.g. brain, machine, organisms, etc.) to help us understand it more easily (Morgan 1986, Peters & Waterman 1982). Many scholars have used metaphors to describe culture, or certain aspects of culture. For example, Hofstede (1994) uses the phrase ‘*software of the mind*’ as a metaphor to indicate reactions, behaviours and patterns of thinking of individuals, given their past, which vary from one social environment to another. So the collection of ‘*software of the minds*’ from the same social environment forms a culture. Although Hofstede might use metaphors to describe



culture, according to Scott (1998), Hofstede's approach of what culture is and how it is formed belongs to the '*outside*' categorisation of culture. Metaphors are indeed an easy way to describe cultural characteristics and inter-cultural situations as they can approximate the complex and ill-defined nature of culture from several directions (Beer, 2000). Apart from Hofstede (1994), there are many other authors that have used metaphors to describe certain features of culture without treating it as a metaphor (Trompenaars 1994, Deal & Kennedy 1982, Schein 1982, Hall & Hall 1990). It is a way of thinking about culture, which as described above, has its merits.

According to Brown (1995), organisational culture can also be viewed as an objective entity, which some authors think of as the organisation as a whole and others view it as a set of behavioural and/or cognitive characteristics. The view of seeing the organisation as a whole has been criticised by many scholars as mentioned above, because it is almost identical to the view of seeing culture as a metaphor (Brown, 1995). However, the notion of seeing culture as a set of behavioural and / or cognitive characteristics has been generally accepted by scholars and characterised as the best way to think about culture (Schein, 1985). It allows someone to understand and analyse why people of an organisation act and think in a certain way.

Scott's (1998) breakdown of the different views on culture is straightforward and easy to understand. Apart from the metaphor notion, he that thinks there are scholars who see culture as an '*internal*' or '*outside*' variable, all of which are described above. Through this distinction between '*metaphor*', '*internal*' and '*outside*', it is possible to classify the different approaches of the different scholars. For all the aforementioned reasons in this section, as the concept of culture is complex and ill-defined, I follow Scott's (1995) categorisation of the different approaches to organisational culture.

### **2.11.2 Defining organisational / corporate culture**

In this section, I define organisational culture for each of the 3 classifications provided by Scott (1998). Scott (1998) argues that organisational culture approaches can be classified into those who see culture as a metaphor (Morgan 1996, Pacanowsky & O'Donnell-Trujillo 1982, Schein 1985), those who view culture an internal variable (Deal & Kennedy 1982, Peters & Waterman 1982), and others who see culture as an outside variable (Hofstede 1994, Trompenaars 1994).



### 2.11.2.1 The metaphor approach

Organisational culture thought of as a metaphor is defined by Morgan (1986) as:

*“In talking about culture we are really talking about a process of reality construction that allows people to see and understand particular events, actions and objects, utterances or situation in distinctive ways. (...) Organisations are in essence socially constituted realities that rest as much in the heads and minds of their members as they do in concrete sets of rules and relations”*

Morgan (1986) argues that organisational culture is the process of people constructing a reality that makes them see and understand events, action, objects and situations in their own distinctive way. Scholars who see culture as a metaphor are interested in the way this reality is composed, the meanings and values behind it and their interpretations.

Another definition of organisational culture from a scholar who views culture as a metaphor is from Schein (1982):

*“A pattern of basic assumptions – invented, discovered or developed by a given group as it learns to cope with its problems of external adaptation and internal integration – that has worked well enough to be considered valid and therefore to be taught to new members as the correct way to perceive, think and feel in relation to those problems”*

Schein’s definition also demonstrates that scholars who see culture as a metaphor are interested in how an organisation developed the culture it has - its values, beliefs and norms - why, and what it means to the members of this culture.

### 2.11.2.2 The internal approach

Organisational culture, thought of as an internal variable, can be defined as:

*“The way we do things around here”* (Deal & Kennedy 1982, originally Bower, 1966)

*“A corporate culture is a cohesion of values, myths, heroes and symbols that has come to mean a great deal to the people who work there”* (Deal & Kennedy, 1982)



Deal & Kennedy (1982) adopted the first definition from Bower (1966) in order to describe the informal cultural elements of a business. In the second definition, they define culture through some attributes. Deal & Kennedy (1982) believe that the more characteristics that are attributed to an organisational culture, the stronger, more excellent and productive it is. The importance of finding how to create better, stronger, and more productive cultures, is the main difference of the internal approach from the outside approach to describe culture.

#### 2.11.2.3 The outside approach

Organisational culture can be thought of as an outside variable according to Hofstede (1994):

*“Organisational culture is the collective programming of the mind which distinguishes the members of one organisation from another”.*

Another definition of organisational culture is from Trompenaars (1994):

*“Organisational culture is the way in which attitudes are expressed within a specific organisation”.*

#### 2.11.2.4 Comparing the approaches

All three approaches offer important contributions to the theory of organisational / corporate culture. However, for the purposes of this thesis, I am concentrating on the ‘*outside*’ view of culture. The reasons for this are, firstly, that this view of culture is more concerned with cross-cultural comparisons and inter-cultural communication issues, which are very relevant to our research. Seeing culture as a metaphor is concerned with interpreting culture and looking at the meanings and values that culture is composed of. However, I am interested in interpreting the impact that culture has on the ERP implementations. The internal variable approach is more of a prescriptive approach, concerned with how to create a better and stronger culture. Whereas in this thesis, I concentrate on how to identify and predict possible culture-related problems and so how to create better and stronger ERP implementations to fit the culture of the client organisation.

Secondly, I am concentrating on the ‘*outside*’ approach because of the work of Trompenaars (1994) and Hofstede (1994), who both view organisational culture as an outside variable. Both scholars’ work has been highly accepted by other scholars and are considered as a norm



in the field, and many researchers have followed their theories and models. Thus, from now on in this thesis when I refer to organisational / corporate culture I refer to the ‘*outside*’ view of culture and Hofstede’s and Trompenaars approaches. This is analysed in detail in the subsequent sections of this chapter.

## 2.12 Sub-cultures / professional / occupational cultures

Within an organisational culture there is also “*the culture of particular functions, which tend to share certain professional and ethical orientations*”, referred to by some scholars as sub-cultures, and by others as professional cultures (Trompenaars, 1994). This could be the culture in the information technology (IT) department, or in the marketing department. “*It would be convenient to refer to organisations as if they possessed a single, homogenous culture, but this is rarely the case in practice, and the study of organisational culture would be incomplete without a thorough examination of the culture of employees from lower-level jobs*” (Brown, 1995). Most organisations, independent of their size, have many sub-cultures, whose values, beliefs and norms may be in contradiction with the espoused culture of the organisation. “*Organisations, like the societies in which they exist, tend to be fragmented, consist of multiple groups, and be dominated by political activity*” (Brown, 1995). Employees in different departments or work-groups face different problems, develop different solutions to these problems and so develop their own values, beliefs and attitudes. This is referred to as a sub-culture. As discussed in chapter 1, sub-cultures/professional/occupational cultures are outside the scope of this thesis.

## 2.13 Characteristics of culture

The concept of culture is very complex and ill defined. Many of the scholars (Williams et al. 1993, Hofstede 1994, and Hoecklin 1995), besides defining culture, have identified characteristics to facilitate its understanding. Some of the characteristics refer to national culture and others to organisational culture.

To support our discussion about the characteristics of culture, I introduce these characteristics by inventing a narration of a hypothetical person called Hope born and living in a country called Landville where she works in a company called Success Plc. (please note that the characteristics of culture are underlined).



Hope has her individual beliefs, attitudes and values, which she has gained from her individual environment in Landville – her family, her school, her friends, etc. She does not have those beliefs, attitudes and values from her genetic make-up (Hoecklin, 1995). Culture is something that she learnt (Williams et al. 1993), not something she was born with. In a similar manner, she assimilated the organisational culture of Success Plc. when she started working there.

Culture is partly unconscious (Williams et al. 1993) and as such, Hope and most of the inhabitants in Landville, have commonly held beliefs which are unconscious. This can happen in two ways; “*First, members may unconsciously process information that influences the way they think and secondly, beliefs, attitudes and values that underlie behaviour may repeatedly lead to success to the extent that they become taken for granted*” (Williams et al. 1993). For instance, in Landville, the younger inhabitants like Hope, out of deference, clasp their palms when talking to elders. This is a way of behaving which Hope unconsciously processed when she was young, either because she was told to and/or because she observed other people belonging to the same culture doing so. In the same way, in Success Plc. the employees, including Hope, believe that customers deserve the best service and their behaviour reflects this corporate belief, which has led to an increased customer loyalty. Hope tries her best to provide good customer service, and she does so instinctively because, in her experience, it has been proven to provide positive outcome.

Culture is both an input and an output (Williams et al. 1993). “*Culture is both the product of action and a conditioning element of future action*” (Williams et al. 1993). In our example, the characteristic patterns of behaviour of Hope and her fellow inhabitants create the national culture of Landville which will be passed on through generations. However, Hope and the rest of the inhabitants are also a product of the culture, as their parents’ patterns of behaviour were also conditioned by the same national culture. The same holds for the organisational culture of Success Plc. The procedures and rules that Hope has accepted as the work environment of the company she works in create the work environment for other new members. However, Hope has been working at Success Plc for 7 years now, and is a product of this organisational culture. She has learned to follow and accept these rules and procedures because she has been conditioned to by the culture in which she has been involved.

Culture is historically-based and the values, behaviours and beliefs of a culture influence successive generations (Williams et al. 1993, Hofstede 1994). For example, Hope’s parents grew up during the war and they went through periods of hunger. For this reason, they brought Hope up to always eat all her food. Hope’s parents’ values and beliefs are that people



should eat all their food and never to throw food away. The chances of Hope bringing up her children the same way in this respect are very high. Organisational culture is also historically based. Organisational values, beliefs and behaviours are shaped by the history of a company and are passed on through successive generations. Therefore, it is generally agreed that the history of an organisation or a country can help a lot with the understanding of their culture.

According to Williams et al. (1993) the beliefs, attitudes and values of a culture are commonly held and not shared. Hope and her fellow inhabitants in Landville did not reach a consensus on how to think and behave in a given situation and therefore did not share values, beliefs and attitudes. Nevertheless, they still tend to think and behave similarly as the common learning, history and experience and a common environment makes them hold common beliefs, values and attitudes (Williams et al. 1993). The same holds for the attitudes, values and beliefs of Hope and her co-employees at Success Plc.

Culture is heterogeneous, either within a country or an organisation (Williams et al. 1993). The reason is that “*common beliefs form around objects of common concern*” (Williams et al. 1993). For instance, objects of common concern for people can be religion, profession or political views. Hence, an organisational culture is unlikely to be homogeneous as most of them have sub-cultures, which tend to sub-divide the commonly held beliefs, attitudes and values within those sub-cultures (Williams et al. 1993). The same holds for national culture as well. Therefore, the inhabitants of Landville, including Hope, are part of some sub-cultures. For example, Hope is a member of an animal welfare organisation and she holds on to some beliefs, which are the same as the other members of this organisation. The same happens in Success Plc. as Hope is a software developer and she and her colleagues belong to a sub-culture with its own beliefs, values, rituals, heroes, etc.

The aforementioned characteristics of culture provide a basic understanding of what is culture. In the following section, I will deconstruct culture by analysing the models of national and organisational culture and the elements that constitute culture.

## 2.14 Reconstructing culture

This section is divided into two sub-sections. The aim of the first sub-section is to deconstruct culture into its parts in order to systematically analyse each one in turn. In the second sub-section, I discuss existing models of culture based on these parts.



2.14.1 Disseminating manifestations of culture

Most of the scholars have developed simple illustrations of the manifestations of culture, which are discussed in the next section. In this section however, I analyse those manifestations of culture that the authors incorporate into their models of national and organisational culture. The principal comparisons are between manifestations of culture by Hofstede (1994) and Trompenaars (1994), and between other authors from other approaches to researching culture. The aim is to provide a general and more holistic understanding of culture that highlights any interesting or missing manifestations of culture that Hofstede (1994) and Trompenaars (1994) have not included in their models.

Table 2.1 presents what some of the main researchers argue are the manifestations of culture (Williams et al. 1993, Hofstede 1994, Trompenaars 1994, Schein 1985, Deal & Kennedy 1982 and Johnson & Scholes 1992). The manifestations in common are depicted with a tick (√). The definitions of all the elements and the overlaps detected are discussed further in this section.

Authors/ Elements	Williams et al.	Hofstede	Trompenaars	Schein	Deal et al.	Johnson
Values	√	√	√	√	√	
Norms			√			
Beliefs	√			√		
Attitudes	√					
Artefacts/ Products			√			
Symbols		√	√			√
Basic Assumptions/ Paradigm			√	√		√
Org. Structure						√
Cultural Network					√	
Myths/Stories						√
Business Environment					√	
Behaviours	√					
Control Systems						√
Power Structures						√
Rites/Rituals/Routine		√			√	√
Heroes		√			√	

Table 2.1: The manifestations of culture (Williams et al. 1993, Hofstede 1994, Trompenaars 1994, Schein 1985, Deal et al. 1982 and Johnson 1992)



### 2.14.1.1 Value

A value is one of the manifestations that is most commonly used by the authors. Schein (1985) believes values to be *“often written down as imprecise statements about the mission, objectives or strategies of an organisation”*. Deal & Kennedy (1982) argue that values are *“the basic concepts and beliefs of an organisation; as such they form the heart of the corporate culture, they define success in concrete terms for employees and establish standards of achievement within the organisation”*. Trompenaars (1994) believes that *“values determine the definition of ‘good’ and ‘bad’ and are therefore closely related to the ideals shared by a group of individuals”*. His view of what values are is similar to Hofstede’s (1994) in the sense that they both see values along a spectrum, with ‘good’ and ‘bad’ in either ends. Hofstede (1994) considers values to be *“tendencies to prefer certain states of affairs over others; feeling with positive or negative side; for example evil vs. good, irrational vs. rational, etc.”*. The same author points out that it is important when trying to understand values to distinguish between ‘desirable’ and ‘desired’; *“how people think the world ought to be versus what they want for themselves”*. What actually distinguishes them *“is the nature of the norms involved, which are the standards for values that exist within a group or category of people”* (Hofstede, 1994). Williams et al. (1993), provide a similar argument, in that there are two kinds of values, the ‘moral’ and the ‘instrument’ ones, where the former *“carry a sense of obligation – of ‘should’ or ‘ought’ – and indicate what is correct or proper”* whereas the latter *“reflect a desire or preference and are virtually indistinguishable from attitudes”*. Regardless of the definition used, it is difficult to identify clearly what the values are within a given country, organisation or department. Additionally, it will be difficult to distinguish them from a couple of other manifestations that helps us to define what is culture.

### 2.14.1.2 Norms

Norms are only considered to be a manifestation of culture by Trompenaars (1994). According to the author, norms are *“the mutual sense a group has of what is ‘right’ or ‘wrong’, and can develop on a formal level as written laws, or on an informal level as social control”*. They are vital for organisations as *“they provide coherence and structure to a culture and thus facilitate predictable and stable patterns of behaviour”* (Brown, 1995). They dictate the behaviour of the individuals, and what is considered acceptable and what not. Norms can be used for both the national and the organisational level of culture. However, there are occasions when it is difficult to recognise the norms that really exist and the norms that are just desired by the organisation or society.



### 2.14.1.3 Beliefs

According to Schein (1985), beliefs are issues that individuals can recognise and discuss. This could be their opinion on a specific subject area such as *“service to the community”*. Furthermore, according to Brown (1995) *“beliefs concern what is and is not true”*. According to Williams et al. (1993) *“a belief refers to the information that an individual has about an object, specifically a belief links an object to an attribute”*. However, the authors point out that the term *‘belief’* is being used in a number of ways that are different from the way that they are defining beliefs. The first way can be *‘their’* way when it refers to *“the information or knowledge an individual possesses”*. The second way *“may signify faith or trust”*; or *“it may signify agreement”* (Williams et al. 1993). The last way, according to the authors, can be easily mixed up with the values, and many authors use the phrase *‘peoples’ beliefs’*, and are referring to *‘peoples’ values’* (Williams et al. 1993). In fact, *“in practice, beliefs and values are often hard to distinguish between, because beliefs about how the world works frequently involve values, that is views about what should or ought to be done”* (Brown, 1995). Hence, a definition is required which will help us to distinguish clearly between beliefs from values.

### 2.14.1.4 Basic assumptions / Paradigm

Basic assumptions and/or paradigms are the taken-for-granted solutions to identifiable problems (Brown, 1995). All authors who state that these are a manifestations of culture believe that they are implicit and difficult to identify (Schein 1985, Trompenaars 1994, Johnson & Scholes 1992). According to Johnson & Scholes (1992), basic assumptions/paradigm are the perception (for the public) of what a specific organisation or country is (reflected by the assumption within the paradigm). Trompenaars (1994) believes that *“in order to answer questions about basic differences in values and norms between cultures it is necessary to go back to the core of human existence, to the basic assumptions about existence”*. He believes that *“the most important value that people strive for is survival”* and from that he assumes that *“each civilisation has organised itself in order to find the ways to deal most effectively with their environments, given their available resources”* (Trompenaars, 1994). Hence, organisations, societies, groups of people have *‘organised themselves’* in such a way, that they will be able to solve the problems they might face in the best possible way (Trompenaars, 1994). If their culture changes it is because the *“old ways of solving problems are not working anymore, or new ways are working better”* (Trompenaars, 1994). Schein (1985) argues that *“a culture may be defined in terms of its basic assumptions”* and *“a near synonym for basic assumptions are theories-in-use”* (Brown, 1995). So, it can be



concluded that basic assumptions are the unconscious, tested solutions that a group of people use to guide their behaviour.

However, basic assumptions and/or paradigms can be confused with beliefs. According to Schein (1985), *“an organisational leader’s beliefs can be transformed into collective beliefs over time through the medium of values”*. For example, when the organisation faces a problem, and the leader provides a solution, then the employees will consider his view to be a declaration of the leader’s values, and not as one of his beliefs (Brown, 1995). If his proposed solution works, it will be regarded as the way that work should be done, and may be considered as a basic assumption (Brown, 1995). However, Brown (1995) suggests that there are three main differences between them that might help us between them. The first difference is that beliefs are conscious and can be reported, whereas basic assumptions are unconscious and very difficult to surface (Brown, 1995). Secondly, beliefs can be more easily modified than the basic assumptions, and thirdly, beliefs are *‘simple cognitions’* whereas the basic assumptions are *“complex, interpretations of the beliefs plus values and emotions”* (Brown, 1995).

#### 2.14.1.5 Attitudes

Attitudes are considered to be a manifestation of culture by Williams et al. (1993) who define them as *“the learned preconditions to respond in a consistently favourable or unfavourable manner to a given object or idea”*. As mentioned earlier, it is difficult to separate values and attitudes, but attitudes are *“likes or dislikes which predispose the individual to respond in a particular way”* whereas *“values refer to agreement or disagreement”* (Williams et al. 1993). These manifestations also hold both levels of culture: national and organisational. However, as discussed earlier attitudes, values and maybe even norms are frequently not clearly defined and hence distinguishable. Clear and distinct definitions of all of these manifestations are needed.

#### 2.14.1.6 Symbols

According to Hofstede (1994), symbols *“can be a simple gesture, a phrase, a word or even a cloth, a hairstyle, a food”*. According to the author, all cultures create symbols, so as to empower their norms and values (Hofstede, 1994). However, they are superficial as they can easily change, disappear and be copied (Hofstede, 1994). Johnson & Scholes (1992) argues that symbols *“such as logos, offices, cars and titles, or the type of language and terminology*



*commonly used, become a short representation of the nature of the organisation*". Symbols describe national and organisational culture equally.

#### 2.14.1.7 Artefacts / Products

Artefacts and products *"mirror how an outsider would perceive the culture to be"* as they are *"the observable reality of the language, food, buildings, etc, they are the symbols of the other more implicit levels of culture, the norms, values and the basic assumptions"* (Trompenaars, 1994). Artefacts and products can be confused with that other manifestations of culture; symbols. This is partly due to the above definition of artefacts and products, which holds for symbols as well. From this point it can be argued that it is difficult to recognise and distinguish between artefacts and products and symbols, as they are not clearly defined. Artefacts and products are manifestations of both national and organisational culture.

#### 2.14.1.8 Organisational structure

Organisational structure is *"the way the structure of an organisation is organised; centralised, decentralised, etc"* (Peters & Waterman 1982). According to Johnson & Scholes (1992), *"it is likely to reflect power structures and again define important relationships and emphasise what is important for the organisation"*. In other words, organisational structure refers to a hierarchical structure within a culture, the different levels between a simple employee and the top manager and the level of responsibilities and autonomy that each employee has. This manifestation is more applicable to organisational cultures, but can also describe national cultures in respect to how the social structure of the country is organised and what the relationships between the different social classes are.

#### 2.14.1.9 Cultural network

The cultural network is described by Deal & Kennedy (1982) as a manifestation of culture. According to Deal & Kennedy (1982) *"the cultural network, as the primary but informal means of communication within an organisation, is the carrier of the corporate values and heroic mythology, and when working effectively is the only way to get things done or to understand what is really going on"*. The cultural network is a manifestation that can be regarded for both national and organisational cultures.



#### 2.14.1.10 Stories and myths

According to Johnson & Scholes (1992), stories and myths are *“the stories told between the members of the organisation, to outsiders, to new recruits, etc. that embed the present in its organisational history and also flag up important events and personalities”*. *“Myths are generally circulated in organisations in the form of narratives and are often indistinguishable from stories, except that events they describe are fully fanciful”* (Brown, 1995). Hence, when analysing stories and myths, it is difficult to differentiate between the two. However, they are important devices of cultural values and beliefs, rules and procedures, power structure of the organisation, and the consequences of the rules (Brown, 1995). Stories and myths are manifestations of both national and organisational culture.

#### 2.14.1.11 Business environment

The business environment, according to Deal & Kennedy (1982), is a manifestation of a culture. *“Each company faces a different reality in the marketplace, depending on its products, competitors, customers, technologies, government influences, etc, and in order to succeed in its marketplace, each company must carry out certain kinds of activities very well”* (Deal & Kennedy 1982). In other words, it means that the environment is a major factor influencing the culture of an organisation or a country, as it has to change and adapt to the dynamics of its business environment. Deal & Kennedy (1982) apply this manifestation to organisational culture only. For example, the business environment of the car manufacturer Fiat is made up of its competitors (the other automobile manufacturers), the government rules and regulations of the countries that it is operating in, the technology innovations in the automobile area, etc.

#### 2.14.1.12 Behaviour

Behaviour, according to Williams et al. (1993), is the way that we behave in certain situations. Our behaviour is not influenced by our attitudes but by our beliefs about *‘various situational contingencies’* (Williams et al. 1993). This manifestation of culture is applicable to both national and organisational cultures.



#### 2.14.1.13 Control Systems

According to Johnson & Scholes (1992), control systems are the measurements and reward systems that *“emphasise and reflect what is important to monitor in the organisation and where to focus attention and activity upon”*, thus a manifestation of organisational culture. However, it can be assumed that it refers to national culture as well. For example, control systems can be the measurements and reward systems that emphasise and reflect what is important to monitor in a country and where to focus attention and activity upon (Johnson & Scholes 1992).

#### 2.14.1.14 Power structures

Power structures, according to Johnson & Scholes (1992), are *“likely to be associated with the key constructs of the paradigm, which is in some respects the ‘formula for success’ which is taken for granted and likely to have grown up over years”*. Johnson & Scholes (1992) also argues that *“the most powerful managerial groups within the organisation are likely to be closely associated with this set of core assumptions and beliefs”*. For example, accountancy companies offer a whole range of services, but typically the most powerful individuals or groups of individuals within these companies have been qualified accountants with a set of assumptions about the business and its market rooted in the audit practice (Johnson & Scholes, 1992).

#### 2.14.1.15 Rites, rituals and routines

Rites, rituals and routines can all be regarded as another defining manifestation of a culture (Hofstede 1994, Deal & Kennedy 1982, Johnson & Scholes 1992). Deal & Kennedy (1982) believe that rites and rituals are the *“systematic and programmed routines of day-to-day life in a company, which show to the employees the kind of behaviour that is expected of them, and provide visible and potent examples of what the company stands for”*. Johnson & Scholes (1992) agrees with the view of Deal & Kennedy (1982) and define rituals to be *“the special events through which the organisation emphasises what is important and reinforces ‘the way we do things around here’”*. For instance, these events could be interview panels, training programmes, sales conferences, drinks after work, and Christmas parties. Hofstede (1994) believes that rituals are *“collective activities, which have a symbolic rather than a practical meaning”*. Routines, according to Johnson & Scholes (1992), are *“the ‘routine’ way that members of an organisation behave towards each other, and towards those outside the*



*organisation, which make up 'the way we do things around here'". "However, routines can also represent a taken-for-grantedness about how things should happen which is extremely difficult to change and protective of core assumptions in the paradigm" (Johnson & Scholes, 1992). Rites, rituals and routines can be assumed to be together as one manifestation of culture, as the definitions mentioned above do not give clear boundaries so as to be able to separate from one another. Rites, rituals and routines, are manifestations of culture that can be relevant to both national and organisational culture.*

#### 2.14.1.16 Heroes

According to Hofstede (1994), heroes are *"persons who possess characteristics which are highly praised in a culture and hence serve as role models of behaviour, who might be dead or alive, real or imaginary, for example movie stars, singers, etc"*. Deal & Kennedy (1982) resonate this in that *"these people personify the culture's values and as such provide tangible role models for employees to follow"*. This manifestation is applicable to organisational and national cultures.

#### 2.14.1.17 Conclusions

The reported manifestations of culture have been described and several issues arose. Firstly, in some cases, it is very difficult to distinguish between some of the manifestations due to their weak definitions. Secondly, the definitions are informal interpretations of the manifestations and formality of some form can make these definitions more precise.

Nevertheless, they are important to ERP implementations as they can provide lots of useful evidence about the influence of culture on ERP implementation projects. Therefore there is a need for more clear and consistent definitions of these manifestations, in order to be able to recognise culture-related problems in ERP implementations, which is the aim of the research in this thesis.

### **2.14.2 Models of culture**

In this section I describe Hofstede's (1994) and Trompenaars's (1994) models of culture further because they belong under the selected approach of culture (see 2.11.2.4 page 64). As shown in figure 2.6 and discussed earlier in the chapter, Hofstede (1994) and Trompenaars



(1994) adopt a cognitive approach to national culture and an outside approach to organisational culture.

Many researchers in culture have used models to illustrate the manifestations that make up culture. Hofstede (1994) and Trompenaars (1994) have used models that are illustrated as *'skins of an onion'* in order to indicate the level of implicitness or explicitness of the elements (Hofstede 1994, Trompenaars 1994, Schein 1985). Nevertheless, the scholars' models differ in certain ways.

#### 2.14.2.1 Hofstede's (1994) model of culture

Hofstede (1994) states that cultural differences, whether national or organisational, manifests themselves in several ways. *"From the many ways to describe manifestations the following four together cover the total concept rather neatly: symbols, heroes, rituals and values"*. He illustrates those in figure 2.9 below:

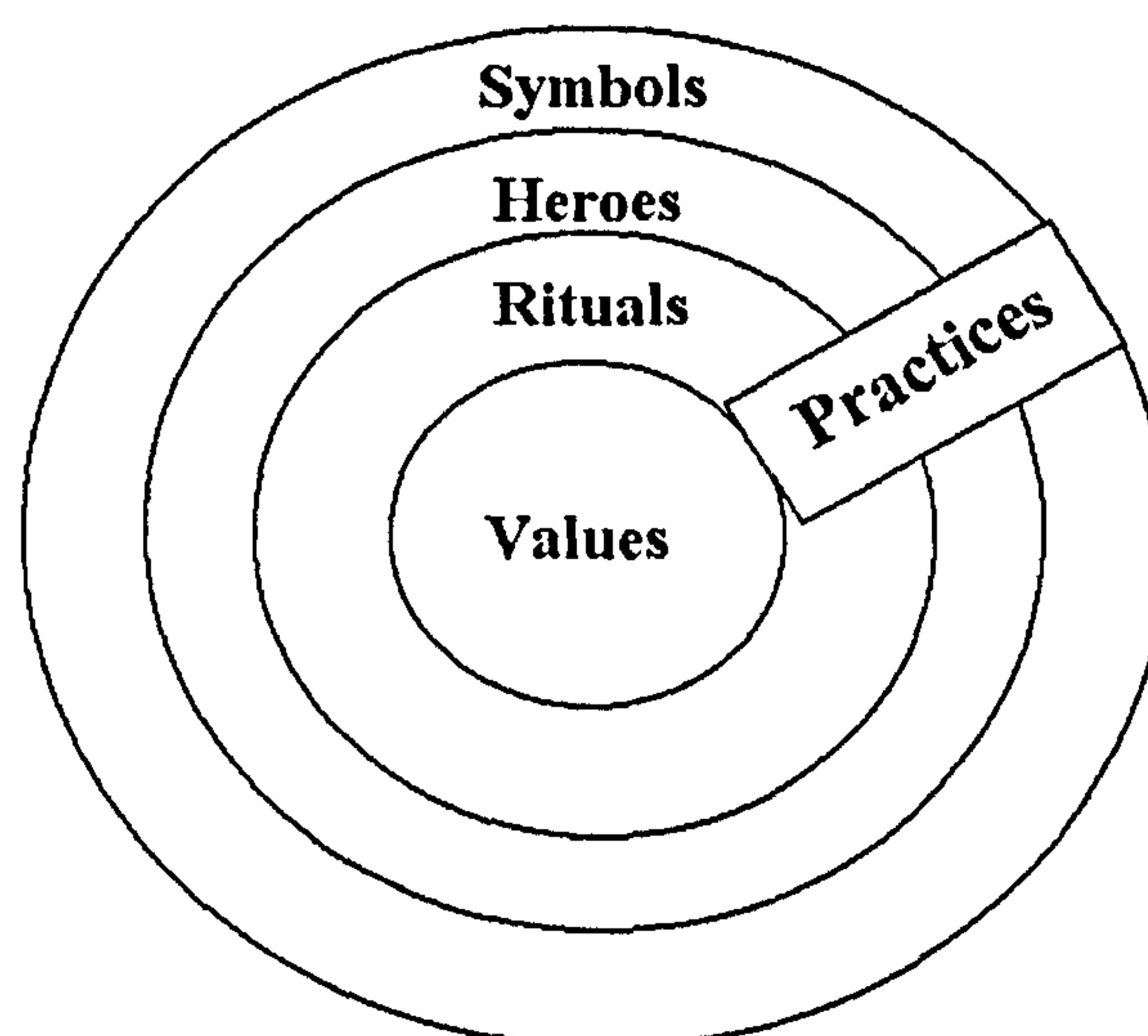


Fig 2.9: *"The 'onion diagram': manifestations of culture at different levels of depth"*  
(Hofstede, 1994)

*"The manifestations of culture are illustrated as the 'skins of an onion', indicating that symbols represent the most superficial and values the deepest manifestations of culture, with heroes and rituals in between"* (Hofstede, 1994). Symbols have been put into the outer, most superficial layer because, according to Hofstede, symbols can easily change. *"New symbols are easily developed and old ones, disappear: symbols from one cultural group are regularly copied by others"* (Hofstede, 1994). Heroes and rituals are considered by Hofstede to be less superficial than symbols but still not implicit because these two manifestations of culture are also prone to change. As seen in figure 2.9 above, symbols, heroes and rituals have been



placed under the term *'practices'*. *"As such, they are visible to an outside observer; their cultural meaning, however, is invisible and lies precisely and only in the way these practices are interpreted by the insiders"*. According to Hofstede, values are the most implicit manifestation of culture because *"they are acquired so early in our lives, many values remain unconscious to those who hold them"*. Therefore, values that people hold cannot be discussed or directly observed. Instead, they can only be inferred by an outsider from the way these people act under different circumstances (Hofstede, 1994).

#### 2.14.2.2 Trompenaars's (1994) model of culture

Trompenaars (1994) states that members of a culture together constitute a connected system of meanings and a shared definition of a situation, achieved through social interaction. The condition for that is the existence of mutual expectations. *"What somebody expects depends on where he comes from and the meanings he gives to what he experiences"* (Trompenaars, 1994). According to Trompenaars (1994) these expectations can either be concrete and explicit or implicit and subconscious. Trompenaars (1994) illustrates this point in a model of culture shown in figure 2.10 below:

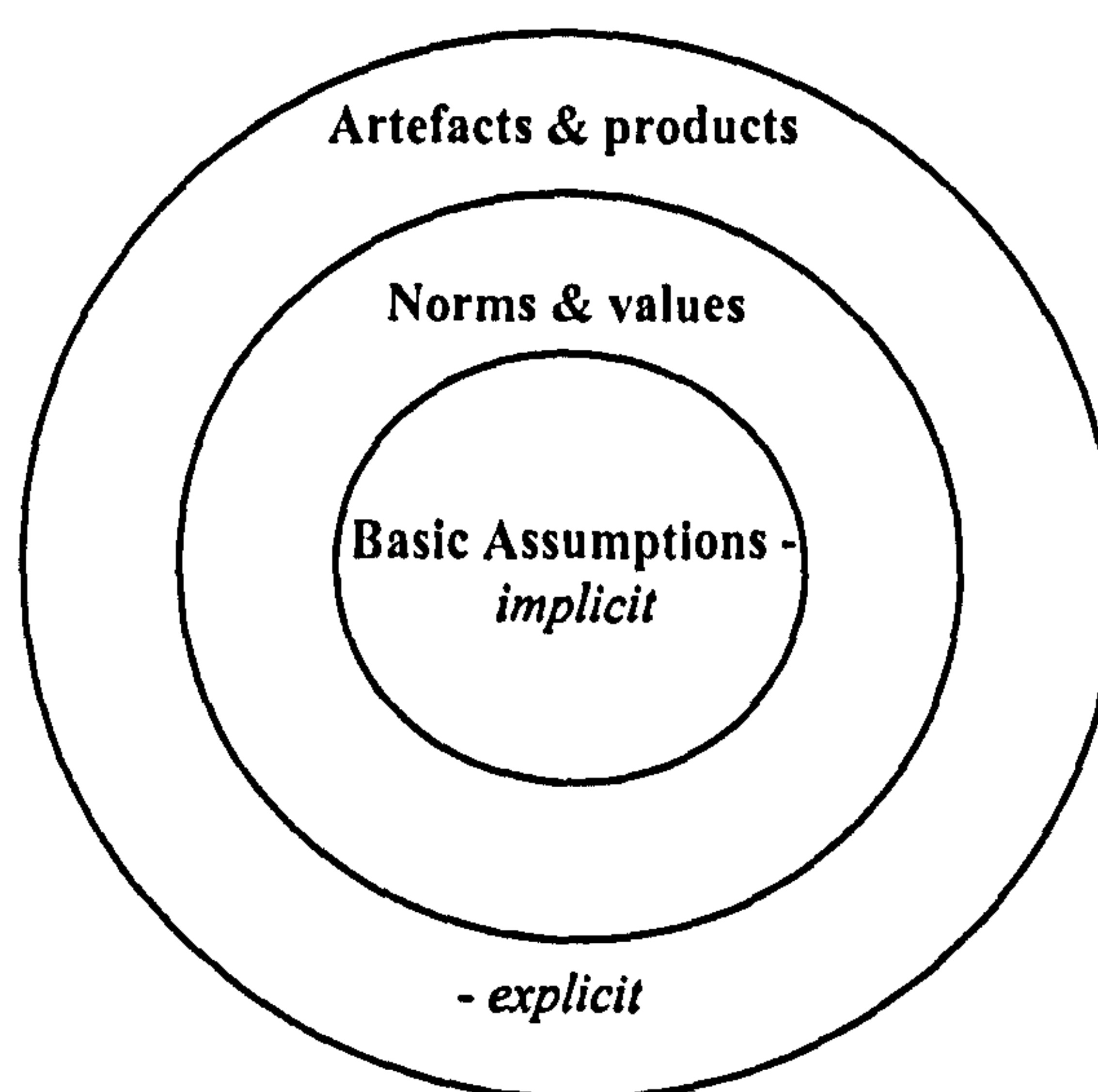


Fig 2.10: A model of culture (Trompenaars, 1994)

Trompenaars (1994) states that the artefacts and products are the most explicit manifestations of culture, the symbols of a deeper level of culture. This explicit level of culture forms an individual's first experience of a new culture (Trompenaars, 1994). In the middle layer of the model in figure 2.10 lie the norms and values. The artefacts and products reflect this layer of culture typified by the norms and values (Trompenaars, 1994). Norms and values are less



observable than the artefacts and products because they can either exist on an explicit level, like written laws, or they can exist on an implicit level, as in the form of the unconscious mutual sense of a group of people (Trompenaars, 1994). According to Trompenaars (1994) the most implicit manifestation of culture are the basic assumptions because they are unconscious and '*disappear from our awareness*' as they are passed on through generations.

#### 2.14.2.3 Comparing Hofstede's (1994) and Trompenaars's (1994) models

Hofstede's (1994) and Trompenaars's (1994) models have both some similarities and differences in terms of the manifestations of culture, their meaning and their respective level of implicitness.

As seen in figures 2.9 and 2.10, Hofstede's (1994) and Trompenaars's (1994) models of culture have only one manifestation in common - *values*. As discussed earlier in the chapter, both see *values* along a spectrum of '*good*' and '*bad*'. However, they disagree on the *values*' level of implicitness. Hofstede (1994) believes *values* are the most implicit manifestation of culture, whereas Trompenaars believes they are relatively implicit, but *basic assumptions* are the most implicit manifestation.

Furthermore, Hofstede's (1994) manifestation of culture i.e. *symbols*, can be regarded as very similar to Trompenaars's (1994) *artefacts and products*. The meaning that both scholars' give to these manifestations of culture is similar and even the definition that Trompenaars (1994) provides for *artefacts and products* implies that they are the same as *symbols*. In addition, both researchers regard their respective manifestation of culture to be the most explicit one, both placing them in the outermost layer of their models of culture.

However, the 2 authors models differ in other ways. For example, the Trompenaars (1994) model does not consider *heroes* to be a manifestation of culture, as he does not include it in his model of culture in figure 2.10. Similarly, Hofstede (1994) does not regard the concept of *basic assumptions* as a manifestation of culture, as it can be seen from his model of culture in figure 2.9.

### **2.15 Dimensions for distinguishing between cultures**

This section describes Hofstede's (1994) and Trompenaars's (1994) dimensions for distinguishing between different national and organisational cultures. A dimension, according



to Hofstede (1994), *“is an aspect of culture that can be measured relative to other cultures”*. *“Every culture distinguishes itself from others by the specific solutions it chooses to certain problems”* (Hofstede 1994, Trompenaars 1994). These basic problem areas correspond to the dimensions that Hofstede (1994) and Trompenaars (1994) have chosen to differentiate and understand between various national and organisational cultures.

### 2.15.1 Comparing different national cultures

In this section, I only discuss Hofstede's and Trompenaars's dimensions for comparing different national cultures, as discusses earlier and shown in figure 2.7.

Hofstede (1994) defines 5 dimensions to differentiate between national cultures: (1) power distance; (2) individualism-collectivism; (3) masculinity-femininity; (4) uncertainty avoidance and (5) long-short term orientation.

1. *“Power distance informs us about ‘dependence relationships’ in a country”*. It measures how subordinates respond to authority. In other words, the degree of inequality among people which the population of a country considers as normal; from relatively equal (small power distance) to extremely unequal (large power distance) (Hofstede, 1994).
2. Individualism versus collectivism refers to the degree to which people in a country prefer to act as individuals rather than as members of groups (Hofstede, 1994). *“Individualism pertains to societies in which the ties between individuals are loose: everyone is expected to look after him/her self and his or her immediate family. Collectivism as its opposite pertains to societies in which people from birth onwards are integrated into strong, cohesive in-groups, which throughout people's lifetime continues to protect them in exchange for unquestioning loyalty”*.
3. The Masculinity versus femininity dimension is discussed whereby *“masculinity pertains to societies in which social gender roles are clearly distinct (i.e. men are supposed to be assertive, tough and focused on material success whereas women are supposed to be modest, tender and concerned with the quality of life)”*. *“Femininity pertains to societies in which social gender roles overlap (i.e. both men and women are supposed to be modest, tender and concerned with the quality of life)”*. According to Hofstede (1994) women's roles differ from men's roles in all countries, but in tough societies the differences are larger than in the tender ones. So, in simple words, a country has a high



female index if the female goals are valued and a high male index if the female goals are less valued.

4. Uncertainty avoidance can be defined as the “*extent to which the member of a culture feel threatened by uncertain or unknown situations*”. In countries that score high on uncertainty avoidance people tend to show more nervous energy, while in countries that score low, people are more easy going (Hofstede, 1994).
5. Long/short-term orientation refers to the degree to which countries are oriented towards practice and the search for virtuous behaviour or towards belief and the search for truth. “*Long-term orientation manifests itself by values like persistence, ordering relationships by status and observing this order, thrift and having a sense of shame*”. In contrast, “*short-term orientation manifests itself by values like personal steadiness and stability, protecting your ‘face’, respect for tradition and reciprocating of greeting, favours and gifts*”.

Trompenaars’s (1994) 7 dimensions for differentiating national cultures are grouped under 3 headings: (1) those which arise from our relationships with other people; (2) those which come from the passage of time; and (3) those which relate to the environment.

#### 1. Relationships with people

There are five orientations that cover how human beings deal with each other (Trompenaars, 1994):

##### i. Universalism versus particularism

“*The universalist approach is roughly: ‘What is good and right can be defined and always applies’ whereas in particularist cultures far greater attention is given to the obligations of relationships and unique circumstances*”. For example, Trompenaars (1994) asserts “*that at the universalism extreme we come across an obligation to adhere to standards, which are universally agreed to by a culture*”. “*At the particularism extreme we encounter particular obligations to people we know*”

##### ii. Individualism versus collectivism

Individualism has been described by Parsons & Kroeber (1958) as “*a prime orientation to self*” and collectivism as “*a prime orientation to common goals and objectives*”. According to Trompenaars (1994), this dimension refers to questions like “*conflict between what each of us wants as an individual, and the interests of a group*”



*we belong to". He asks the questions "Do people regard themselves primarily as individuals or primarily as part of a group?" and "is it more important to focus on individuals so that they can contribute to the collective as and if they wish, or is it more important to consider the collective first since that is shared by many individuals?"*.

iii. Neutral or emotional

Individuals belonging to a neutral culture do not express their feelings but control them and keep them subdued (Trompenaars, 1994). On the contrary, individuals belonging to an emotional culture show their feelings *"they attempt to find immediate outlets for their feelings"*. According to Trompenaars (1994), in some countries *"business relationships are typically instrumental and all about achieving objectives and the assumption is that we should resemble our machines in order to operate them more efficiently"*. In contrast, *"in many other cultures, business is a human affair and the whole range of emotions are considered appropriate"*.

iv. Specific versus diffuse

*"When the whole person is involved in a business relationship there is a real and personal contact, instead of the specific relationship prescribed by a contract and in many countries a diffuse relationship is not preferred, but necessary before business can proceed"*. According to Trompenaars, *"it is important to learn that to do business in particular countries, it involves more than overwhelming the customer with technical details and fancy slides"*.

v. Achievement versus ascription

*"Achievement means that you are judged on what you have recently accomplished and on your record whereas ascription means that status is attributed to you, by birth, kinship, gender or age, but also by your connections (who you know) and your educational record"*. He adds to this by suggesting that the 'achieved' status refers to 'doing' whereas the "ascribed" refers to "being" (Trompenaars, 1994).

2. Attitudes to time

*"The way in which societies look at time also differs"*, and in some societies the achievements of an individual are not important. Rather, it is more important to know their future plans, whereas in other societies your past accomplishments are more important than today's (Trompenaars, 1994). In addition, *"it is about the relative importance cultures give to the past, present and future, especially important is whether our view of time is sequential, a*



*series of passing events, or whether it is synchronic, with past, present and future all interrelated so that ideas about the future and memories of the past both shape present action”.*

### 3. Attitudes to the environment

According to Trompenaars, another cultural difference can be found in the attitude of cultures towards the environment. *“Some cultures see the major focus affecting their lives and the origins of vice and virtue as residing within the person and so here, motivations and values are derived from within”.* These cultures act against the environment. In contrast, cultures that act with the environment are *“cultures that see the world as more powerful than individuals and see nature as something to be feared or emulated”* (Trompenaars, 1994). According to Trompenaars, the former cultures are inner-directed and the latter, outer-directed. The inner-directed cultures tend to behave with the belief that they can control the environment, whereas the outer-directed ones prefer not to resist and compromise.

Generally, the dimensions of the one author can be mapped on to the dimensions of the other author. Although Hofstede’s (1994) and Trompenaars’s (1994) dimensions differ somewhat in structure and terminology, their underlying ideas correspond. For example, Hofstede’s (1994) *masculinity versus femininity* dimension corresponds to Trompenaars’s (1994) *universalism versus particularism* dimension. This conclusion can be reached because universalist cultures have similar characteristics with masculine cultures. In the same way, particularist cultures are similar to feminine cultures. This point, however, does not imply that they are the same but that they just share certain characteristics. The only dimension on which Hofstede and Trompenaars agree on terminology and content is the *individualism versus collectivism* dimension.

#### 2.15.2 Comparing different organisational cultures

Hofstede (1994) defines 6 dimensions to distinguish between different organisational cultures. These are (1) process versus results oriented; (2) employee versus job oriented; (3) parochial versus professional (4) open versus closed systems of communication; (5) loose versus tight control and (6) normative versus pragmatic.

1. The process-versus-results oriented dimension *“opposes a concern with means (process oriented) to a concern with goals (results oriented)”*. In process-oriented cultures people avoid risks and make only a limited effort in their jobs, and each day is relatively the same (Hofstede, 1994). In results-oriented cultures, people are comfortable in unfamiliar



situations, put in a maximal effort in their job, and each day feels that it brings new challenges (Hofstede, 1994).

2. The employee-versus-job oriented dimension *“opposes a concern for people (employee oriented) to a concern for completing the job (job oriented)”* (Hofstede, 1994). Hofstede found that in the employee-oriented cultures *“people feel their personal problems are taken into account, that the organisation takes a responsibility for employee welfare, and that important decisions tend to be made by groups or committees”*. In contrast, in the job-oriented units, *“people experience a strong pressure to complete the job, they perceive the company as being interested only in the work employees do, not in their personal and family welfare, and report that important decisions tend to be made by individuals”* (Hofstede, 1994).
3. The parochial-versus-professional dimension *“opposes units whose employees derive their identity largely from the organisation (parochial) to units in which people identify with their type of job (professional)”* (Hofstede, 1994). Furthermore, he found that the members of parochial cultures felt that the *“organisation’s norms cover their behaviour at home as well as on the job. They feel that in hiring employees the company takes their social and family background into account as much as their job competence, and they do look far into the future”*. On the other side, members of professional cultures consider their *“private lives their own business, they feel the organisation hires on the basis of job competence only, and they do think far ahead”* (Hofstede, 1994).
4. This dimension opposes open systems to closed systems. Hofstede (1994) argues that *“in the open system units’ members consider both the organisation and its people open to newcomers and outsiders, almost anyone would fit into the organisation and new employees need only a few days to feel at home. In the closed system units, the organisation and its people are felt to be closed and discrete even among insiders, only very special people fit into the organisation, and new employees need more than a year to feel at home”* (Hofstede, 1994).
5. The loose-versus-tight control dimension refers to *“the amount of internal structuring in the organisation”* (Hofstede, 1994). People in loose control units feel that *“no one thinks of cost, meeting times are only kept approximately and jokes about the company and the job are frequent. People in tight control units describe their work environment as cost-conscious, meeting times are kept punctually and jokes about the company and/or the job are rare”*.



6. The normative-versus-pragmatic dimension deals with the popular notion of '*customer orientation*' (Hofstede, 1994). According to Hofstede (1994), pragmatic units are '*market driven*'; normative units "*perceive their task towards the outside world as the implementation of inviolable rules. Whereas in the normative units the major emphasis is on correctly following organisational procedures, which are more important than results; in matters of business ethics and honesty, the unit's standards are felt to be high*". In the pragmatic units, there is "*a major emphasis on meeting the customer's needs, results are more important than correct procedures and in matters of business ethics, a pragmatic rather than a dogmatic attitude prevails*".

Trompenaars (1994) found two dimensions to distinguish between different organisational cultures. These are: (1) equality - hierarchy and (2) orientation to the person - orientation to the task. Hofstede argues that these 2 dimensions need to be considered as generating four quadrants. This, according to Trompenaars (1994) "*enables us to define four types of organisational cultures, which vary considerably in how they think and learn, how they change and how they motivate, reward and resolve conflicts*". In this section, I will only describe the two dimensions for distinguishing different cultures, and not on the different types of organisational cultures, as they are beyond the focus of this thesis.

1. The *equality - hierarchy dimension* refers to the amount of equality in expense of hierarchy within an organisation.
2. The *orientation to the person – orientation to the task dimension* refers to the extent an organisation is more interested in the persons doing a task, as opposed to the actual task itself.

Trompenaars's (1994) two dimensions can be linked to Hofstede's (1994) six dimensions. For example, Trompenaars's (1994) *orientation to the person – orientation to the task dimension* is very similar to Hofstede's (1994) *employee versus results dimensions*. Both dimensions refer to the degree a company is more interested in its employees rather than the job they do. According to both, organisations either tend to believe that by treating their employees as their best asset, the job they perform will be of the best possible quality. Conversely, organisations tend to concentrate on the job the employees do and how well they do it, rather than on the employees themselves. Another example is the *equality – hierarchy dimension*, which is similar to Hofstede's *loose versus tight control*. Both dimensions refer to level of control and hierarchy within organisations.



Therefore, it can be argued that Hofstede's dimensions provide more insight into the organisational culture of a company. Two of Hofstede's dimensions are the same as Trompenaars's. Additionally, he offers 4 more to help us understand and differentiate between organisational cultures.

All the aforementioned dimensions can be very useful if someone aims to understand and compare different cultures. However, they do not provide any guidelines on what to do when implementing ERP systems in different national or organisational cultures.

## **2.16 Summary and chapter conclusions**

ERP (Enterprise Resource Planning) software packages are an essential part of enterprise-wide information systems. An ERP package, such as SAP's R/3, is a large off-the-shelf software solution which provides integrated business and software systems to a customer.

Research into ERP systems implementations has recognised the failure to deliver projects on time and within budget. To tackle those challenges ERP implementation methodologies have been strengthened and the importance of several Critical Success Factors (CSF) has been emphasised. However, these improvements do not recognise the importance of culture on ERP implementation projects. Moreover, current ERP implementation methodologies do not elicit evidence of the national and the organisational culture of a company implementing an ERP package and they fail to provide a methodology on how to handle culture-related issues. Companies implementing ERP systems face and will continue to face such important challenges if the impact of organisational and national culture is not appreciated.

Research into national and organisational culture has mainly taken place in the psychology, management, sociology, organisational theory and human resources management disciplines. It focuses primarily on what culture is, how it can be identified, and how someone can separate one culture from another. There is a wide variety of views and approaches. Not all of them are relevant to ERP implementations and also do not deal with the culture-related issues. Research into the area of culture has made no serious attempt to tackle culture-related issues in ERP implementation due to the lack of overlapping discipline interests. However, there is an enormous potential of exploiting this research and relating it to ERP implementations.



If more ERP implementations are to deliver their promised benefits within budget, and if ERP vendors are to regain their lost market share, we need to understand how organisational and national culture impact on ERP implementations, and how this understanding will deliver better software solutions and methods for ERP vendors, implementation partners and customers to use.

The remaining chapters of this thesis describe the research and studies that contributed to the development of a method to help identify, explain and predict culture-related problems in future ERP implementations. In the following chapter, a theory of culture for ERP implementations is presented to provide a theoretical basis for developing such a method.



## **Chapter 3**

### **A Theory of Culture for ERP Implementations**

This chapter describes theories and models of culture for ERP implementations



## Chapter 3

### A Theory of Culture for ERP Implementations

#### 3.1 Introduction

A key component of this thesis is a theory of national and organisational cultures on ERP implementations. As demonstrated in the previous chapter, information and enterprise systems theories and models do not incorporate cultural manifestations and characteristics. In the same way, social and management science theories, or theories of culture, do not deal with information and enterprise systems. In this chapter, I present a new theory that defines culture and describes and explains the key manifestations of national and organisational culture that are critical in ERP implementations. The theory introduces a descriptive model that can be instantiated to produce model fragments that describe and explain culture-related problems in ERP implementations. The theory does not aim for a complete coverage of all ERP implementation issues. Instead, it aims for the more realistic objective of covering a set of issues that relate to the general activities associated with an ERP implementation and the usage of the resulting ERP system.

The theory has been developed to investigate hypotheses H2, H3 and H4 of the thesis:

- H2 Social and management science theories and models can be integrated and progressed to develop a descriptive model of some of the key manifestations of national and organisational culture that are critical to ERP implementations.
- H3 Social and management science theories can be extended to produce models that accurately describe the culture-related problems observed in current ERP implementations.
- H4 Social and management science theories can be extended to produce models that can be applied to explain the reason behind the culture-related problems arising from ERP implementations.



## 3.2 Overview of the theory

The theory of culture for ERP implementations presented in this chapter adopts, integrates and extends existing theories and models of culture to explore its impact on ERP implementations. The main components of the theory, and the process by which they were established, are shown in figure 3.1. Each of the different parts of the theory is denoted with a letter (A to H) in the text to facilitate its reference with the figure 3.1.

The integrated theory and models (C) derived by integrating the existing approaches of the key scholars in the area of culture (A). These synthesised theories and models (C) are combined together with key concepts of ERP implementations, and extended with methods and tools from the computer science field (B). The outcome of this integration is a model of culture (D) that includes the key manifestations of culture and of ERP implementations, as well as an indication of how easily they can be identified and how significant they are in understanding a culture and its impact on an organisational change.

The model of culture (D) was further extended using the synthesised social and management science theories and models of culture (C). The result was a schema of culture, which includes the manifestations of culture and their inter-relationships (E). From the existing theories of computer science, ERP systems and requirements engineering I developed a corresponding schema of ERP and information systems implementations (F). This schema includes key manifestations of ERP/IS implementations and their inter-relationships. The two aforementioned schemas (E & F) were then integrated to form a meta-schema of culture for ERP implementations (G).

In order to facilitate the selection of the key manifestations from the met-schema (G), I re-introduced the model of culture (D). As a result, I was able to produce instantiations of the meta-schema (H), which incorporate the key manifestations of culture and ERP implementations, together with their inter-relationships.

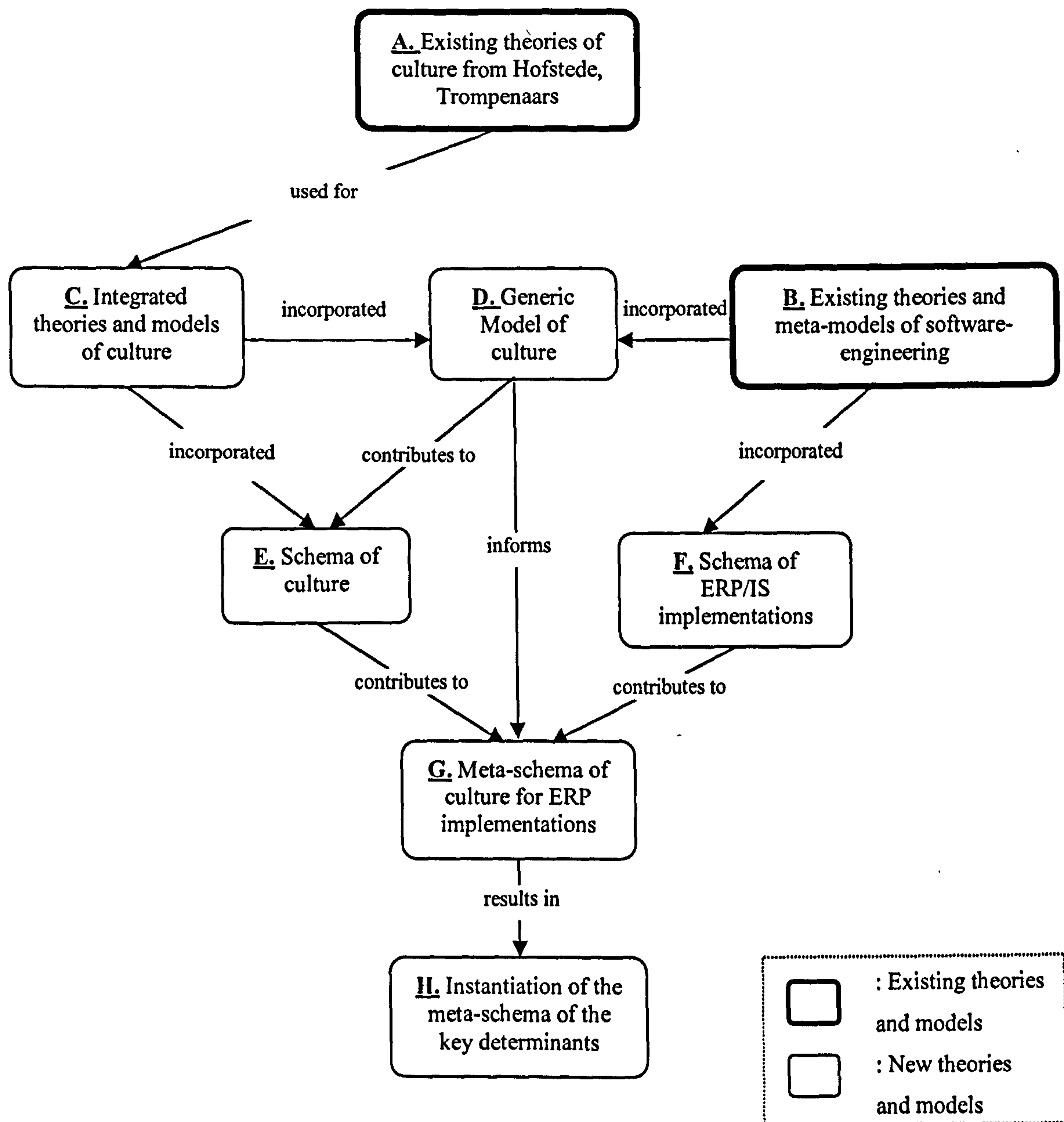


Fig. 3.1: Overview of the components of the theory of culture for ERP implementations and the procedure by which they were established

### 3.3 Theory and models of culture for ERP implementations

In this section I present the theory and models of culture for ERP implementations. First of all, I discuss the approach adopted to national and organisational culture. Subsequently, I define culture and introduce 2 models that describe the concept of culture for ERP implementations.



### **3.3.1 The selected levels of culture**

The theory is restricted to national and organisational culture only. Firstly, at the early stages of this research, these two levels seemed to have the greatest impact on ERP implementations. Secondly, the third level of culture, sub-cultures, gives rise to other areas which are outside the scope of this thesis.

### **3.3.2 The selected approaches for organisational and national culture**

Researchers adopt different approaches for each of these two levels of culture, as discussed in chapter 2. National culture can be viewed, according to Herkenhoff (2000), as a holistic, a variable or a cognitive approach. Likewise, organisational culture can be viewed, according to Scott (1995), using the metaphor, or the inside or the outside approach. The theory of culture discussed in this chapter draws from the cognitive approach for national culture, and the outside approach for organisational culture.

The cognitive approach for national culture was chosen for the following 3 reasons:

1. This approach uses norms, beliefs and values in order to provide and explain the standard of acceptable behaviour of one or more members of a culture. Under this approach, beliefs, norms and values are the essence of national culture (Herkenhoff, 2000) and this facilitates the explanation of individual and collective acceptable behaviour. The other 2 approaches, as discussed in chapter 2, do not facilitate such an explanation of behaviour. The holistic approach is too broad (Munro et al. 1997), and the variable approach concentrates on the behaviours of individuals only (Herkenhoff, 2000).
2. Hofstede (1994) and Trompenaars (1994) are considered to be two of the most established researchers into culture and both view culture using the cognitive approach. Thus, by choosing this approach this thesis adopts leading-edge research in the field.
3. Moreover, under this approach, national culture refers to the perceptions that enable an individual to behave in a certain way (Verbeke et al. 1998). The knowledge from these perceptions provides a standard of acceptable behaviour within a specific national culture, which can facilitate in predicting the behaviour of the members of a culture.

The outside approach for organisational culture was adopted for the following 3 reasons:

1. The outside view on culture is more concerned with cross-cultural comparisons and inter-cultural communication issues than the other approaches for organisational culture. These issues are very relevant to this research because I aim to test whether different organisational cultures have an impact on ERP implementations (H1). Hence, appreciating these differences and considering them in the implementation methodologies when employing an ERP in different organisations has the potential to be useful.
2. Researchers who view culture as an outside variable believe that organisational culture is something that starts and is established through its members. For this reason culture can also change through its members. This view fits in the research of this thesis because it emphasises the importance of the members of an organisation and their influence on the organisational culture. This aspect of the outside approach indicates that these cross-cultural differences among organisations are reflected through its members. An organisational culture can accept the ERP system and change as a result of it being adopted when the members of this culture accept it.
3. The work of Trompenaars (1994) and Hofstede (1994) adopts the outside approach for culture. Both researchers' work has been highly accepted by other scholars in the field, and many researchers have followed their theories and models. This provides some guarantee towards the reliability of the research in this thesis.

### **3.3.3 A generic definition of culture**

In this section I present a definition of culture relevant to ERP implementations as a starting point for the theory. The definition is generic in the sense that it applies to both national and organisational culture, and comprises concepts of both Trompenaars's (1994) and Hofstede's (1994) definitions of culture. It is independent of ERP implementations because, before the ERP implementation takes place, a culture is already formed, and the shared values, beliefs and norms have already been established. These established values, beliefs and norms are the manifestations of a culture that can impact on the implementation of the ERP.

In this thesis I define the culture of a group as:

*"The shared values, norms, and beliefs of a given group cultivated for the attainment of a specific goal. These shared manifestations provide the standard of acceptable behaviour within this group, which distinguishes it from another"*  
(Krumbholz, 2002).



The above definition of culture is decomposed, in order to demonstrate why and how it is an integration of the definitions by Hofstede and Trompenaars.

Hofstede (1994) defines national culture as:

*“... the collective programming of the mind which distinguishes the inhabitants of one country from another”*

Similarly Hofstede (1994) defines organisational culture as:

*“... the collective programming of the mind which distinguishes the members of one organisation from another”*

Trompenaars (1994) defines national culture as:

*“... the way in which a group of people solves problems. It is the concrete, observable things like language, food, or dress”*

Likewise, Trompenaars (1994) defines organisational culture as:

*“... the way in which attitudes are expressed within a specific organisation”*

Hofstede (1994) sees both national and organisational culture as *“the collective programming of the mind”* that the members of a culture possess, and distinguish them from another culture. The term *“collective programming of the mind”*, according to Hofstede, refers to the way members of a culture organise their shared values, beliefs and norms. The way that these manifestations are organised forms the *‘standard of acceptable behaviour’* that I am using in my definition of culture. Hence, I argue that my definition of culture borrows from Hofstede the concept of *shared values, beliefs and norms of a given group*, which creates the *standard of acceptable behaviour* that Hofstede names as *“collective programming of the mind”*. Furthermore, my definition also uses the notion that this *standard of acceptable behaviour* is what differentiates one group from another.

Trompenaars (1994) states that a system of shared meanings exists because it is the way in which a group of people (a culture) solves problems. This concept is integrated into my definition of a culture as it provides the purpose as to why a culture is formed. Values, norms and beliefs are the manifestations of culture that guide the behaviour of the members of a

culture. These manifestations develop when a culture is trying to achieve a goal, or is trying to find the solution to a problem. The way that the members of a culture arrive at a solution becomes accepted as shared values, norms and beliefs and in turn drives their behaviour.

### 3.3.4 A generic model of culture

The generic definition of culture bounds how culture is used in this thesis. However, it does not provide a detailed description of culture and how it is related to ERP implementations. Consequently, we need a model that describes the concept of culture for ERP implementations based on the models of culture from the cognitive approach for national culture and from the outside approach for organisational culture.

Both Hofstede (1994) and Trompenaars (1994) offer models of culture that belong to the chosen approaches. They both use the graphical representation of an “*onion model*” to describe culture, as discussed in chapter 2. Each scholar’s “*onion model*” is comprised of a number of manifestations of culture, laid out in the different layers of the “*onion*”. On the outer layers are manifestations of culture that are directly visible and easy to identify and are prone to change. Moving towards the core of the “*onion*”, the manifestations become less and less visible, more difficult to identify and are hard to change. For this reason, the manifestations towards the core of the model are characterised as implicit, whereas the manifestations towards the outermost layer are characterised as explicit.

Hofstede’s and Trompenaars’s models of culture, for obvious reasons, do not include any manifestations or concepts of ERP implementations. Hence, in order to create a model that is applicable to ERP implementations, new manifestations needed to be added. Some of these manifestations come from the existing theories of culture, in order to make the model of culture more complete. Others originated from the computer science and ERP theories, so as to make the model appropriate for ERP/IS systems implementations. The resulting model, called *generic model of culture*, is my version of a model of culture applicable to ERP implementations. It is depicted in figure 3.2.

The generic model of culture comprises of manifestations of culture as well as concepts of ERP/IS implementations. Moreover, it reveals the level of “*implicitness*” of each of the manifestations. The outer layers include manifestations that are more explicit to the observer. The manifestations at the core of the model of culture are the most implicit ones to an outsider, with the rest of the manifestations in-between. The outer layers of the model contain the manifestations of culture that are observable by someone outside a culture. However, their



meaning is not, and can only be explained by an insider, a member of this culture. The core of the model contains the most implicit manifestations of culture that are unconscious, and can only be inferred from the way members of a certain culture act under a specific situation. The outer layers serve as manifestations of culture, which portray the core of the model, with the most implicit manifestations. Only by “unravelling” the outer layers can we understand the core more easily.

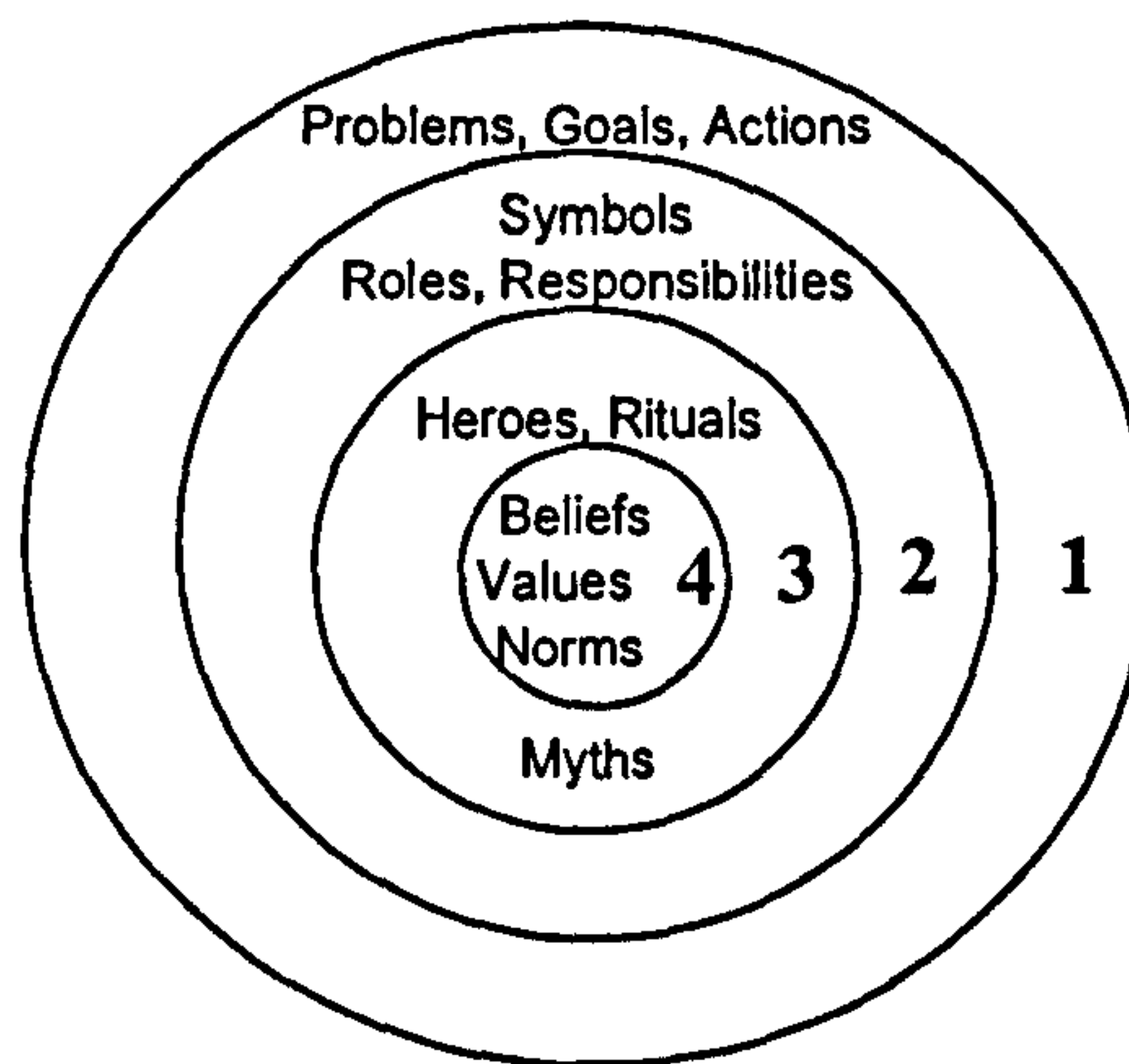


Fig 3.2: A generic model of culture for ERP implementations; it consists of a number of manifestations of culture as well as concepts from ERP / IS systems' implementations. All these manifestations are layered according to their level of implicitness. (Please note that in order to facilitate the description of the manifestations, each layer is numbered)

There are 12 manifestations included in the generic model of culture for ERP implementations described from the outermost layer (number 1 in figure 3.2) and proceeding to the succeeding layers, one by one until the core is reached (number 4 in figure 3.2).

#### 3.3.4.1 Layer 1

The outermost layer consists of 3 manifestations - problems, goals and actions. All 3 manifestations are explicit because an observer of a culture can easily identify them. Moreover, these 3 manifestations are positioned in this layer because they can easily change and be replaced by new ones.

#### Problems

Problems are situations that delay or prevent the attainment of a goal. They are one or more obstacles that an individual or a group of people of a certain culture might face when trying to achieve one or more goals (Darimont & Van Lamsweerde, 1996). These situations require attention with the aim of finding a solution. In this thesis, with problems I refer to those situations or issues that arise as a result of an ERP implementation in a specific organisation,

based in a specific country. For instance, the problem ‘the new ERP system requires a lot of administrative work’ relates to the specific organisation, in the specific country it was elicited.

### Goals

A goal is a high-level objective that the system should meet and is achieved through actions performed by agents manipulating one or more objects (Darimont & Van Lamsweerde, 1997). One or more actions can achieve one or more goals. In the case of an ERP implementation, the object is the actual ERP system and the goal is closely related to the execution of an action in order to achieve this specific goal. For example, the goal ‘day-to-day warehouse activities to be more efficient’ relates to an agent (e.g. warehouse personnel) performing an action (e.g. administrative work) by using an object (e.g. SAP’s R/3) in order to achieve this goal.

### Actions

An action is the process of doing something with the intention of achieving a desired goal (Maiden et al. 1998). Actions, in this thesis, are undertaken by members of a culture who do something related to their job through the use of the new ERP system. For example the action ‘dealing with customer enquiries and requests’ relates to an agent (e.g. personnel in the customer services department) performing this in order to achieve a goal (e.g. quick and successful responses to the customers).

Moreover, an agent can have a reaction to an action, depending on his values and beliefs. An agent can have one or more reactions to one or more actions. Consider a person – agent - who applies for a promotion and is rejected. This person - agent - might either react by working really hard with the intention to try again for a promotion, or s/he might react by losing interest and not work so hard. The reaction is influenced by the agent’s values and beliefs.

#### 3.3.4.2 Layer 2

The second layer consists of 3 manifestations; symbols, roles and responsibilities. These 3 manifestations are positioned in this layer, because they are explicit and hence easily observable by outsiders of a culture and prone to change, though less so than the manifestations included in the previous layer. For instance, somebody might be able to recognise who fulfils what role and which responsibilities in a culture, but they would be less likely to understand what this means for that culture and why. Moreover, someone might be able to recognise the symbols of a culture, but s/he would not be able to understand, interpret



or explain them in the same way as someone from inside the culture (Hofstede, 1994). *“They are visible to an outside observer; their cultural meaning, however, is invisible and lies precisely and only in the way these symbols are interpreted by the insiders”* (Hofstede, 1994).

### Symbols

Symbols are objects explicit to people outside the organisation that are manifestations of the organisation’s beliefs, norms and values (Hofstede, 1994). One or more symbols depict one or more values, beliefs and/or norms. Symbols can be from a simple gesture, or a phrase, to a building, a cloth, a hairstyle or food (Hofstede, 1994). Symbols are created or changed as a culture evolves. Trompenaars (1994) uses the words “artefacts” and “products” instead of symbols. He states that *“they mirror how an outsider would perceive the culture to be as they are the observable reality of the language, food, buildings, etc, they are the symbols of the other more implicit levels of culture, the norms, values and the basic assumptions”* (Trompenaars, 1994). It is assumed that Hofstede’s symbols, and Trompenaars’s artefacts and products refer to the same manifestation, as discussed in chapter 2.

### Roles

One or more roles define the obligations of one or more agents or heroes within a certain culture. Different roles in different cultures have different meanings. A certain role within one culture may be perceived in a different way to another culture. For example, the role of IT support within a certain organisation that implements an ERP, may have a different significance to another organisation. This can be attributed to cultural differences.

### Responsibilities

Responsibilities define the obligations of the agents and the heroes that are associated with the roles that they perform. Agents are responsible for fulfilling a role and initiating, controlling or undertaking actions related to their role (Maiden et al. 1998). One or more agents can have one or more responsibilities associated with one or more roles. Responsibilities provide information about a role of an agent and how it is perceived by the culture that this agent belongs to.

#### 3.3.4.3 Layer 3

This layer includes the manifestations heroes, rituals and myths as manifestations because they are more implicit and hence, difficult, for an observer of a culture to identify. They are also more difficult to change within a culture (Hofstede, 1994). Someone outside a culture

would find it difficult to recognise a hero, a myth or a ritual of a culture, and even if s/he did, it would be very hard to understand what it means to that culture and why.

### Heroes

A hero is a human agent who is admired by other agents in the organisation (Deal & Kennedy, 1982). One or more heroes are one or more agents that, through their role and responsibilities, undertake one or more actions. These actions reflect one or more of the beliefs, norms and values of a culture. The other members of a culture see the heroes as their role models, as they are a reflection of the culture's standards of acceptable behaviour. *"These people personify the culture's values and as such provide tangible role models for employees to follow"* (Deal & Kennedy, 1982). Heroes, in general, reflect a culture's characteristics in the most natural way. *"Heroes are persons who possess characteristics which are highly prized in a culture and hence serve as role models of behaviour, who might be dead or alive, real or imaginary, for example movie stars, singers, etc"* (Hofstede, 1994).

### Rituals

A ritual is a repeated action or scenario that expresses and is influenced by one or more beliefs and values of a culture (Hofstede 1994, Deal & Kennedy, 1982). One or more rituals dictate behaviour in the form of one or more actions. They are *"systematic and programmed routines of day-to-day life"* in a culture, which show to its members what kind of behaviour is acceptable and is expected of them (Deal & Kennedy, 1982). Rituals are *"collective activities, which have a symbolic rather than a practical meaning"* (Hofstede, 1994) as they emphasise what is important for a culture and what it stands for. Examples of rituals can be training programmes, sales conferences, send-off and Christmas parties. Rituals indicate what the standard of acceptable behaviour is within a certain culture. Rituals, as an manifestation of culture were adopted from Hofstede's model of culture.

### Myths

Myths are scenarios, factual or invented, which encapsulate one or more of the culture's beliefs, norms and values. Myths are *"the stories told between the members of a culture, to outsiders, to new members, etc. that embed the present in its history and also flag up important events and personalities"* (Johnson & Scholes, 1992). Myths reveal a lot about a culture's values and beliefs, rules and procedures, power structure, and the consequences of the rules (Brown, 1995).



#### 3.3.4.4 Layer 4 - the core

This layer of culture consists of 3 concepts; beliefs, values and norms. These are the most implicit and difficult-to-change manifestations of culture because we adopt them in the very early stages of our lives in a culture that most of them remain unconscious (Hofstede, 1994). Therefore, values, beliefs and norms that people hold cannot be discussed or directly observed. Instead, they can only be inferred by an outsider from the way these people act under different circumstances (Hofstede, 1994). For these reasons, they are placed in the core of the generic model of culture.

##### Norms

A norm is a standard expectation of normal behaviour including what is right or wrong in a particular context (Hofstede 1994, Trompenaars 1994). A norm, in this context, is for example, an agent's expectation of the new system. Within a social grouping, it is a kind of behaviour that all the members of the group expect in a certain context and influence one or more of their values (Bach & Harnish, 1979).

##### Beliefs

A belief is a mental state held by an agent about a particular proposition. In this context, a belief, for example, can be the opinion or rationale of an agent about a specific expectation. According to Schein (1985), one or more beliefs are influenced by one or more values and are issues that individuals can recognise and discuss. This could be their opinion on a specific subject area, such as '*service to the community*'. One or more beliefs influence one or more agents; they are dispositions to act (Engel 1984, Quine 1970). Hofstede and Trompenaars do not include beliefs in their models of culture. However, I introduce them in the generic model of culture because they provide the explanation for what a culture expects or considers as normal.

##### Values

A value is a special kind of belief; it is a belief that is relatively less "*vulnerable to removal*" (Levi, 1984) i.e. it is more persistent or entrenched (Gardenfors 1988, Harman 1986). A value underpins the worth or importance of an agent about a norm. Values provide the spectrums of belief about good versus evil or normal versus abnormal (Hofstede 1994, Schein 1985).

### 3.4 A meta-schema of culture

The generic model of culture provides a comprehensive reference of the manifestations of culture critical to ERP implementations. However, the model has the following limitations:

1. The generic model of culture does not include all necessary critical concepts from the computer science, ERP implementations and requirements engineering
2. The model does not explicitly define the inter-relationships between the different manifestations of culture and IS/ERP implementations, thus diminishing our understanding of how culture affects ERP implementations

As a result, the need arose for an extension of the model that incorporates the manifestations of culture critical to ERP implementations, as well as the above-mentioned points. The extended model of culture is represented using the meta-schema. The next part of the chapter begins with a presentation of the meta-schema of culture. Subsequently, I discuss the different manifestations that the meta-schema incorporates. In addition, I re-introduce the generic model of culture and discuss its use in relation to the meta-schema.

#### 3.4.1 The meta-schema of culture

The meta-schema of culture derived from an integration of two smaller schemas. The first schema model cultural manifestations and their inter-relationships (schema of culture). The second schema models ERP/IS implementation concepts and their inter-relationships (schema of ERP/IS implementations).

The 2 schemas and the meta-schema are expressed as UML (Unified Modelling Language) class models that an analyst can instantiate to model specific culture situations. In both the schemas and the meta-schema, the cardinalities between the classes are all “one or more” (1..\*).

The concepts that are used in the meta-schema that relate to culture, form the schema of culture, which is presented in figure 3.3. The manifestations included in this schema are some of the manifestations of culture that are also incorporated in the generic model of culture. The difference between this schema and the generic model of culture is that in the latter one, the inter-relationships between the manifestations are also shown.



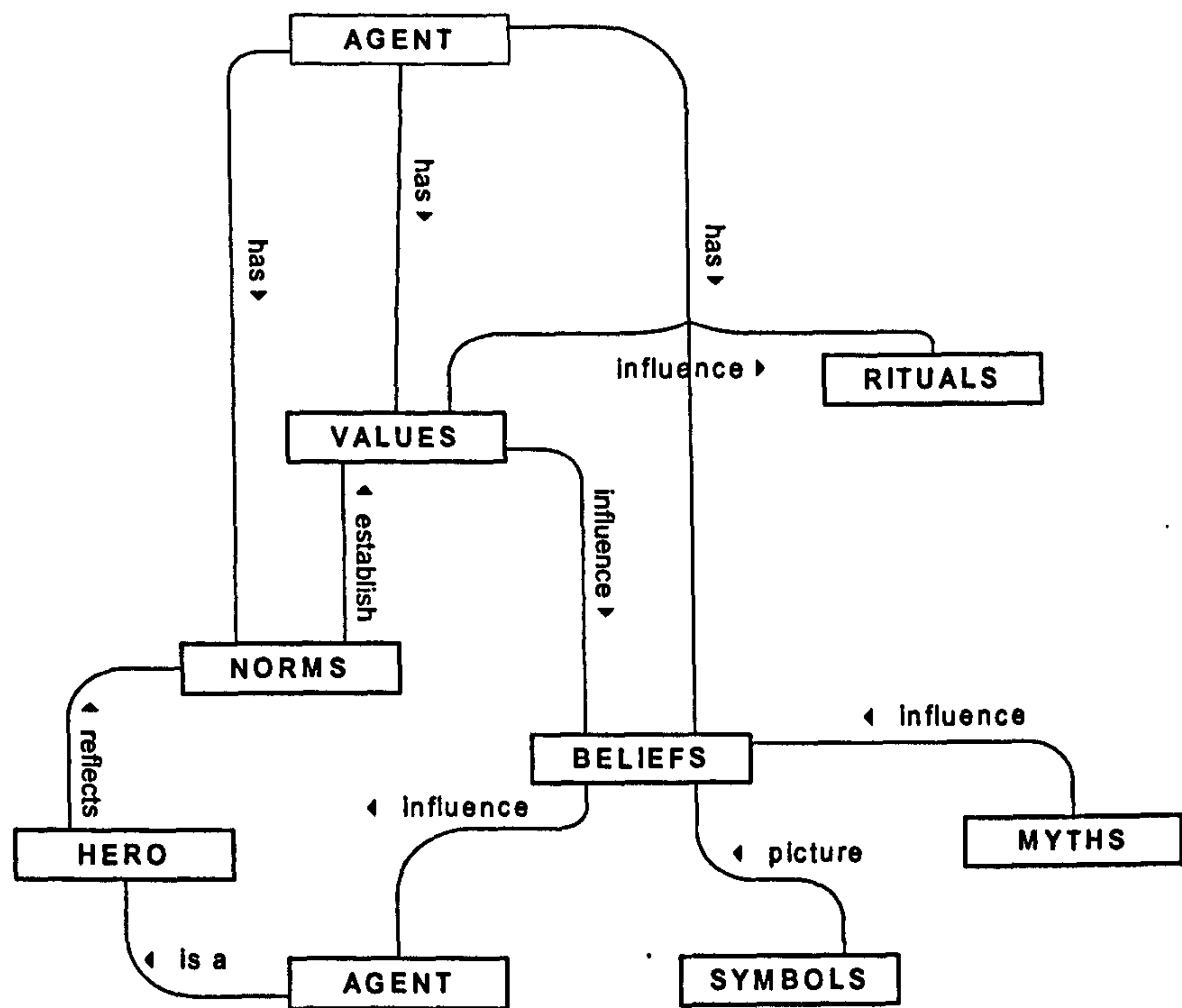


Fig. 3.3: A schema of culture: it includes the key manifestations of culture and their inter-relationships. Please note that the all the cardinalities are all “one or more” (1..\*) and as such, are not depicted in the schema

Whatever concepts in the meta-schema relate to ERP and IS implementations, form the schema of ERP/IS implementations, which is presented in figure 3.4.

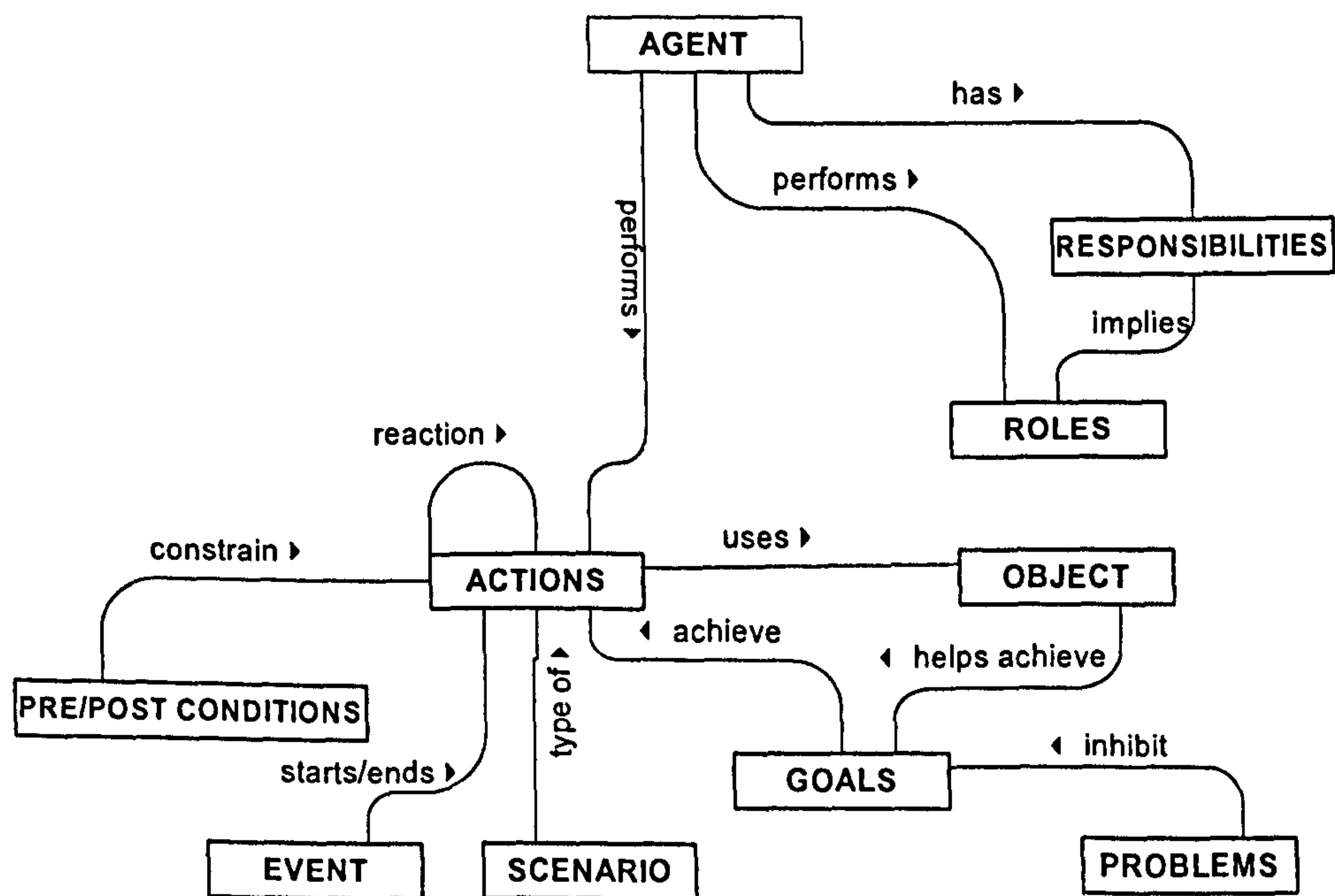


Fig. 3.4: A schema of the concepts of ERP/IS implementations and their inter-relationships. Please note that the all the cardinalities are all “one or more” (1..\*) as such, they are not depicted in the schema

Some of the manifestations included in this schema are also incorporated in the generic model of culture. However, the 2<sup>nd</sup> schema contains some more manifestations that relate to ERP/IS implementations as well as the inter-relationships between all those manifestations. The additional manifestations are derived from theories of systems engineering and requirements engineering. The difference between this schema and the generic model of culture is that the latter one includes some extra manifestations as well as the inter-relationships between all its manifestations.

There are 17 concepts in the meta-schema. Below, I discuss 5 manifestations and their inter-relationships that were not introduced through the generic model of culture, but are included in the meta-schema. The other 12 manifestations and their inter-relationships, included in the meta-schema, were introduced in the section relating to the generic model of culture, and hence were discussed in that section.

### **3.4.2 The additional manifestations incorporated in the meta-schema**

A further 5 elements, drawn from software and business process modelling (e.g. Rosemann et al. 1999), were included in the meta-schema for completeness.

#### Agent

An agent is a type of object which performs or processes actions (Darimont & Van Lamsweerde, 1996). Agents have certain individual features that determine their capabilities of performing actions and achieving a goal (Ncube, 1999). With respect to culture, an agent can have one or more beliefs, values and norms that govern one or more of their actions. One instance of an agent can be one individual person, or a collection of people. For example, an agent can be a person working with the sales and distribution module of the new ERP system. An agent is a manifestation of the meta-schema that is explicit because it is easy to identify.

#### Pre- & post-conditions

Pre- & post-conditions are prerequisites that must occur for an action to begin or end. One or more pre- & post-conditions can constrain one or more actions. For example, a pre-condition for the action of “day-to-day activities in the warehouse” is that the SAP system has been implemented and is live and running. The pre-condition can constrain an action from taking place. Pre- and post-conditions, in this thesis, are regarded as explicit manifestations because they can be identified easily and are prone to change.



### Event

An event is a moment in time when something happens that starts or ends actions (Maiden, 1998). One or more events start or end one or more actions. For example, in relation to the meta-schema, an event can be that “the implementation of R/3 has been completed”. This gives rise to a series of actions that start and end because of the existence of this event. An event, as a manifestation of the meta-schema is considered as explicit because someone outside a culture can easily identify what starts or ends an action.

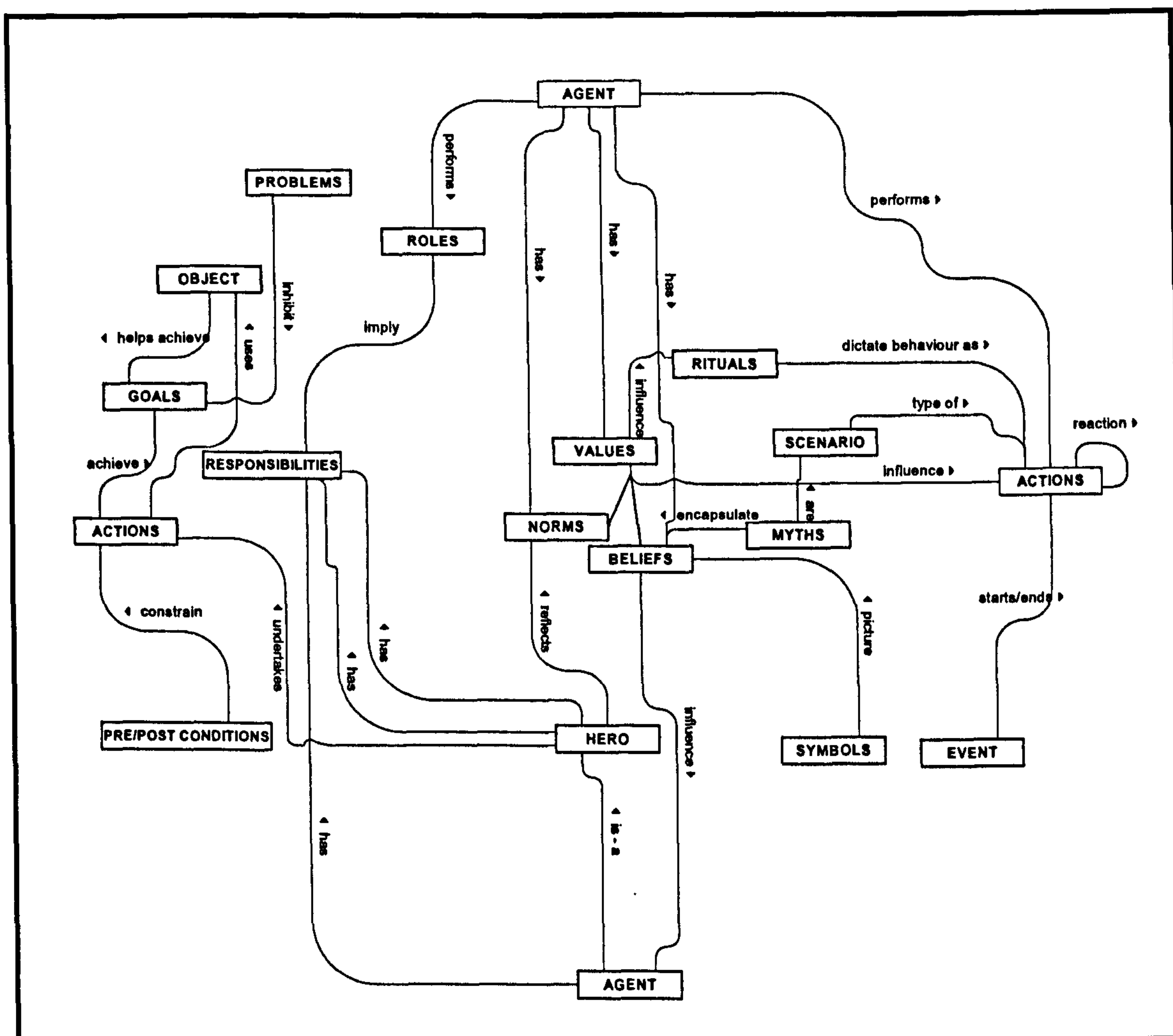
### Object

An object is something which is manipulated for the attainment of a goal. One or more actions manipulate one more objects to achieve a goal. An object can be a physical object (e.g. a radio), an infological object (e.g. information about an incident) or an object with both physical and infological manifestations (e.g. an incident report) (Maiden et al. 1998). An object is an explicit manifestation as an observer of a culture can easily identify it. For example, someone from outside a culture can easily identify which object is used for the attainment of a specific goal (e.g. processing a sales order).

### Scenario

A scenario is a sequence of events that start and end actions and that describe current or future business processes and/or ERP software use (Maiden et al. 1998). Scenarios can describe norms, and can be embellished with contextual information to create stories. An example of a scenario can be the series of events that arise because of the implementation of an ERP system. A scenario as a manifestation of the meta-schema is considered as implicit because it is more complex, difficult to change and hence not easily identifiable from an outsider of a culture.

The synthesised meta-schema of culture, which is the one used for this thesis, is presented in figure 3.5. Each of the manifestations and their inter-relationships, included in the meta-schema of culture, have been defined in their respective sub-section.



**Fig. 3.5: A meta-schema of culture: it is a synthesis of the 2 schemas, the schema of culture and the schema of ERP/IS implementations. It is a descriptive model of the key manifestations of national and organisational culture and of the critical manifestations and concepts of business process models. The meta-schema of culture also demonstrates the inter-relationships between the different manifestations. All the elements incorporated in the meta-schema are critical to ERP/ IS implementations.**

In the following section I discuss the benefits of the generic model of culture for the meta-schema.

### 3.4.3 The benefits of the generic model of culture for the meta-schema

It can be argued that the generic model of culture is just a part of the meta-schema, since all its manifestations are contained within the meta-schema. This argument is true, although there is a fundamental difference between the generic model of culture and the meta-schema. The generic model of culture complements the meta-schema. In order to exploit the benefits of the







to identify them and how easily they can change. Hence, it can be argued that the generic model of culture complements the meta-schema in terms of its ability to expose such features of the manifestations.

2. Guidance: In addition, it demonstrates that in order to identify the implicit manifestations of a culture we first have to understand the more explicit manifestations. By unravelling the outer layers we can untangle the core more easily. The generic model of culture can provide guidance when trying to elicit information about a culture. It can be used in order to formulate strategies for a potential elicitation technique.
3. Instantiation: Finally, and but most importantly, the generic model of culture can assist someone in instantiating the meta-schema. Through instantiation, the meta-schema can represent the key manifestations of a culture. The generic model of culture provides a reference of which manifestations are the critical ones to be elicited. The implicit manifestations, towards the core of the model, provide an explanation of the more explicit ones. They provide a rationale for the existence of the manifestations on the outer layers of the model, and therefore can be argued to be the more critical ones. The meta-schema is represented using UML notations, and hence an instantiation of the different classes and their dependencies is possible.

The chapter ends with a simple example of the meta-schema's application to demonstrate its use and exemplify its key modelling concepts.

#### 3.4.4 An example of the meta-schema

Let us return to the "Hope" example from chapter 2. One instantiation of part of the story is shown in figure 3.7.

Hope was born and is living in a country called Landville and works at the human resources department of a company called Success Plc. (please note that the manifestations of culture are underlined and emboldened). The headquarters of Success Plc. decided to lay off 500 employees as part of an organisational restructuring program (**event**). Hope is the **agent** and the **problem** she has, as part of her job, is to decide the people who are going to be laid off by looking at a number of corrupt employees' records. Her **belief** is that employees who have worked hard should be treated fairly and should not be fired.



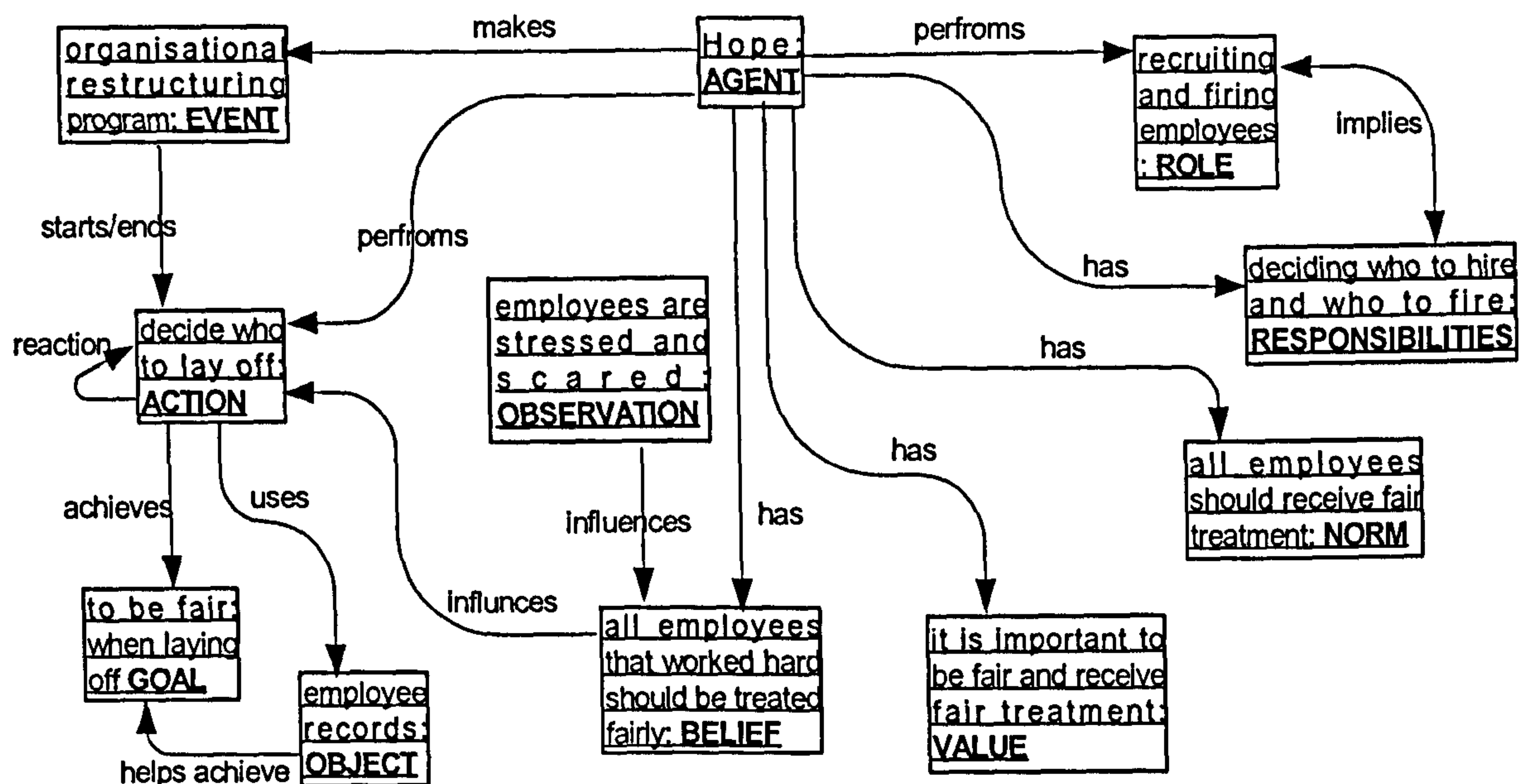


Fig. 3.7: Instantiation of the meta-schema of culture, illustrating the manifestations and their inter-relationships. The instantiation is modelled on the problems the agent faces, which is to select which employees to fire form a number of corrupt employee records.

Hope values fairness as she thinks it is very important to be fair and receive fair treatment. The norm is that all employees who worked hard should receive fair treatment. These values, beliefs and norms will unconsciously influence her actions, whose aim is to achieve her goal, which is to be fair. Her role is to deal with recruiting and firing employees of Success Plc. Part of her responsibilities involve deciding who should get fired. The action she has to perform is to decide who to lay off. She has realised that employees are stressed and scared of losing their job. She will use the object of the corrupt employee records partly to consult her decisions. However, the atmosphere that prevails in Success Plc. and her values, beliefs and norms are also other factors that will influence her decisions. For example, if she thinks that she cannot find 500 employees worth being fired she might react by discussing it with the board of management. She will not discuss with the board of management her beliefs, norms and values, as they are implicit and she might not be fully aware of them, but rather her observations and the corrupt employees' records.

The aim of the aforementioned example is to show how the different manifestations of the meta-schema are related and how they can be interpreted. Moreover, this example demonstrates the usefulness of instantiating the meta-schema of culture. The utility of the generic model of culture as well as of the meta-schema are examined and discussed further in the subsequent chapters.

### **3.5 Summary: a theory of culture for ERP implementations**

The theory describes a set of concepts and models that are derived from integrating the existing approaches by Hofstede (1994) and Trompenaars (1994). These integrated theories and models are conjoined with key concepts of ERP implementations, and are extended with methods and tools from the computer science field. The outcome of this integration is a generic model of culture, which includes the key manifestations of culture and of ERP implementations, as well as their respective level of implicitness. The model of culture was then extended further with the aid of the existing theories on culture. The result was a schema of culture, which is comprised of the manifestations from the generic model of culture and the added manifestations of culture with their inter-relationships. From the existing theories of computer science, ERP systems and requirements engineering I produced a schema of ERP and/or information systems implementations. The two aforementioned schemas were then integrated to form the meta-schema of culture for ERP implementations. The generic model of culture was re-introduced, in order to distinguish between the levels of implicitness for each manifestation included in the meta-schema. Hence, I was able to produce instantiations of the meta-schema, which incorporate only the key determinants of culture and ERP implementations, together with their inter-relationships.

The theory of culture presented in this chapter is the theoretical work undertaken upon which the following 3 hypotheses of the thesis were tested:

- H2 Social and management science theories and models can be integrated and progressed to develop a descriptive model of some of the key manifestations of national and organisational culture that are critical to ERP implementations.
- H3 Social and management science theories can be extended to produce models that accurately describe the culture-related problems observed in current ERP implementations.
- H4 Social and management science theories can be extended to produce models that can be applied to explain the reasons behind the culture-related problems arising from ERP implementations.



The next chapter discusses a preliminary test of hypothesis two (H2). Chapter 5 reports on the empirical testing of the theory of culture for ERP implementations presented in this chapter, and therefore test all of the aforementioned hypotheses.



## **Chapter 4**

### **Preliminary Test of the Theory of Cultural Impact on ERP Implementations**

This chapter describes preliminary studies undertaken to test the theory of culture for ERP implementations

## **Chapter 4**

# **Preliminary Test of the Theory of Cultural Impact on ERP Implementations**

### **4.1 Introduction**

This chapter describes a study carried out at the finance department of a University that had implemented the market leading SAP R/3 ERP product. The main aim of the study was to test the theory presented in chapter 3 and test hypotheses one (H1) and two (H2):

- H1** Organisational and national cultures have a critical impact on the efficiency of ERP implementations
- H2** Social and management science theories and models can be integrated and progressed to develop a descriptive model (meta-schema) of some of the key manifestations of national and organisational culture that are critical to ERP implementations

There is anecdotal evidence that culture has an impact on ERP implementations (Densley 1999, Gulla & Mollan. 1999, Warren 1999), although little knowledge exists about the nature of this impact, and how we can describe and explain it. The theory discussed in chapter 3 aims to describe and explain this impact. The objective of the reported study was to test whether culture does indeed have a critical impact on the efficiency of ERP implementations, and whether the theory can describe this impact.

This chapter is divided into 4 parts. In the first part I present the data gathering and analysis method that was applied in the finance department. In the second part I present the results from this study, I discuss them, and finally draw conclusions.

### **4.2 The data gathering and analysis method**

The data gathering and analysis method was based on the theory discussed in chapter 3 and the elicitation approaches from research into culture (Hofstede 1994, Deal & Kennedy 1982)



and reported knowledge engineering techniques (Maiden et al. 1998). The data gathering and analysis method consisted of 5 parts:

1. Observations	background information about the finance department
2. Interviewee selection	selection factors and final choice
3. Interview questionnaires	a) basic questions, b) SAP implementation c) culture-related questions questions,
4. Conduct of interviews	interviewing process and technique
5. Data analysis	4-staged process

Table 4. 1: The 5 parts of the data gathering and analysis method

Each of these 5 parts is examined in turn.

4.2.1 Observations

The observation technique is a qualitative approach that involves the researcher inspecting, analysing and recording events of interest (Blaxter et al. 1996). Observations can enable a person to capture the explicit manifestations of a culture (represented in the outer layers of the generic model of culture discussed in chapter 3), for example symbols and style. Observations, as the first part of this study, involved studying three aspects of the finance department.

4.2.1.1 Statements

The first aspect that I examined was what a culture states about itself from its mission . statements, website, annual reports and press releases. Some cultures recognise the importance of their values and their people and want the world to know this. Other cultures focus on the business and its performance without much mention of human efforts (Deal & Kennedy, 1982). These statements serve to increase the understanding of a culture.

4.2.1.2 Physical setting

The physical setting might be irrelevant to the conduct of business but it reveals a lot about a

culture (Deal & Kennedy 1982). A company that is proud of itself and its culture will reflect this pride through its environment, and Deal & Kennedy suggest that the location, character and size of the building, offices layout and dress code express what the company wants to stand for to the outside world.

#### 4.2.1.3 Disposition

The final aspect was the disposition of the culture. The way in which strangers are greeted, the way that employees interact with each other and the way that they spend their time are all indicators of a culture. For example, in a service-conscious company, guests might be offered coffee when entering, and in a bureaucratic environment each guest might have to go through a sign-in procedure before entering. In general, observations of the disposition of a culture can increase our awareness of this culture.

### **4.2.2 Interviewee selection**

Interviewee selection was an important feature of the data gathering method. Stakeholders had to be from different divisions of the same department/organisation, have different roles and responsibilities, and belong to a different level in the hierarchy. The diversity of roles and responsibilities and of the job statuses of the interviewees were all critical factors. It ensured a more complete coverage of the culture of the department.

### **4.2.3 Interviews**

Interviews are an important tool for eliciting evidence of a culture. Any information captured during an interview can help increase a researcher's understanding about that culture (Deal & Kennedy 1982). The interviewing technique consisted of 3 sets of semi-structured questions.

#### 4.2.3.1 Basic questions

The interviews started with a set of questions about the interviewee. The questions related to the person's job, the time s/he had been working there, and finally their perception of the climate in the finance department. Example questions are given below, the full set of questions is provided in the appendix 4.1, and the fully transcribed answers to these questions can be found in appendix 4.2:



- ♦ How long have you been working here?
- ♦ What are your roles in the finance department and beyond?
- ♦ Give me a few words to describe the climate, culture of your department.

These questions derived from the need to have an introduction for the rest of the interview, and at the same time to identify what each of the interviewees did in the department.

#### 4.2.3.2 SAP implementation questions

This set of questions was introduced to elicit information about the SAP implementation in general. It was intended to provide detailed evidence about how the implementation was decided, took place, the problems faced and how employees felt. Questions for this part of the interview included the following (the full set of questions is given in the appendix 4.1 and the transcribed answers are in appendix 4.2):

- ♦ How have your roles and responsibilities changed as a result of the new system?
- ♦ Were partner consultants involved with you during the new system implementation?
- ♦ How has your work changed as a result of the new system?
- ♦ What problems have arisen as a result of the new system?

These questions originated from two sources. The first was the different case studies and articles about SAP implementations that contained the most common issues arising as a result of such an implementation, for example organisational restructuring or training. The second source was the meta-schema of culture presented in chapter 3. The meta-schema included key manifestations of ERP/IS implementations. Each question's aim was to extract information about at least one of those manifestations of ERP/IS implementations.

#### 4.2.3.3 Culture-related questions

This part of the interviewing technique elicited information about the organisational culture of the finance department. These questions were designed to extract characteristics of the culture independent of the SAP implementation that took place. A sample of the questions asked are presented below (the full questionnaire is provided in the appendix 4.1 and the answers to the questionnaire in appendix 4.2):

- ♦ Were there, or are there now detailed regulations, rules and procedures for most of the

things you do/did?

- ♦ Are good results being rewarded? Why do you think so?
- ♦ Is risk-taking too risky? How do you feel about that?
- ♦ Have many employees experienced problems related to job stress? Has something been done about it?

The set of questions used for the third part of the interview was derived from two sources; the existing culture questionnaires reported in the literature, and the meta-schema of culture. Scholars of culture (Hofstede 1994, Trompenaars 1994) have their own questionnaires for eliciting culture. Whilst constructing my questionnaire for this study, I examined the questionnaires that were available to decide the layout of the questionnaire and the formulation of the questions. Moreover, I investigated the manifestations of culture included in the meta-schema and prepared at least one question for each of the manifestations. The meta-schema of culture was presented in chapter 3.

All three sets of questions were accompanied by a process and some guidelines on how to conduct the interviews.

#### **4.2.4 Interviewing process**

The employees of the finance department were interviewed individually. All interviews were tape-recorded (see the complete interview transcripts in appendix 4.2). The interviews were held in two stages. In the first stage the interviewer asked the first 2 sets of questions (basic questions and SAP implementation questions). In the second stage the interviewer asked the 3<sup>rd</sup> set of questions (culture-related questions). The interviews were held over two days, one day for each stage of the interviewing process.

Each of the first-stage interviews lasted for 40 minutes. My intention was to ask the basic questions first to learn more about the interviewee and “break the ice”. Subsequently, I started asking questions about the climate and the SAP implementation that took place based on the 2<sup>nd</sup> set of questions presented above. My aim during the second stage was to elicit information about the climate in the department, the SAP implementation, and problems that arose. This was a crucial stage because the problems elicited from this stage had then to be associated with the answers elicited during the second stage. This association is discussed in the data analysis phase where, as a result, I identified the culture-related problems within the finance department. Therefore, it was important to elicit as many problems and explanations behind them as possible. Hence, the outcome from this stage was a list of explicit manifestations of



culture and a set of problems resulting from the SAP implementation.

In the second stage, the interviewer applied the culture-related questionnaire and each interview lasted 1 hour. My aim at this stage was to elicit evidence of the implicit, underlying manifestations of the culture at the finance department. In order to achieve this, the third set of questions. This stage involved asking the interviewees each of the questions of the culture-statement questionnaire as well as to elicit the “why” behind their answers. This approach helped me to elicit the implicit, underlying manifestations of the culture that might have been the cause of problems reported in the first stage of the interviewing process. This is explored in the next section.

#### **4.2.5 Data analysis**

The interviews at the finance department provided data about the SAP implementation and the culture of the department. Patton (1990) suggests that interviews can be analysed either by writing a case study for each individual interviewee (case-analysis) or by grouping together topics from the interview questions (cross-interview). I applied case study analysis as it enabled examination of the answers from each individual stakeholder separately. All interviews were transcribed for reference purposes (see appendix 4.2). A four-stage data analysis was undertaken, shown in figure 3.1.

##### **4.2.5.1 Identification of relevant data from the transcribed interviews**

The first stage of the data analysis was to identify relevant data from the transcribed interviews. Relevant data included either statements about problems and issues related to the SAP implementation, or statements about the culture of the finance department. In order to identify the relevant data, I read each interview transcript, underlining and commenting on either of the 2 possible kinds of statements. The statements that related to the SAP implementation, were simply any comments the interviewees made to the 2<sup>nd</sup> questionnaire. Such comments were, for example, about the implementation process, the training they received, or issues they had with the certain transactions. The statements that related to the culture of the finance department were obtained from the interviewees’ answers to the third set of questions. This approach had similarities to content analysis, where various kinds of data are labelled and classified in order to structure an extensive corpus of information (Patton, 1990).

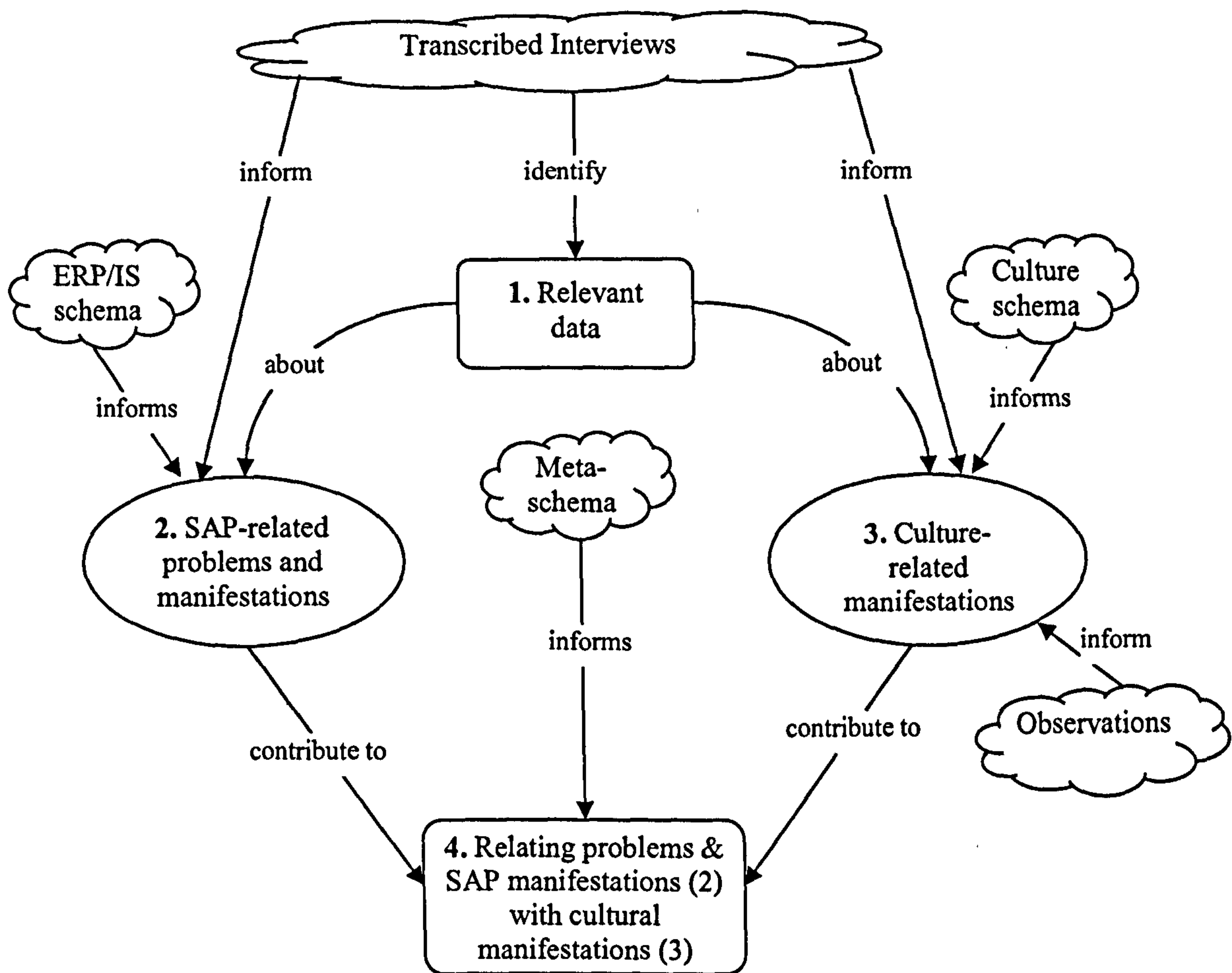


Fig 4.1: The 4-stage process of data analysis: each of the four stages in turn contribute to the discovery of the culture-related problems

#### 4.2.5.2 Elaboration of the problems identified

The next stage elicited more knowledge about the problems and issues arising from the SAP implementation. The aim was to detect for each problem or issue, the manifestations associated with it, which instantiate the schema of ERP/IS implementations (see figure 3.4 in chapter 3) based on their definitions. For example, for problem P1, through the transcribed interviews and by referring to the ERP/IS schema, a relevant action A1, an associated role R1 and responsibility RS1 were identified for agent A1. The final outcome was an instantiation of this schema for each problem.



#### 4.2.5.3 Specifying the manifestations of the meta-schema

This stage of the data analysis process identified the culture-related problems. This was achieved by detecting which problems have cultural manifestations associated with them. The cultural manifestations associated with problems were identified from two sources:

1. Observations made at the first part of the method.
2. Relevant data identified in the first stage of the data analysis process.

The aim was to specify for each problem identified in stage 2 all of the possible cultural manifestations that could be associated with it. To identify each manifestation, I used their definitions from chapter 3 and checked to which manifestation of culture, each of the stakeholder's statements and each observation was referring to. For example, for agent A1 I identified the expressed value V1, about problem P1 (which was recognised in the previous stage). By referring to the schema of culture, examining the definitions and consulting the cultural statements, I was able to discover other manifestations that were associated with problem P1. The final outcome was an instantiation of the schema of culture, for each problem identified, that included associated key manifestations of culture and their inter-relationships.

#### 4.2.5.4 Relating ERP manifestations with cultural manifestations

The final step involved associating the instantiation of the ERP manifestations (schema of ERP/IS implementation) and the instantiation of the cultural manifestations (schema of culture), for each identified culture-related problem. This was achieved by looking at the meta-schema of culture and replicating it by using the manifestations in the two schemas. The outcome was a number of instantiations of the meta-schema of culture. Each instantiation described one of the problems identified and would include all the key manifestations associated with it. Those key manifestations would be presented in the instantiations by the stakeholder's quotes as identified at the third stage of the data analysis. This step gave rise to possible culture-related explanations of these problems. The outcome of this step is essentially the results, which are discussed in the following section.

### **4.3 The results from the study**

I interviewed 2 of the 17 employees in the finance department because they were more involved in the implementation than the other employees and had been working in the finance department for a long time. The 2 interviewees worked in different functional areas of the department at different levels. They were an accounts payable officer and an accounting services manager.

Results were two-fold: (i) results about the culture of the finance department, and (ii) results about culture-related problems. All results were based on observations and interviewing data as described in the data gathering and analysis method. The definitions of the manifestations of the meta-schema were applied to the interview transcripts to separate and produce instantiations of the culture-related problems from the others.

#### **4.3.1 The culture of the finance department**

Evidence of the finance department's culture was elicited from observations and culture-related questions. See appendix 4.3 for the list of the observations made and appendix 4.2 for the transcribed interview to the culture-related questions. From those 2 sources, I summarised the culture of the finance department.

##### **4.3.1.1 Results from the observations**

There were no official or unofficial mission statements or brochures that referred specifically to the finance department, as it is a function behind the services that the University provides to students. All available brochures and mission statements referred to the university's different departments and courses. The finance department did have a web site that included information about the services that it provides, as well as a list of the people who were working there and their roles and responsibilities. The finance department was positioned in the same part of the building as other non-academic departments. The offices were open-plan and, at the time of the interviews, being renovated. The employees that were higher up in the hierarchy had their own offices that separated them from the other employees. The dress code was rather formal and strictly applied, although the employees mainly interacted with each other and only occasionally with students. The 16 employees of the finance department had a tendency to stick together. They organized their own lunches and sporting activities together. The behaviour of the employees towards strangers was friendly but formal.



#### 4.3.1.2 Results from the culture-related questions

From the interview responses to the culture-related questions, the general feeling about the organisational culture was elicited. First of all, it became apparent that the organisational culture of the finance department did not strongly support the development and training of its employees. If they wanted more training, they could receive it, but it would mean that they had to take time out of their jobs, which was not a feasible option. Another aspect of the organisational culture was that the extra work that the employees had to do as a result of the SAP implementation was not appreciated. It was felt by the employees that the extra work was implicitly expected of them, and was not recognised or rewarded. In addition, the culture did not impose any explicit rules and regulations about the work of the employees, but the nature of their job did, in terms of how things had to be done. Finally, different sections within the department were not treated in the same way. Employees from the accounts payable section felt that the management of the finance department, when compared to the accounting services section, had treated them unfairly. New people had been employed to help with the extra work at the accounting services section, whereas no extra people were employed at the accounts payable section. This is summed up by the accounts payable officer who said *“there is more priority to get money in rather than out, which is what we are responsible for”*.

#### **4.3.2 The problems that arose from the SAP implementation**

The problems that arose in the finance department from the SAP implementation were elicited by using the SAP implementation questions. See appendix 4.2 for the transcribed interviews to the SAP implementation questions. By applying the data analysis technique, culture-related problems were identified.

Interview data revealed that the SAP implementation at the finance department *“simply took place because the system they had previously was too old to accommodate their needs”* (accounts services manager). According to the accounts services manager *“the IT officer of the department researched possible replacements and decided that SAP R/3 was the best solution”*. Other employees in the finance department did not have any input in that decision and were not asked for their requirements or needs (accounts services manager, accounts payable officer).

Results from the interviews identified several problems that arose as a result of the SAP implementation. Problems that were not identified as culture-related include:

- It was too complicated to insert new information such as vendor information into the system because there are too many screens one has to browse through in order to complete all of the required fields
- It required more work when entering new data into the system (e.g. new vendor, supplier, student etc.) because there are too many fields to complete. The R/3 requires too much detailed information
- The code numbers assigned by the system for transactions are very similar to the codes assigned for vendors causing confusion and leading to mistakes
- Once information in the system had changed, it is almost impossible to change it.

Results from the interviews also revealed that the culture-related SAP implementation problems in the finance department were related to procedures, workloads and the lack of training made available to the end-users of the new system. The interviewees offered numerous reasons for this, including lack of access to official training courses and the time to go on them. Below, I describe 3 culture-related implementation problems that were identified from the data gathering and analysis method. I present them in 3 parts. I start with a textual description of each problem, using the relevant data identified from the interview transcripts, then I discuss how each instantiation was produced and finally, present the instantiation itself.

#### 4.3.2.1 Dissatisfaction with the R/3

The first transcript segment revealed the problem of dissatisfaction with the new system. The accounts services manager thought *“the R/3 system would be more efficient than the old system they had at the finance department, and therefore would reduce the workload”*. He believed that *“workload would reduce and therefore work would get easier and would be more fun because of the implementation of the R/3”*. However, according to the accounts services manager, after the implementation, tasks such as analysing online enquiries became more lengthy and complex. *“This is irrational! The work has increased and it is harder and on top of everything the system is not fun to use at all”*. The accounts services manager felt disappointed with the new system, as it did not meet his expectations. The increased workload had a direct effect on his job satisfaction, and motivation, which also led to more mistakes.

In order to produce an instantiation of this problem, I had to specify the manifestations of the



meta-schema, one by one:

- ♦ I started by identifying from the relevant data above, the expectation of the accounts services manager of the new system, namely the norm of the agent. The accounts services manager stated that before the implementation, he thought that R/3 would be more efficient than the old system, resulting in workload reduction. This is an expectation on the new system, and hence a norm, and is highlighted in the relevant data with grey;
- ♦ The next step identified the belief, which is the explanation of why this agent has this expectation. The agent argued that if workload decreases, then work would be easier and more fun. This is a belief and is highlighted in blue;
- ♦ For the expectation to be met, it is important that the R/3 system is more efficient than the old one. This is the value, which derived from the concept 'norm', identified earlier;
- ♦ The final step was instantiating the meta-schema by using the aforementioned manifestations. The resulting instantiation is presented in figure 4.2.

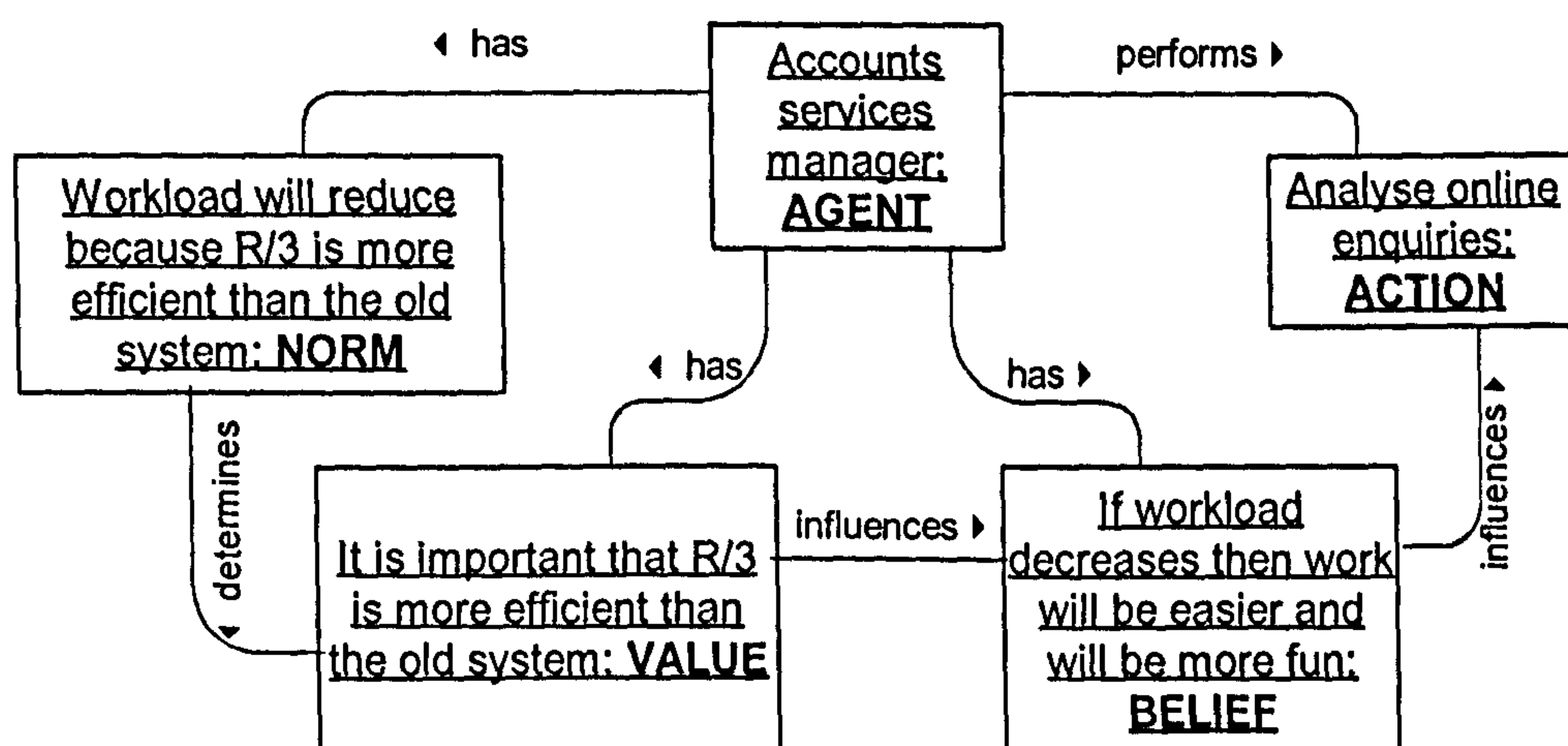


Fig 4.2: An instantiation of the meta-schema describing the problem of dissatisfaction with R/3

#### 4.3.2.2 Lengthy and error-prone action

In another transcript segment, the problem of lengthy and error-prone actions was identified. The accounts payable officer believed that *“the training on the new system that he would receive would enable him to do his work faster and more accurately”*. According to the accounts payable officer, *“I believed that we would receive adequate training when dealing with a new system as big and complex as this one”*. However, he believed that the training received on the new system was inadequate as *“most staff, including me, had tops one afternoon of training*. This individual valued high-quality training as a requirement to use

such a system successfully. Instead, the lack of training increased the number of mistakes and he believed that he was unable to perform his roles and responsibilities effectively. The accounts payable officer felt disappointed with the training he received, as it did not meet his expectation. Performing actions such as issuing an invoice became prone to errors and was time-consuming due to the lack of training.

I followed the same procedure as before to identify the manifestations of the meta-schema.

- ♦ The expectation (norm) of the accounts payable officer was that he thought that he would receive adequate training because the R/3 is big and complex;
- ♦ The next step involved identifying the belief, which is highlighted in blue. The agent argued that if adequate training was received then he would be able to do his work faster and more accurately;
- ♦ The value for this instantiation is that ‘it is important that adequate training is available on the new system’, which is the condition of what has to happen for the norm to be met;
- ♦ The final step was instantiating the meta-schema by using the aforementioned manifestations. The resulting instantiation is presented in figure 4.3.

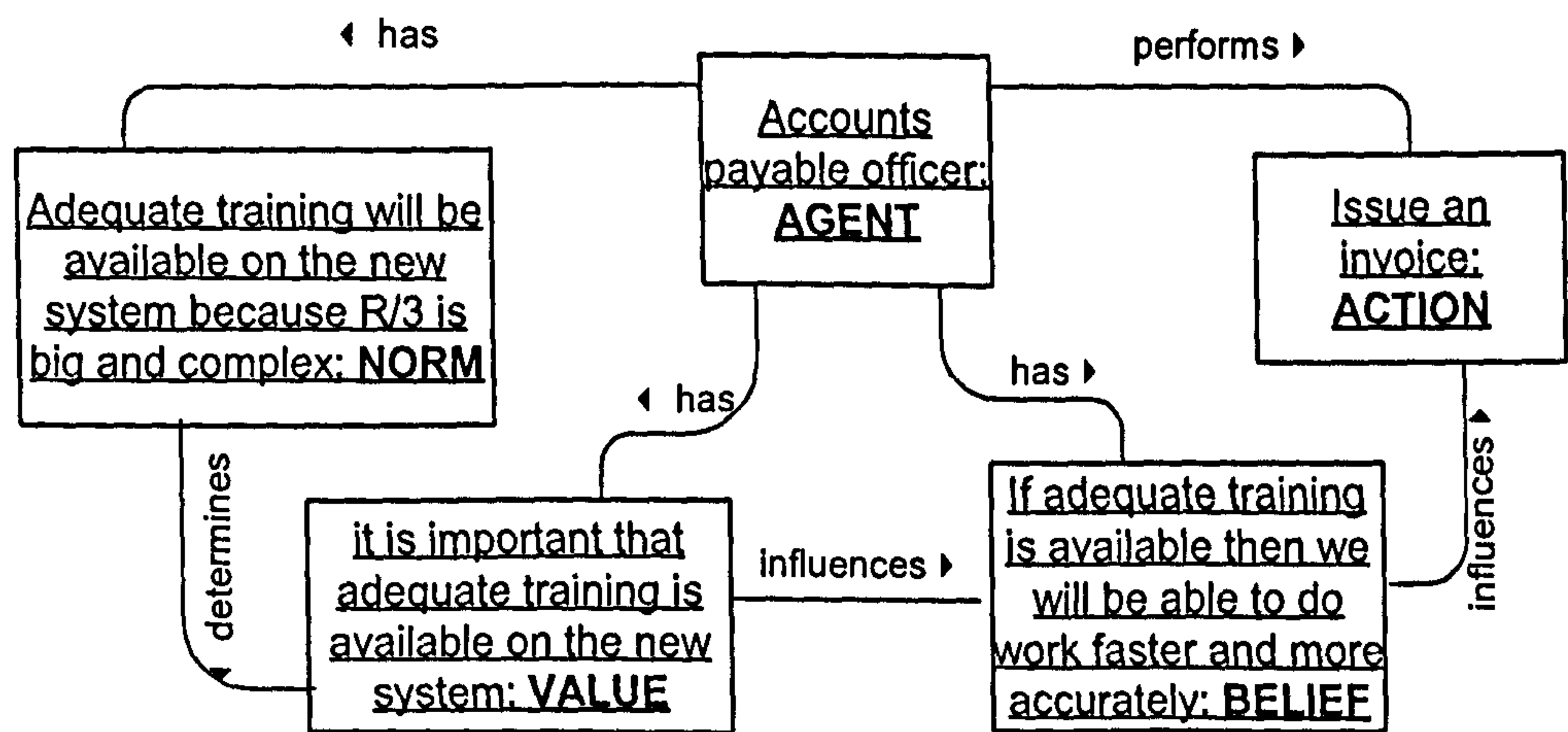


Fig 4.3: An instantiation of the meta-schema describing the problem of lengthy and error-prone actions

#### 4.3.2.3 Importing information

In a third transcript segment the problem of importing information into the R/3 system was identified. The accounts payable officer believed that “if work increases because of the new system, new staff should be employed”. He added “this is only fair as we are expected to



*continue doing our day-to-day job*". However, the introduction of the new system meant that he had to import information from the old system into the new system on top of his other work activities, whereas other sections in the department received extra staff to manage the implementation of the new system. The accounts payable officer felt that this was unfair. *"Another department received 4 extra people and their work has not increased as much as ours. We asked, but we didn't get anyone... I was told we are going to get new people that will insert the information to the new system and I thought this is only fair! But we didn't get anyone"*. The mismatch between work and staff levels left him feeling upset and not appreciated at all, as his expectation was not met. This situation has led to this agent doing more work than he anticipated. He was carrying out his day-to-day tasks but was also importing information into the new system, which resulted in him working longer and at the weekends.

For this problem the same procedure was followed, and the following manifestations were identified:

- ◆ The expectation (norm) of the accounts payable officer was that if work increases because of the new system, the number of available staff would increase as well (this is the norm highlighted in grey above);
- ◆ It is only fair that if work levels increase then staff levels should increase as well, as the agent is expected to still carry on his day-to-day job (belief, highlighted in blue);
- ◆ It is important that more staff are employed when work levels increase (this is the value)
- ◆ The final step was instantiating the meta-schema by using the aforementioned manifestations. The resulting instantiation is presented in figure 4.4.

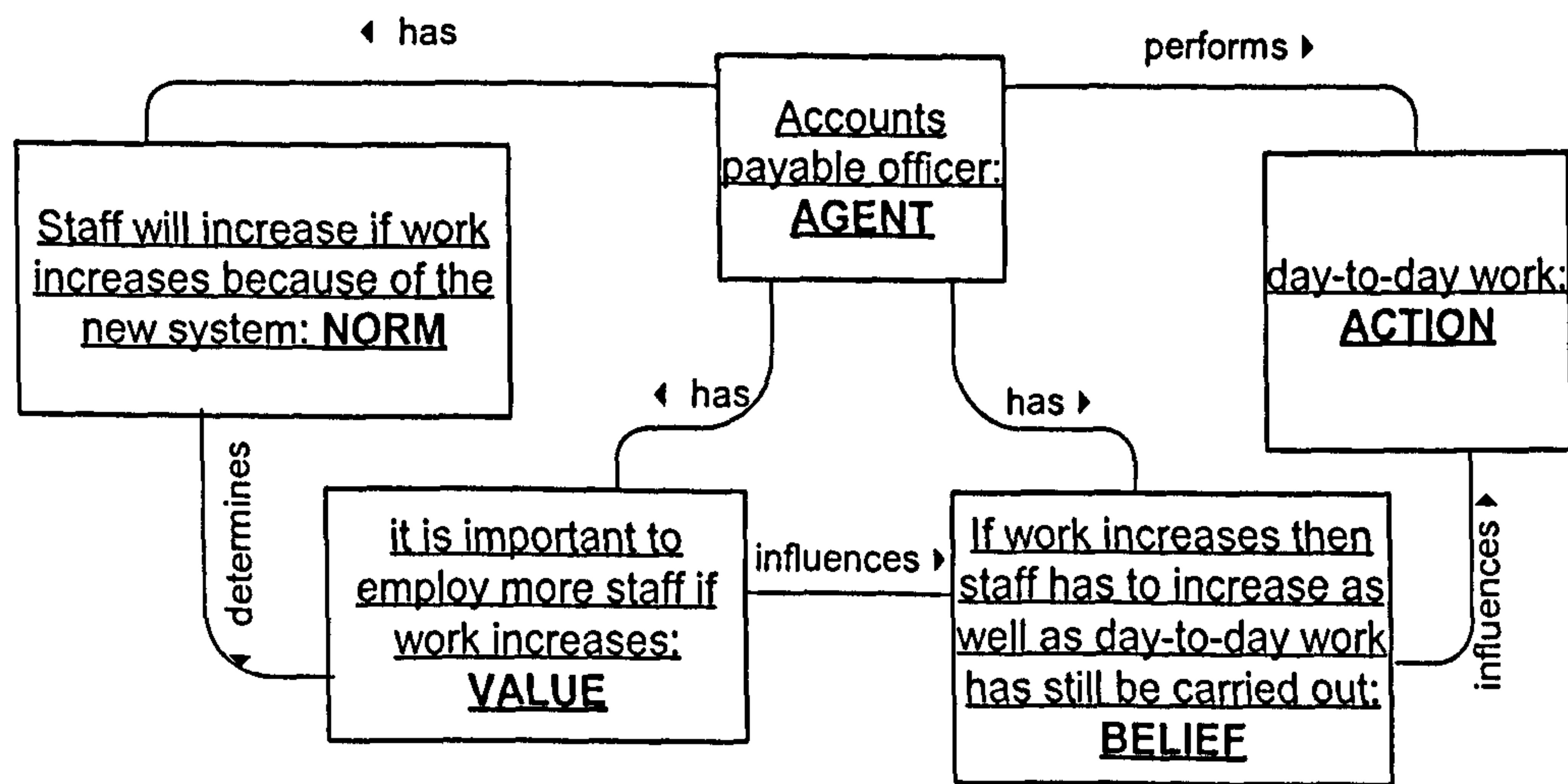


Fig 4.4: An instantiation of the meta-schema describing the problem of importing information into the R/3

## 4.4 Discussion of the results

The study at the finance department was conducted to investigate hypotheses one (H1) and two (H2) and to assess the strengths and weaknesses of the data gathering and analysis method.

### 4.4.1 Hypothesis one (H1)

Hypothesis one (H1) is the following:

**H1** Organisational and national cultures have a critical impact on the efficiency of ERP implementations

The sub-objectives that were set to enable me to test this hypothesis were:

1. To conduct empirical studies that will elicit problems that customer organisations encounter when implementing an ERP package.
2. To investigate whether some of those problems occur because of the national and organisational culture of the customer organisations.
3. To examine whether these culture-related problems are as critical as other types of ERP implementation problems.

All sub-objectives were achieved; a preliminary empirical study was conducted that elicited a number of problems in the finance department. Some of the problems occurred because of the culture of the finance department, providing evidence for hypothesis one (H1). All 3 instantiations (figures 4.2, 4.3, 4.4) of the meta-schema reveal evidence that the reported problems arose because of the violation of certain cultural manifestations. Finally, all 3 culture-related problems were found to be at least as critical as the other types of problems the finance department faced because it affects the agent's performance on the R/3.

For example, in the first instantiation in figure 4.2, the importance of the agent's norms, values and beliefs on performing an action, was identified. The critical manifestation of this model was the agent's expectation expressed as a norm, which in turn reflected the agent's values and beliefs. This instantiation illustrates how the action of "*analysing online enquiries*" has changed because of the implementation of the new system. This 'changed' action gives rise to the violation of the norm "*workload will reduce because R/3 is more*



*efficient than the old system*” and creates the culture-related problem of “*dissatisfaction with the R/3*”. In simple words, the accounts services manager had an expectation on the new system. When he tried to analyse online enquiries in the new system his norm was violated, and the problem of disappointment with the R/3 surfaced. This culture-related problem can be argued to be as important as the other types of problems in the finance department, because it affects the agent’s performance on the R/3. However, there is no evidence to suggest it is more important than the other problems. The same arguments hold for the other 2 instantiations.

Hence it can be inferred that the results show that culture has a critical impact on the efficiency of the SAP implementation at the finance department, because it gave rise to culture-related problems. These problems can be claimed to be as important as the other types of problems the finance department faced, because of the effect they had on the employees and on how they used the R/3. Therefore, preliminary evidence has been found to accept hypothesis one (H1).

#### **4.4.2 Hypothesis two (H2)**

Hypothesis two (H2) is the following:

**H2** Social and management science theories and models can be integrated and progressed to develop a descriptive model (meta-schema) of some of the key manifestations of national and organisational culture that are critical to ERP implementations

The sub-objectives that were set to enable me to test this hypothesis is:

1. To develop models (instantiations) of the descriptive model (meta-schema).
2. To investigate whether these models (instantiations) have descriptive properties of some of the key elements of culture, critical to ERP implementations.

The results from the study at the finance department demonstrate that the objectives were achieved and offer support for hypothesis two (H2).

First of all, the 3 instantiations were able to demonstrate that culture has an impact on the efficiency of ERP implementations. This means that each instantiation is a descriptive model of the key manifestations of culture critical to ERP implementations, as this is exactly where



the argument for hypothesis two (H2) was based. In the first instantiation, this model-driven analysis of the problem of “*dissatisfaction with the R/3*” provided a description of how the action of “*analysing online enquiries*” gave rise to the violation of the key manifestation of culture: norm. Hence, the instantiation has descriptive properties of the key manifestations of culture, critical to ERP implementations. The same holds for the other 2 instantiations as demonstrated in the previous section when discussing hypothesis two (H1).

Based on the results from this preliminary study, it was revealed that a culture-related problem arises through the violation of the manifestation ‘norm’ when an agent performs an ‘action’. This association between the manifestation ‘norm’ and the manifestation ‘action’ was not illustrated in the meta-schema of culture presented in chapter 3. In figure 4.5, I introduce the updated meta-schema of culture (please note the new association added, highlighted in red).

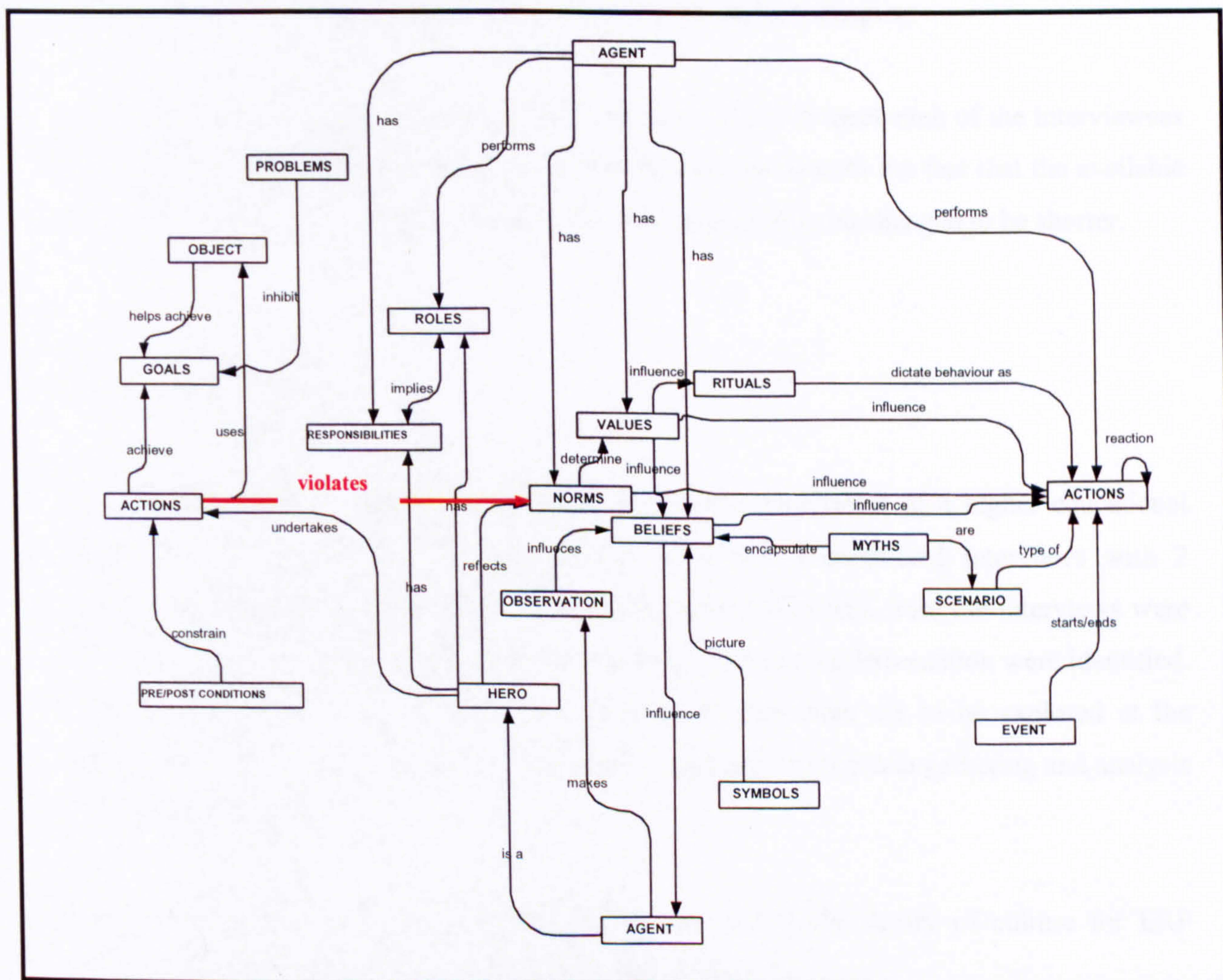


Fig 4.5: The updated version of the meta-schema of culture



### **4.4.3 Data gathering and analysis method**

The data gathering and analysis method appeared to be effective. It provided a large corpus of data, albeit from only two interviews, about the SAP implementation, the culture of the department, and the problems faced as a result of the implementation. The method also appears to be neutral. The existence of 2 questionnaires, about the SAP implementation and the culture of the department, ensured this neutrality. Rather, I established the relationship between the problems and the culture during data analysis.

However, the method had some limitations. One limitation was the structure of the culture-related questionnaire. By having a statement questionnaire, which the interviewees could respond to by ticking the appropriate answer, I could use their answers to conduct descriptive statistics for in depth analysis. Such an analysis was not possible the way that the questionnaire was structured for this study. Hence, for the next study, I changed the questionnaire to a statement questionnaire as shown in the next chapter.

Another limitation was the duration of the interviews. I had to meet each of the interviewees twice, and each interview lasted for more than 30 minutes. Due to the fact that the available time with possible interviewees is limited, the interviews had to be changed to be shorter.

## **4.5 Conclusions**

This chapter reports a preliminary study at the finance department of a higher educational establishment that had recently implemented SAP R/3. I conducted interviews with 2 employees using the data gathering and analysis method. The data from the interviews were analysed and the culture-related problems that arose from the implementation were identified. Results were used to test each of the 2 hypotheses that were set to be explored at the beginning of this chapter, and the strengths and weaknesses of the data gathering and analysis method were reviewed.

The next chapter discusses the studies carried out to test the theory of culture for ERP implementations as set out in hypotheses H1, H2, H3 and H4.

## **Chapter 5**

### **Empirical Testing of the Theory of Cultural Impact on ERP Implementations**

This chapter describes the main studies undertaken to test the theory of culture for ERP implementations



## Chapter 5

# Empirical Testing of the Theory of Cultural Impact on ERP Implementations

### 5.1 Introduction

This chapter reports on the empirical studies undertaken at a large multi-national European supplier of pharmaceuticals and laboratory equipment. The company implemented SAP's R/3 throughout its national subsidiaries. I conducted studies at 3 of those subsidiaries with the support of a student under my guidance. The aim of this empirical study was to test hypotheses H1, H2, H3, and H4:

- H1 Organisational and national cultures have a critical impact on the efficiency of ERP implementations.
- H2 Social and management science theories and models can be integrated and progressed to develop a descriptive model (meta-schema) of some of the key elements of national and organisational culture that are critical to ERP implementations.
- H3 Social and management science theories can be extended to produce models that accurately describe the culture-related problems observed in current ERP implementations.
- H4 Social and management science theories of culture can be extended to produce models that can be applied to explain the reasons behind the culture-related problems arising from ERP implementations.

This chapter is in 3 parts. In the first part, I introduce the changes to the data gathering and analysis method. In the second part, I present and discuss the results from the studies and finally, I conclude this chapter by reviewing the hypotheses and providing a summary of the chapter.

## **5.2 The changes to the data gathering and analysis technique**

The data gathering and analysis technique was changed to overcome the 2 limitations identified in the previous chapter, that the method was time-consuming and that the culture-related questionnaire's structure did not enable more in-depth analyses of the data.

The 2 changes were:

1. The questionnaire was changed to a statement questionnaire. Interviewees had to select from a scale of A to G (A: strongly agree and G: strongly disagree) how much they agreed with a set of statements (see appendix 5.1). Such a statement questionnaire enabled more effective analyses of interviewees' responses.
2. Questionnaires were sent to the interviewees prior to the interviews, so that the interviewees knew what the study was about beforehand. Moreover, as the culture-related questionnaire changed its structure, I was also able to send it before the actual day of the interview. Therefore, on the day of the interviews, I already had background information about each interviewee as well as her/his completed culture-related questionnaire. Thus, I was able to ask them the SAP implementation questions and also elicit the "why" behind their answers in the culture-related questionnaires.

Those changes reduced the duration of the interviews and time spent with the interviewees. The revised data gathering and analysis technique is presented in appendix 5.2.

## **5.3 The study's approach**

The method was applied identically in all 3 subsidiaries. I interviewed employees fulfilling same job roles in 3 organisations operating in 3 countries as part of the same parent company that had implemented the same ERP package.

The first factor to consider was the choice of the companies. Instead of choosing a number of different companies in different countries, I chose 3 subsidiaries of the same organisation. This facilitated the comparison between different organisations of the same company that operated within the same market - the main difference was they were placed in different countries. Hence, the empirical study was undertaken on-site at 3 subsidiaries of a large multi-



national European supplier of pharmaceuticals and laboratory equipment. The 3 subsidiaries were situated in the UK, Germany and Sweden (for the Scandinavian subsidiary).

Another factor to consider was that all 3 subsidiaries of the multi-national pharmaceutical organisations had all implemented the same SAP R/3 SD (sales & distribution) and WM (warehouse) modules.

An additional factor to take into account was the language that would be used for the questionnaires and the interviews, at each of the 3 subsidiaries. I decided to use the local language for each subsidiary, to ensure the full understanding of the participants and hence their answers. Therefore, all questionnaires were prepared and the interviews were conducted with each participant in their native language. For the Swedish subsidiary, a Swedish student translated the questionnaires and accompanied me during the interviews. For the German subsidiary, I translated and conducted the interviews myself, as I am a German native speaker. For obvious reasons, no extra work was needed for the English subsidiary.

The data gathering and analysis method recommended choosing employees from different roles and different departments to ensure a representative exploration of the culture of an organisation. Data was gathered from the employees shown in table 5.1:

Subsidiary Job role	Scandinavian	UK	German
Key User SD	✓	✓	✓
IT SD Developer	✓	✓	
IT MM Developer	✓	✓	✓
IT WM Developer	✓	✓	
Warehouse Manager	✓	✓	✓
Marketing Manager	✓		
Key User Marketing	✓	✓	
Administrative staff	✓	✓	
Customer Services Manager	✓		
Consultant		✓	
SD End User		✓	
Corporate ISM		✓	
IT Development Manager	✓		✓

Table 5.1: The job roles of the interviewees for each subsidiary (a tick ✓ shows which employee was interviewed in which subsidiary)

The results from the studies conducted at the 3 subsidiaries are presented in the following sections.

## **5.4 The results**

The results are in 3 parts. In the first part, I present findings about the culture of each of the subsidiaries. In the second part I present the SAP implementation at each of the subsidiaries. In the last part, I analyse the findings about the problems that arose as a result of the SAP implementation(s).

The results about the culture of each of the 3 subsidiaries were derived from the observations and the answers to the culture-related questions. Evidence about the culture-related implementation problems is based on answers to the SAP implementation questions and the culture-related questionnaires. All results are supported with quotes from the interviewees and some qualitative analysis of the interviewing data.

The studies at the 3 subsidiaries did not aim to elicit a complete list of all ERP implementation problems, but rather to elicit and explore the culture-related ones. Moreover, the aim of the studies is to test the theory discussed in chapter 3 rather than compare differences in the effectiveness of the implementations in the 3 subsidiaries.

### **5.4.1 The culture of the 3 subsidiaries**

The multi-national organisation is a German company that operates on the pharmaceutical market and discovers, develops, manufactures and markets human and animal health products and services. The turnover for 1999 was £2.8 billion with a workforce of nearly 29,000 people world-wide. On the 1<sup>st</sup> of January 1999 an establishment was formed to combine the strengths of the various European subsidiaries and to develop a more effective distribution business. Through one central European management operation in Brussels, the aim was to improve effectiveness and develop common operating strategies for the laboratory business in Germany, France, the UK, Austria, Switzerland, the Benelux countries and Scandinavia (based in Sweden). One step in this process was that all subsidiaries should be live on SAP R/3, which would enable business integration between subsidiaries.



#### 5.4.1.1 The culture of the Scandinavian subsidiary

The Scandinavian subsidiary, based in Sweden, had its own web site that is written mainly in Swedish. There was no obvious mission statement. The Scandinavian subsidiary employed approximately 200 employees and the majority worked in sales, marketing and customer service. The company provided total solutions combining the delivery of equipment with the consumption of chemicals and consumables. They also provided schools and centres of higher education with the materials needed for vocational studies and laboratory work in physics, biology and chemistry. The product areas were chemicals and diagnostics, cell and molecular biology products, apparatus and instruments, laboratory furniture and safety ventilation, glassware, plastic articles and utensils. The sales and administration office was located just outside Stockholm, and the warehouse was in a small town 250-km north west of Stockholm.

From the observations made when visiting the Scandinavian subsidiary, the following evidence about its culture was collected (see appendix 5.5 for the complete list of observations). An example is provided below, followed by a discussion of the observations as elicited from the observations part of the data gathering and analysis method. (Please note that in the discussion, the number in brackets following each sentence, corresponds to the observation number of the list in the appendix 5.5).

1. New office building
2. Located in industry area outside the town centre.

The Scandinavian subsidiary was situated in a new office building (1) just outside Stockholm, in Sweden (2). Three more companies were located in the same building (3). There were no shops, cafeterias or leisure activities in the area (4). The overall impression of the offices was that they were simple and clean with no unnecessary clutter (12). There was a modest manifestation of the company logos or the company name (15). Employees had their offices situated according the department that they worked (5), either on their own or shared with one more person (22). In general, dress code was informal and relaxed (16). Employees had free coffee and tea available to them (9) and had lunch at a simple restaurant, which was shared with the other companies situated in the building (10). There were common areas for the employees to sit in and meet (18). Finally, there was a suggestion box available for the employees where they could anonymously propose changes or make complaints (7).

The climate at the Scandinavian subsidiary, in general, could be described as friendly but formal. This conclusion was drawn from how the employees interacted with each other and

with strangers. Employees mostly interacted within departments (20), again in a friendly but rather formal way. They did not seem to spend time together in the common rooms provided (18), apart from during lunch or social events organised by the company (24). Guests were treated in the same friendly and rather formal way. There were no visitor passes and guest could access almost every room (13,14). The behaviour of the employees towards them was friendly but again rather formal (24).

The responses of the interviewees to the culture-related questionnaire provided data about what the employees perceived the culture of the subsidiary to be. Ten culture-related questionnaires were returned. Table 5.2 shows the distribution of responses for all 30 statements (shown in decimalised values).

	A: Strongly Agree	B: Agree	C: Tend to agree	D: Neutral	E: Tend to disagree	F: Disagree	G: Strongly disagree
Q1	0.1	0.2	0.4	0	0.2	0	0.1
Q2	0	0.3	0.3	0	0	0.2	0.2
Q3	0.1	0.1	0.4	0.2	0	0.2	0
Q4	0.1	0.1	0	0.3	0	0.2	0.3
Q5	0.2	0.5	0.1	0.1	0.1	0	0
Q6	0.1	0.2	0.2	0.3	0.2	0	0
Q7	0.4	0.4	0.1	0.1	0	0	0
Q8	0	0.1	0.3	0.2	0.2	0.1	0.1
Q9	0.1	0.2	0.3	0.2	0.1	0.1	0
Q10	0.1	0.6	0.2	0.1	0	0	0
Q11	0	0.1	0.4	0.2	0	0.3	0
Q12	0.1	0.3	0.1	0.4	0	0.1	0
Q13	0.1	0	0.3	0.2	0.1	0.3	0
Q14	0	0.1	0	0.2	0.1	0.6	0
Q15	0.4	0.5	0.1	0	0	0	0
Q16	0	0.4	0.2	0.1	0.1	0	0.2
Q17	0	0.1	0.2	0.3	0.1	0	0.3
Q18	0	0.3	0.6	0	0	0.1	0
Q19	0	0.1	0.4	0.4	0.1	0	0
Q20	0	0	0.1	0.4	0.3	0.1	0.1
Q21	0.1	0.3	0.4	0.1	0	0.1	0
Q22	0.1	0.3	0.4	0	0.1	0.1	0
Q23	0.4	0.4	0	0.2	0	0	0
Q24	0	0.2	0.3	0.4	0.1	0	0
Q25	0.1	0.1	0.1	0.2	0.1	0.2	0.2
Q26	0	0.1	0.1	0.2	0.3	0.2	0.1
Q27	0.2	0.4	0.2	0.2	0	0	0
Q28	0	0	0	0.4	0.4	0.2	0
Q29	0	0	0.6	0.3	0	0.1	0
Q30	0	0	0	0.2	0.1	0.3	0.4

Table 5.2: The responses of the employees of the Scandinavian subsidiary to the culture-statement questionnaire (highlighted statements show most frequent)



All 30 statements were designed to extract characteristics of a culture. Interviewees were asked to rank each statement from a scale of A to G (A: strongly agree to G: strongly disagree). The decimal values indicate the percentage of responses to each statement. For instance, for statement 1, 10% (0.1) of the responses were *strongly agree* (A), 20% (0.2) were *agree* (B), 40% (0.4) were *tend to agree* (C), 0 were *neutral* (D), 20 & (0.2) were *tend to disagree* (E), 0 were *disagree* (F) and 10% (0.1) were *strongly disagree* (G).

The responses of the employees to the 30 statements of the culture-statement questionnaire were grouped into three categories. The first category is “agree” which includes responses A, B and C. The second category is “neutral” which includes response D. The final category is “disagree” which includes responses E, F and G. Here, I analyse the statements that were the most frequent amongst the 10 employees (highlighted in the table using grey).

One aspect of the culture of the Scandinavian subsidiary that became apparent was that most of the employees felt that they were appreciated (80%) and that individuals were more important than their jobs (70%) (appendix 5.17, charts 1 and 22). Secondly, 90% agreed with the statement that people were treated fairly regardless of their educational background, age, gender and race (appendix 5.17 chart 10). All employees thought that costs were a major concern for the company, since 100% agreed with this statement (appendix 5.17 chart 15). Moreover, they felt that there were detailed regulations, rules and procedures for most of the things they did (80%). However, they did feel very comfortable taking risks in their job (90%) (appendix 5.17, charts 5 and 18). Half of the employees of the Scandinavian subsidiary disagreed with the statements that the company offered numerous training and career development programmes (50%) or encouraged personal development (50%) (appendix 5.17, charts 4 and 25). The rest of the responses were either neutral or agree. Finally, the majority of the employees think the subsidiary is a good place to work (80%) (appendix 5.17, chart 27).

#### 5.4.1.2 The culture of the UK subsidiary

The following observations were made about the UK subsidiary sources, including its web site, annual reports, and mission statement.

The UK subsidiary had its own web site that included information about its location, operations and services. There was a mission statement on the wall behind the receptionist. In general, the UK subsidiary supplied a wide range of laboratory supplies in the fields of microbiology, bioprocessing and cell diagnostics. The company also supplied special



chemicals to the technical industry and human health markets. The company includes several businesses with a combined annual turnover of over £300 million, employing around 1,500 people in the UK. As in the Scandinavian branch, the sales and warehouse operations were separated, with the sales office located on the south coast of England and the warehouse in the English Midlands.

From the observations made when visiting the UK subsidiary, several observations about the culture were collected (see appendix 5.6 for the complete list of observations). An example is provided below (please note that the number in brackets, following each sentence, corresponds to the observation number of the list in the appendix 5.6).

1. Relatively new building and warehouse situated next to each other
2. Both situated very close to the centre of the city

The UK subsidiary was situated in a new, rather luxurious building next to its warehouse, both close to the centre of the city (1, 2). The building was shared with other companies (11). Most of the offices were open plan, simple (12) and well equipped (16), but rather removed from each other (17). Employees there had free coffee and tea available to them (7). Dress code was formal, although no tie was required (8). Employees had lunch at a relatively small, simple and impersonal restaurant, which was situated inside the building (9). The company used to organise a few social events, like Christmas parties, but the past few years it stopped, so the employees made their own arrangements (20). Finally, there was a mission statement hanging in the lobby that was long and difficult to read (10). The manifestation of the logos or company name was very modest (14).

In general, the climate within the UK subsidiary can be described as friendly and not formal. This conclusion was drawn from how the employees behaved towards each other and towards strangers. The employees seemed relaxed with each other (18) and although the company did not have any common rooms available (15), they still organised lunches, drinks and dinners (10). Guests had to sign in as soon as they arrived for security reasons (3) and were treated less formally than in the Swedish and in a friendly manner (4).

The responses of the interviewees to the culture-related questionnaire provided interesting data about what the employees perceived the culture of the subsidiary to be. Ten culture-related questionnaires were returned. Table 5.3 shows the distribution of responses for all 30 statements (shown in decimalised values).



	A: Strongly Agree	B: Agree	C: Tend to agree	D: Neutral	E: Tend to disagree	F: Disagree	G: Strongly disagree
Q1	0	0.1	0.7	0.1	0	0	0.1
Q2	0	0.4	0.2	0.3	0.1	0	0
Q3	0	0	0	0	0.3	0.6	0.1
Q4	0	0.1	0.2	0.1	0.5	0	0.1
Q5	0.3	0.3	0.1	0.1	0	0.2	0
Q6	0.2	0.5	0.3	0	0	0	0
Q7	0	0.4	0.2	0.2	0.2	0	0
Q8	0	0.1	0.5	0.1	0.3	0	0
Q9	0	0.2	0.3	0.3	0	0.2	0
Q10	0.4	0.5	0.1	0	0	0	0
Q11	0	0.4	0.1	0.3	0.2	0	0
Q12	0	0.5	0.4	0	0.1	0	0
Q13	0	0.3	0.4	0.3	0	0	0
Q14	0	0	0	0.1	0.3	0.5	0.1
Q15	0.5	0.4	0.1	0	0	0	0
Q16	0	0.4	0.5	0.1	0	0	0
Q17	0	0	0.1	0.1	0.2	0.3	0.3
Q18	0.1	0.3	0.1	0.1	0.4	0	0
Q19	0	0	0.3	0.1	0.5	0.1	0
Q20	0	0.2	0.2	0.3	0.1	0.2	0
Q21	0	0.1	0.7	0	0.1	0.1	0
Q22	0.1	0.3	0.5	0.1	0	0	0
Q23	0	0.1	0.6	0.1	0.2	0	0
Q24	0	0.1	0.4	0.4	0.1	0	0
Q25	0.1	0	0.1	0.1	0.5	0.2	0
Q26	0.1	0	0.3	0	0.4	0.2	0
Q27	0.2	0.4	0.3	0.1	0	0	0
Q28	0	0	0	0.6	0.3	0.1	0
Q29	0	0.1	0.2	0.5	0.2	0	0
Q30	0	0	0	0.4	0.2	0.4	0

Table 5.3: The responses of the employees of the UK subsidiary to the culture-statement questionnaire (highlighted statements show most frequent)

Here, I analyse the statements that were the most frequent amongst the 10 employees (highlighted in the table using grey).

Firstly, costs were a major concern for the company (100%) as well as the job of the employees, rather than the employees themselves (80%) (appendix 5.17 charts1 and 15). Secondly, all employees disagreed with the statement that deadlines were loose and flexible (100%). They believed that the policies and procedures were very formal (100%) (appendix 5.17 charts 3 and 6). However, employees argued that people within the subsidiary were treated fairly, independently of their educational background, age, gender and race (100%)

and that newly hired people feel at home and adapt easily (90%) (appendix 5.17, charts 10 and 12). Furthermore, employees believe that people who achieved good results were rewarded and recognised (90%) (appendix 5.17 chart 16). In general most of the employees of the UK subsidiary felt that it is a good place to work (90%) (appendix 5.17 chart 27).

#### 5.4.1.3 The culture of the German subsidiary

The German subsidiary's web site was the web site for the entire pharmaceutical organisation and did not include specific information about the subsidiary. In addition, there was no mission statement in the subsidiary, but there was one on the web site, which again was referred to the overall company. The subsidiary that I visited was one of 10 in Germany. It employed approximately 180 employees and most of them worked in sales, administration and marketing. The German subsidiary supplied laboratory equipment as well as special chemicals to a variety of markets. It was located in a small city in Germany, west of Munich.

From the observations made when visiting the German subsidiary, several observations about the culture were made (see appendix 5.7 for the complete list of observations. Please note that the number in brackets, following each sentence, corresponds to the observation number of the list in the appendix 5. 7).

The sales office and the warehouse were both situated in a new and luxurious building (1), outside the centre of the city (2). The building belonged entirely to the company alone (3). Most of the offices were open plan (4) and only higher-level managers had their own office (5). All offices were very well-equipped; both in terms of furniture and technology (21) and everything seemed very well organised (22). There was one common area available for the employees (6), which was a kitchen and a seating room (7). There was no restaurant (8) and most of the employees seemed to make use of the kitchen to prepare their lunch (9). Dress code was very formal – suits only (10), although they did not seem to interact in person with clients (11). There were no obvious company logos (19) and no mission statement visible (20).

The climate within the Germany subsidiary can be described as formal. The employees were quite formal to each other (12) and interacted in the same way as they did with their superiors (13). The same held for the guests (14). The only informal interaction observed was in the common room/kitchen where groups of employees were preparing their food together (15). Moreover, guests did not have to sign in (16), as there was no reception area or lobby (17). It



was assumed that guests did not have unrestricted access, as they were accompanied by an employee at all times during their visit (18).

The responses of the interviewees to the culture-related questionnaire provided evidence of the employees' perception of the culture. Four culture-related questionnaires were returned. Table 5.4 shows the dispersion of responses for all 30 statements (shown in decimalised values).

	A: Strongly Agree	B: Agree	C: Tend to agree	D: Neutral	E: Tend to disagree	F: Disagree	G: Strongly disagree
Q1	0	0	0.25	0.5	0.25	0	0
Q2	0	0.5	0.5	0	0	0	0
Q3	0	0.5	0	0.25	0	0.25	0
Q4	0	0	0.5	0.5	0	0	0
Q5	0	0.25	0	0.75	0	0	0
Q6	0	0.25	0	0.5	0	0.25	0
Q7	0	0.5	0.5	0	0	0	0
Q8	0	0	0.25	0.5	0.25	0	0
Q9	0	0	0	0.25	0.25	0.5	0
Q10	0.25	0	0	0.75	0	0	0
Q11	0	0	0	0.75	0.25	0	0
Q12	0	0.75	0.25	0	0	0	0
Q13	0	0.5	0.25	0.25	0	0	0
Q14	0	0.75	0	0.25	0	0	0
Q15	0.25	0.25	0	0.5	0	0	0
Q16	0.25	0	0.25	0.5	0	0	0
Q17	0	0	0	0.25	0	0	0.75
Q18	0	0.25	0.25	0.25	0	0.25	0
Q19	0.25	0.75	0	0	0	0	0
Q20	0	0.5	0	0.25	0.25	0	0
Q21	0	0.75	0.25	0	0	0	0
Q22	0.25	0.5	0.25	0	0	0	0
Q23	0.25	0.75	0	0	0	0	0
Q24	0	0.25	0.25	0.5	0	0	0
Q25	0	0.5	0.5	0	0	0	0
Q26	0	0.5	0.25	0	0.25	0	0
Q27	0	1	0	0	0	0	0
Q28	0	0	0.25	0.75	0	0	0
Q29	0	0	0.5	0.25	0.25	0	0
Q30	0	0	0	0.25	0.25	0.5	0

Table 5.4: The responses of the employees of the German subsidiary to the culture-statement questionnaire (highlighted statements show most frequent)



Firstly, the employees felt that long-term results were more valued than short-term results (75%) and if they were good, they felt that they were rewarded for them (100%) (appendix 5.17 charts 2 and 9). Furthermore the employees, although they believed that the subsidiary did not have a very structured career path (75%), felt that the company encouraged personal development (100%) (appendix 5.17 charts 25 and 30). They also felt that their job roles made them work more as individuals than in groups (100%). The company organised many social events to which everyone was invited (75%) (appendix 5.17 charts 14 and 19). Finally, most of them felt that costs were not a major concern for the company (50%) and that, in general, the subsidiary practised what it advocated (100%) (appendix 5.17 charts 15 and 24).

## **5.4.2 The SAP implementations**

In this section, I describe the SAP implementation process that took place in each subsidiary based on evidence elicited using the SAP implementation questions quoted in appendix 5.4. The transcribed interviews are included in appendix 5.11 for the Scandinavian, 5.12 for the UK and 5.13 for the German subsidiary. The Scandinavian and German interview transcripts were translated into English.

### **5.4.2.1 The implementation process at the Scandinavian subsidiary**

The Scandinavian subsidiary, which was based in Sweden, has been live on SAP 4.5 since May 1999, and had only used R/3 for six months when the study was carried out. The previous system was a terminal-based bespoke system that had been used for over 10 years (quote from the interview with the IT staff working with the Material Management module). During these 10 years, continuous amendments were made to this old system, which made it quick to use and popular amongst the employees as they were very comfortable using it (quote from the interview with the IT staff working with Material Management module). It was nevertheless old-fashioned and the possibility of further developments was limited.

One year before going live with SAP, consultants, from a Scandinavian SAP implementation partner, came into the subsidiary to start the configuration of and training on the system. The involvement of the consultants declined after the system went live. However, after six months of using the R/3 system, full-time consultants were employed to work again with configuration issues. There was a widespread disappointment within the subsidiary with the implementation partner and many employees complained about insufficient support and the consultants' lack of knowledge of the business. As the SD (Sales & Distribution module)



systems' developer put it: *"The consultants focused only on how to put up the system not the business, I am a user and I do know how the system should work in the organisation....They used a language no one understood... If we had to do it all again, we would set up the system very differently"*. A marketing key user added, *"If you ask a consultant what is the use of this, they don't know, nobody knows, so why do I have to put it in"*. To overcome these problems an independent expert on SAP implementations was hired to deal with user questions and to support their needs. This expert was highly appreciated and the company was, to a large extent, depending on his knowledge by the time that we visited the subsidiary.

Only the IT staff attended SAP-led courses. They thought that the courses were too general and could not be applied to the company's specific needs. Hence, they decided to provide in-house training for the key users, who would then support their colleagues. Six months after the implementation the majority of the training was being done in-house. The overall view was that the training could be more extensive. This was especially true in the warehouse department, as stated by the WM (Warehouse Management module) systems developer. *"The end user should have received more training, they needed practical use on the system. The same holds for the administration employees, the boss and the middle managers; they should have all received more training than they did"*. The personnel in the warehouse were not sufficiently skilled in the system when they went live and during the first month after the implementation they mainly tried to survive and teach the users how to interact with the new system first of all. The reason behind this was that they did not have enough time to train the personnel on the SAP system. According to the warehouse manager, the warehouse moved to a new location one year before the SAP implementation, which resulted in most of the employees resigning. A lot of time and effort was spent in training the new warehouse personnel on the old system. Hence, when the SAP system was introduced, they did not have enough time to train them, as a lot of time had been lost because of the move and the training of the new personnel on the old system (Warehouse Manager).

In general, the Scandinavian subsidiary tried to find a balance between changing the business processes to fit the system and amending the SAP system to fit the company's specific requirements. In reality there was a reluctance to change the business processes. According to the implementation consultant, *"the subsidiary, as many other companies, was unaware of the their own value-added processes, something which complicated the reengineering process"*.

The workflow in the warehouse was changed very little in order to be consistent with SAP (IT staff working with WM). The general view was that the work in the warehouse was similar to

how it was prior to the SAP implementation, and that the system was configured to fit the work rather than vice versa. *“In the warehouse for example the main work is the same but there are some minor changes. We used the SAP standard of how to work in the warehouse”* (WM systems developer). Several subsystems were built to interface with the SAP system, for example creating and printing labels that indicated how the material should be handled. SAP supported this functionality but in order to obtain it, too much effort and time was required in configuring the old data to the SAP system. Moreover, their plan was to use solely SAP’s functionality by autumn 2000, since all systems had to be compliant with the new inter-European organisation. In the other departments the main processes were the same as prior to the implementation and configurations were made where standard SAP could not support the business needs.

The switch from the old system to SAP R/3 was generally regarded as successful, and the main problems reported were from the warehouse. Six months after the implementation every department was still struggling with problems arising from the implementation. The efficiency in the warehouse had decreased as a result of increased administrative work, longer time to execute each operation, more tasks involved in each operation and the need to hire more personnel. Many employees in the warehouse experienced work related stress and frustration. According to the warehouse manager *“we had a lot of work-related stress, the employees in the warehouse have worked a lot of over-time and had no holidays for a very long time”*. Other departments, such as sales and marketing, also experienced efficiency problems as a consequence of time spent on non-value added tasks like registration, and dealing with difficulties using the system.

In contrast, reported benefits from the system were better to access more information on the finance side. A general view is that *“SAP R/3 is too complex for a distribution company and that parent company that imposed the system on its subsidiaries did not take this into account”* (IT staff working with SD).

#### 5.4.2.2 The implementation process at the UK subsidiary

The UK subsidiary started their implementation of SAP R/3 in 1994. The previous system was a non-Windows based bespoke system that enabled little interaction between the functions. In total six SAP modules and some sub modules were implemented. The modules were implemented in steps, starting with Finance (FI) which went live in 1995. Sales and Distribution (SD) and Materials Management (MM) were first put in for a small division,



which enabled thorough testing and adaptation before the whole company went live. The whole company has been live on SAP version 3.F since November 1998.

The UK branch invested a lot of resources and effort prior to the implementation. These included extensive involvement of end-users, a thorough training programme and working simulations. All employees were involved in brainstorming sessions in which they were encouraged to state what they required from the new system. *"We had loads and loads of brainstorming sessions where we said to people, 'well we have got a new system, what do you think we need to handle our business in the best way'"* (Key user sales). Based on these requirements a detailed script with the desired functionality was presented to SAP. For approximately one week, seventy people from the business evaluated the SAP's functionality against the script. Overall the fit was satisfactory. According to the IT development manager, *"FI was good, but warehousing (WM) was very weak to start with and we did a lot of development there to make it better"*. It was stated that too much time was spent eliciting requirements instead of evaluating SAP. *"There was no real reason to elicit the requirements as SAP was imposed on the subsidiary by the parent company"* (IT development manager). The end users were presented with the idea of getting a new system that would fit exactly their requirements. However, this resulted in a negative atmosphere about the system as it could not deliver all the user requirements. *"The only problem with this modelling was that because everyone got so involved, and expressed their wishes and requirements about the functionality, when the system got in they got disappointed, as it can't do everything that they wished for"* (IT development manager).

The training was mainly done in-house as it was felt that employees understood better the training needs of the subsidiary. Key users were trained on a specific module, in order to support and train other members of staff. Individual matrices were created for each staff member and the training was altered to fit that specific user's needs. In general, the users were very satisfied with the training offered and with the post implementation support. *"The fact that the training was put together by our own people was absolutely phenomenal"* (warehouse site manager). Moreover, according to the warehouse site manager *"a stunning amount of work was done for the training, and then that was delivered to the warehouse and to the office"*.

Three weekends of simulations were executed prior to the implementation. During the simulations, all staff worked for one normal day with the new system to discover and alter faults in the system before going live. Reported problems were that the system was not quick

enough (warehouse site manager), that the paperwork was not coming off the system and that some of the data was not transferred correctly (key user sales).

The UK subsidiary chose to configure SAP to fit their business processes rather than to adopt the processes supported the system. This resulted, however, in an extensive configuration of R/3 to fit the company's specific requirement for all modules, and especially for WM. The most obvious problem that this caused was incompatibility with a new release of R/3. The plan was that, in November 2000, the old version would be upgraded to 4.5, and the year after to 4.6. *"There is the fear that the changes may not be able to get transferred to the new releases and as a result a lot of work will be required in order to reapply those changes"* (key user sales).

During the first months after the SAP implementation, there were performance problems in the warehouse and sales department that resulted in an initial service dip. The cause was mainly problems on the delivery side, which had a knock on effect on the rest of the organisation, in addition to some efficiency problems in the warehouse. According to the warehouse site manager, *"the company encountered customer reactions, particularly from the distributors and dealers, a couple of months after we had gone live. This made us realise that the service level that they said that they were experiencing was not satisfactory. So we had to put a major service recovery plan in to it"*. It took an estimated 6-8 weeks to get stability internally, and approximately another two or three months to get the stability back with the customers.

After two years of use, the majority of the system's users were pleased with its functionality and considered the implementation to be a positive aspect for the company (key user sales, warehouse site manager). The sales department still had reduced efficiency levels with increased times to process each order as a result of the SAP implementation. In the warehouse, the SAP implementation made the system available for longer periods during the day, which enabled a change in the shifts. The changed shifts resulted in an increased efficiency in the warehouse as a consequence of improved processes and longer system availability.

#### 5.4.2.3 The implementation process at the German subsidiary

The German subsidiary had been live on SAP R/3 since January 1994. The previous system was a very structured bespoke system that had been configured to fit the subsidiary's needs exactly. Employees were used to the old system, and did experience problems when first



using R/3, although the degree of change, according to employees, was not large. *“This was because the other previous old software of the subsidiary was very structured, so the change to SAP, which is a very structured software anyway, did not cause any problems in like changing the way from how work was done before to now”* (IT development manager). *“However SAP is more professional, so the subsidiary has become more professional as well”* (IT development manager). According to the IT development manager, *“SAP fits perfectly the way our company works, it is more professional and as a results we are more professional now”*

A committee, put together by the parent company, to research and find the best available ERP solution on the market for the company as a whole, including its subsidiaries, decided on the implementation process and the ERP package. SAP was first implemented at the parent company in Germany, in 1992, then in the different subsidiaries across the country. When SAP was implemented at the visiting subsidiary, regular support was provided by the parent company, and many meeting were held to discuss and solve any problems that may have arisen.

The subsidiary changed its processes to fit to the best business process prescribed by SAP. *“In order to avoid possible problems we changed our processes to the ones suggested by the SAP software. If you want to get the best out of the SAP software, you should adapt your processes to what the software suggests”* (IT development manager). In the employees’ opinion, the change was not big; the processes were very similar. At the time of the study, any problems encountered occurred usually because of changes in the nature of business, which in turn brought changes to the processes which had to be configured to fit SAP (IT development manager).

In general, most of the employees received full training at the SAP training centres. Only a few, because of job pressures, preferred to be trained by their colleagues. *“We were all offered proper training at the SAP training centres, but some of us because of the work-load decided to get trained by the others”* (SD key user). Additionally, all employees were re-trained each time a new version of SAP was implemented. Overall, the employees were happy with the training received.

On the whole, the subsidiary did not face any problems with the implementation of the SAP system, as argued by the employees (IT development manager, key user SD and key user MM). One of the few problems faced was with the layout of the sales screen, which they configured and was very similar to the latest version of R/3 4.6 (IT development manager).

During interviews, most interviewees reported benefits rather than problems. The most commonly reported benefit was that R/3 is very hierarchically structured, which helped the subsidiary become more hierarchical, which they considered was exactly what they needed. *“The whole company became more hierarchical and united. Before there used to be just small divisions, which were quite independent. The hierarchy is much better as work gets more regulated and everything is more structured. Independence didn’t guarantee that the work was done better, now it is. It is much easier to be in a hierarchical company”* (IT development manager).

### **5.4.3 The problems that arose from the SAP implementations**

Problems that arose at the 3 subsidiaries as a result of the SAP implementations were elicited by using the SAP implementation questions of the method. All the problems are presented in table 5.5. This section reviews all the problems reported at the 3 subsidiaries, then focus more on those problems related to culture.

In the Scandinavian subsidiary the total number of problems elicited was 8, of which only 1 was not culture-related, namely the loss of business opportunities (table 5.5). There were many reasons for this problem, including decreased efficiency in the warehouse, unproductive staff time and uncertainty of how to use the system. From the 7 culture-related problems, 3 related to the implementation of the WH (warehouse) module and 3 related to the implementation of the SD (sales & distribution) module. The 7 culture-related problems are discussed later in this chapter (section 5.4.3.1).

In the UK subsidiary the total number of problems elicited was 11, of which 4 were culture related (see table 5.5). The 7 non-culture related problems were:

1. Extensive configuration of warehouse module because a lot of necessary functionality was missing, for instance the subsidiary introduced and interfaced another sub-system to allow the use of bar-coding.
2. Deteriorated performance because of the problems in the warehouse and the sales order entries, for example delayed or not completed deliveries to customers.
3. Lack of foreign trade functionality, especially legal requirements. Being a distributor of hazardous materials within and outside the UK, the company has to conform to a wide range of national and international safety regulations. For instance, it is required that the



licences for each chemical can be specified on the sales order, but the SAP system does not support this level of detail.

4. R/3 does not keep up with British legislation, as it gets regularly updated and the changes are not incorporated into the system. The system keeps up with German legislation, but in the UK, a company has to configure the system by itself to keep up to date.
5. R/3 is inflexible when checking availability of materials because R/3 relies on what is in the system, and if this is not accurate, e.g. if delays or changes occur in the warehouse, then it gives a wrong delivery date.
6. R/3 is inflexible when supporting deliveries. The system puts all materials into a single delivery, although certain materials are incompatible and dangerous to be delivered together.
7. Configuration makes upgrades of R/3 difficult because it might lead to problems of including and converting these changes into a new version. A lot of configuration and coding makes it more difficult when you need to do an upgrade, as you need to reapply and check if the changes still work.

From the 4 culture-related problems, 2 related to the implementation of the WH (warehouse) module and 2 related to the implementation of the SD (sales & distribution) module. The 4 culture-related problems are discussed later in this chapter (section 5.3.4.2).

In the German subsidiary, 3 were identified in total and all of them were not culture-related ones (see table 5.5). The 3 non-culture-related problems were:

1. Familiarisation with R/3 because the previous system was bespoke and R/3 is Windows based, so employees had to familiarise themselves with R/3.
2. Changes in the nature of the business are reflected in the business processes, which have to be configured into R/3 to reflect those changes.
3. Screen navigation is hard because it requires browsing through many screens in order to process a sales order entry.

Problems/ Subsidiary	Scandinavian	UK	German
<b>Total</b>	<b>8</b>	<b>11</b>	<b>3</b>
<b>Non culture-related</b>	1.Lost business opportunities	1.Extensive configuration of warehouse module 2.Deteriorated performance 3.Lack of foreign trade functionality 4.R/3 does not keep up with British legislation 5.R/3 inflexible in checking availability of materials 6.R/3 inflexible in deliveries with large number of materials 7.Configuration makes upgrades of R/3 difficult	1.Familiarisation with R/3 2.Changes in the nature of business 3.Screen navigation
<b>Culture-related</b>	<b>7</b>	<b>4</b>	<b>0</b>
<b>WM module</b>	1.Lack of training 2.Job satisfaction 3.SAP package complexity	1.Failure to meet stakeholder requirements 2.Unsuitable operating assumptions	0
<b>S&amp;D module</b>	1.Inaccurate data entry 2.Unproductive staff time 3.Poor screen navigation 4.Poor customer service	1.Poor screen navigation 2.Hidden functionality	0

Table: 5.5 Summary of all problems faced in the three subsidiaries.

#### 5.4.3.1 The Scandinavian subsidiary and its problems

Seven culture-related problems were identified in the Scandinavian subsidiary and related to procedures, increased workload, lack of functionality and lack of training. I present them in 3 parts. I start with a textual description of each problem, using the relevant data identified from the interview transcripts then I go on to discuss how each instantiation was produced and finally, introduce it.

The first 3 problems relate with the implementation of the WM (warehouse) module

##### 1. Lack of training

In one transcript segment, the problem of lack of training was identified. The IT WM developer said *“the warehouse personnel expected that they would have received adequate training to use the new system and would have also used it before going live”*. However, he believed that *“there was not enough training nor any practical experience for the warehouse personnel”*. As a result, the warehouse personnel were making mistakes and could not use the



system effectively. *“The users were not as skilled as they should have been... It can be very hard for the users to understand the links, the problems can be very big but you don’t see it that way as an end user. All that until they become big and then you need a lot of work and support”* (IT WM developer). According to the IT WM developer, *“if the employees were well trained and had enough practical experience, then they would have been able to use R/3 efficiently and recognise potential problems in the physical flow”* (IT WM developer). However, this was not the case and *“one of the big problems is that if you work in the warehouse you need to see the physical flow so it’s hard for them to imagine how it will look and function in reality if they just sit in front of the screen”*. He added, *“the biggest problem was the time issue, as they started too late to train people. And if they needed more training it was hard to arrange that because it was too close to the production start”* (IT WM developer). When the warehouse employees tried performing their day-to-day actions, their expectation got violated and the problem of lack of training arose. This problem was critical for the efficiency of the SAP implementation at the subsidiary, because the employees were making mistakes and could not use the new system effectively.

Warehouse personnel expected to receive adequate training and practical experience on R/3. This is an expectation on the new system, and hence a norm. For the expectation to be met, ‘it is important that the personnel receive adequate training and practical experience before going live’, which is the value. The belief explains why the agents have this expectation and it was found that if the employees were well trained and had enough practical experience on the system, then they would have been able to use R/3 efficiently and recognise potential problems in the physical flow. The problem was modelled using the meta-schema presented in chapter 3.

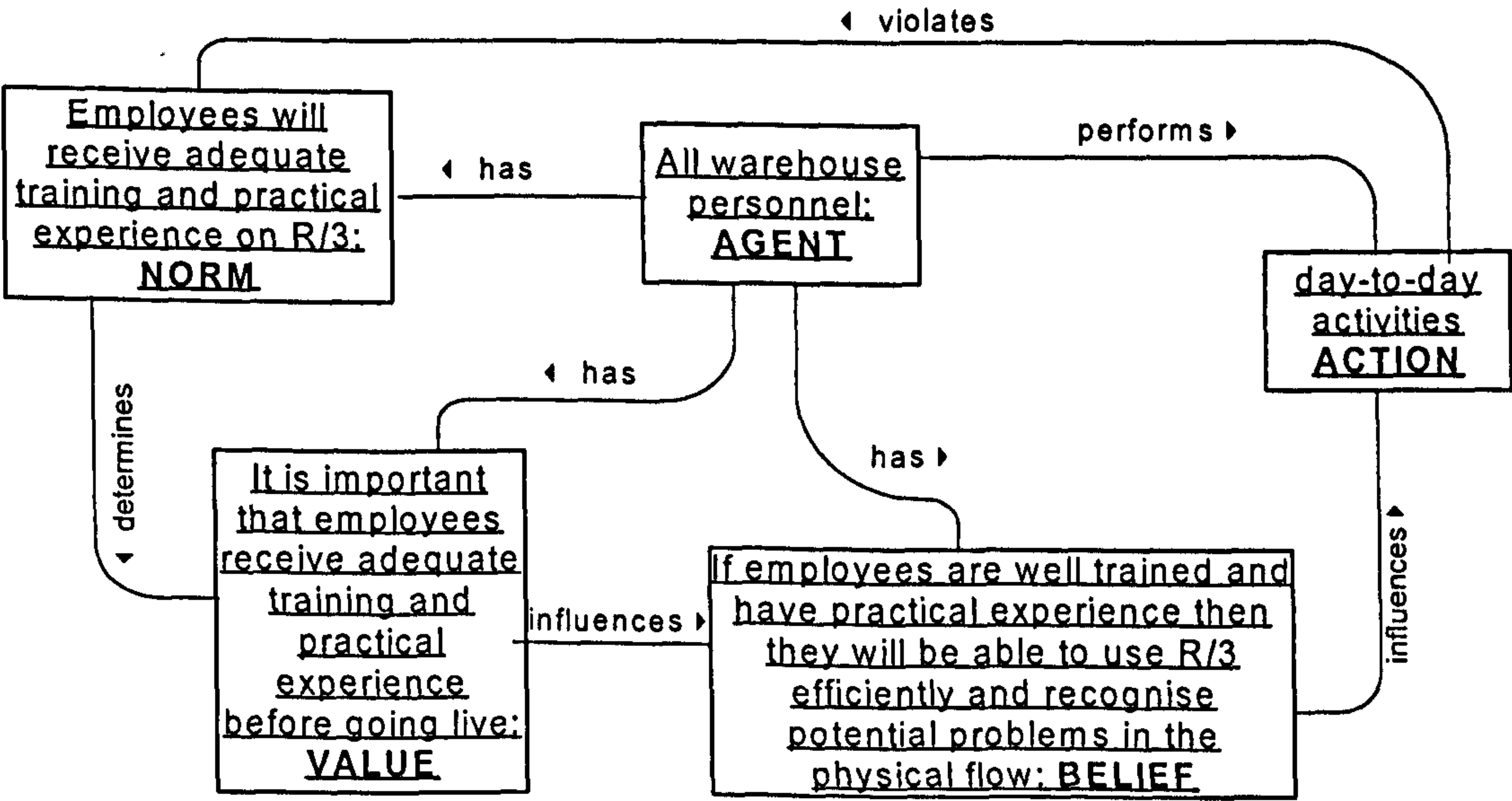


Fig 5.1: An instantiation describing facets of culture related to staff training in the Scandinavian warehouse

## 2. Job satisfaction

In another transcript segment, warehouse personnel reported that they were not satisfied with their job because of the changes the new system caused in their work. According to the IT WM developer, *“the climate was not good and they wanted to have the old system back ... they were really dissatisfied with their job”*. He believed that the reason was that warehouse personnel thought that they would continue working “out there” in the warehouse and performing mainly physical tasks such as moving products (IT WM developer). *“This is what they used to do before the new system and this is also what they wanted to do. If they wanted to do administrative work, they wouldn’t have worked in the warehouse in the first place. The warehouse employees always perceived their job to involve physical tasks”* (IT WM developer). However, the implementation of the R/3 system changed the nature of their job and *“the users now have more responsibilities - in the old system the users didn’t know the problems - we corrected them. But now they have to correct them by themselves”* (IT WM developer). This caused a lot of frustration in the warehouse personnel and unwillingness to use the system. *“Especially in the beginning the warehouse staff did not want to sit by the desk, they wanted to be out there in the warehouse”* (IT WM developer). According to him, *“the organisation was not ready to take that step, we needed more people that know how to work by the desk and not in the warehouse”*. This change in the nature of the job of the warehouse personnel because of the implementation of the R/3 system violated their norm and the problem of job satisfaction arose. This problem was critical for the efficiency of the SAP implementation at the subsidiary because the employees refused to accept the system.

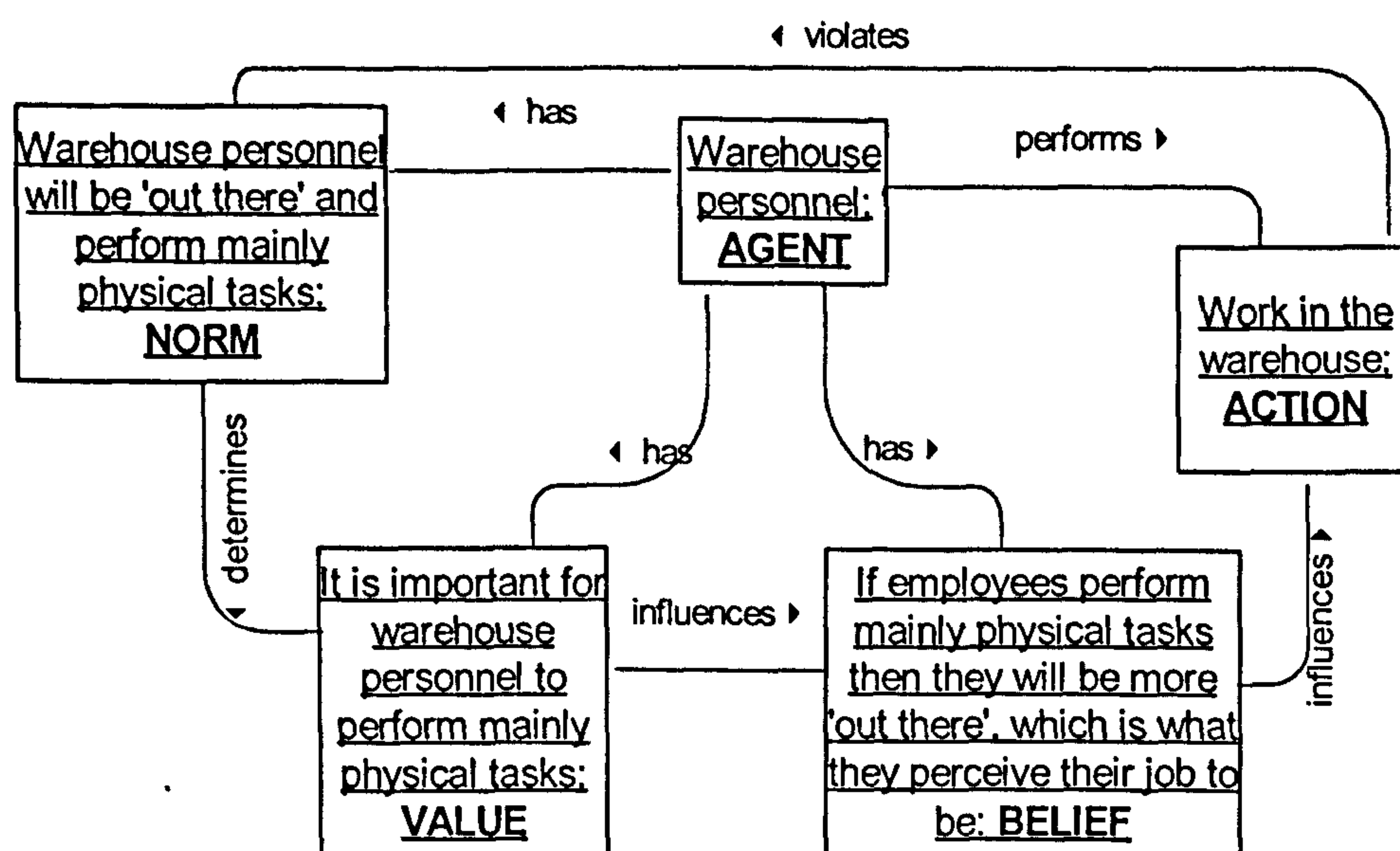


Fig: 5.2: An instantiation describing facets of culture relating to job satisfaction in the Scandinavian warehouse



Warehouse personnel expected that they would work ‘out there’ and perform mainly physical tasks. This is an expectation on the new system, and hence a norm. For the expectation to be met, ‘it is important that the warehouse personnel perform mainly physical tasks’, which is the value. The belief explains why the agents have this expectation and it was found that the employees at the warehouse believed that if they would perform physical tasks then they will be more ‘out there’ which is what they perceived their job responsibilities to be. The problem was modelled using the meta-schema presented in chapter 3.

### 3. SAP package complexity

Several stakeholders identified the SAP package itself as a source of problems. Before the implementation of R/3, the employees believed that the system suited their company and it would empower it (warehouse manager). However, there was a large number of employees who believed that this was not the case. End-users perceived it to be too complex for a distribution company. According to the marketing key user *“we bought a Jumbo when we needed a bicycle”*. Moreover, the IT SD developer stated that *“the system is mainly for a manufacturing company, it is not a warehouse system. It’s too complex for a distribution company like us”*. Furthermore, the warehouse manager believes that the system *“is too Germanic in the way it does things and I think this is also a factor why it doesn’t fit our company”*. All these views contributed to the fact that the system was not the right one. *“If we had a system that suited the organisation, maybe even the previous one, it would empower it and so we would be able to produce better results than at the moment. We realised how important it is for a company to have the right system”* (warehouse manager). Employees believed that the SAP system did not empower their organisation, as it was too complex and comprehensive. Employees were frustrated because they could not understand the system as it was not the right one and is too complex. *“I feel frustrated because I am trying to work with the system, although I don’t completely understand it, and for this reason I cannot produce the results I would have liked to”* (warehouse manager). When the employees tried performing their day-to-day activities, their expectation was violated and the problem of the complexity of the package arose. This problem was critical, because the system at that point did not empower the organization and the employees could not produce good results.

Employees expected that the system suits the organisation and it will empower it. This is an expectation on the new system, and hence a norm. For the expectation to be met, ‘it is important that the system suits the organisation’, which is the value. The belief explains why the agents have this expectation and it was found that the employees believed that if R/3 suits

the organisation, then it will empower it and so employees will be able to produce better results.

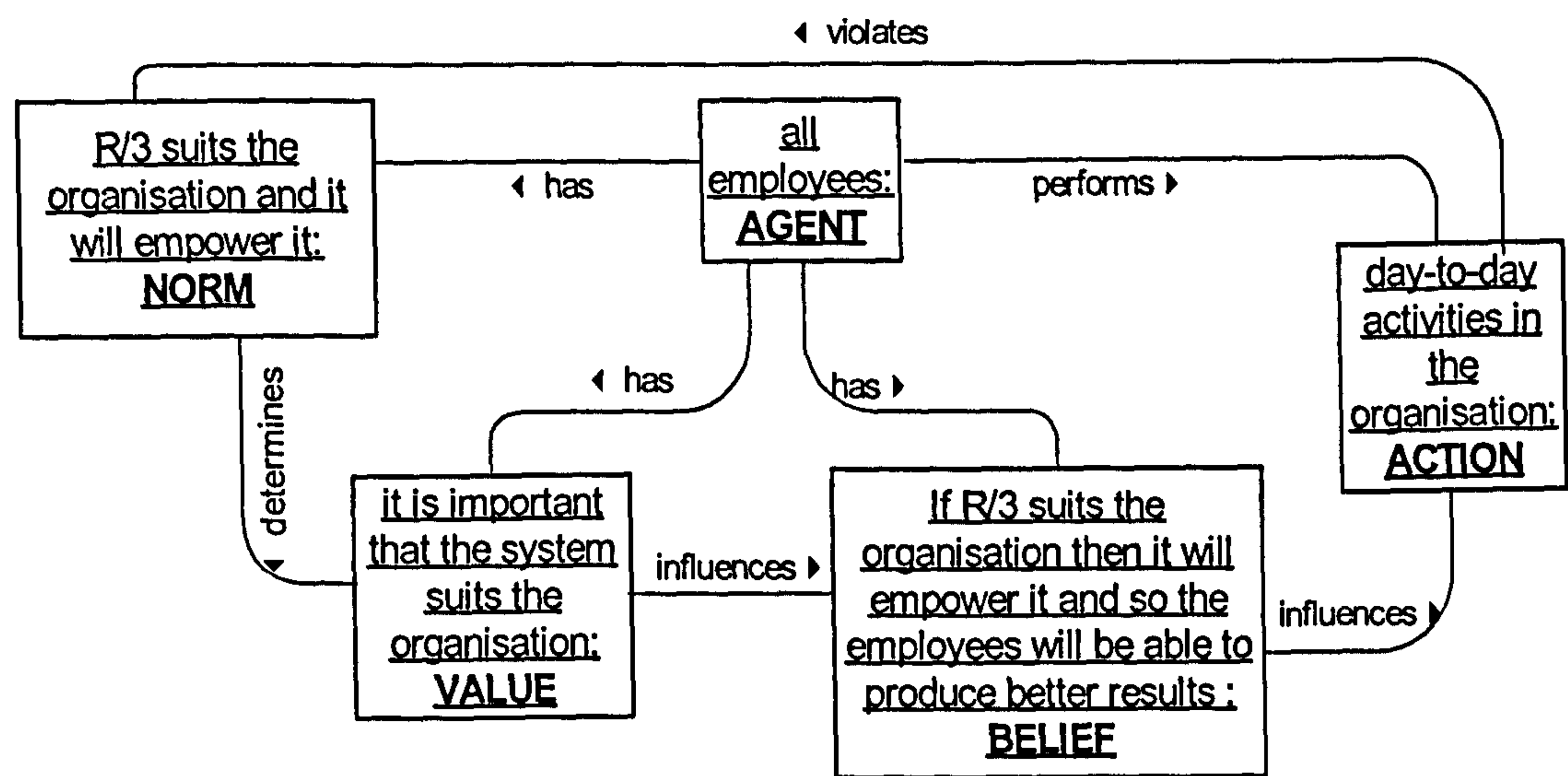


Fig 5.3: An instantiation describing facets of culture relating to the perceived complexity of the ERP package for the Scandinavian warehouse system

Scandinavian stakeholders also reported 4 important problems with the implemented sales & distribution module:

4. R/3 lacks flexibility

One problem that was elicited from sales and marketing personnel transcripts was the lack of flexibility of the R/3 system. Personnel in the sales & marketing departments believed before the implementation that *“the R/3 system will be flexible, and so it the delivery times would be also flexible”* (marketing key user). However, *“there are problems when you look at the delivery times. They are not the same as real times and not as short as they could have been ...we cannot tell the customer the exact delivery time, and very often the customer calls in and complains about not getting the products in time. Delivery times need to be as short as possible if you want to keep your customers or if you want to gain new ones”* (customer services manager). In general, the problem with the new system was that it did not allow flexible delivery times. The marketing key user believed that *“the R/3 system requires delivery times that are longer than real times ... all this because the system is not flexible enough... It is crazy!”*. The inaccurate data entry problem frustrated the employees of the subsidiary. According to the marketing key user, this *“lack of flexibility of the system makes delivery times rigid, which damages the company’s competitive advantage as we lose*



customers to the competitors that can provide quicker deliveries” (Marketing Key User). Employees of the sales and marketing department were really unhappy with this vital lack of functionality of the new system. When the employees registered delivery times into the system, their expectation was violated and the problem of the lack of flexibility of the system arose. This problem was critical for the SAP implementation, because flexible delivery times were critical for the subsidiary and its competitive advantage.

Sales and marketing personnel expected that the system would be flexible and thus allow flexible delivery times. This is an expectation on the new system, and hence a norm. For the expectation to be met, ‘it is important that the system is flexible’, which is the value. The belief explains why the agents have this expectation and it was found that the sales and marketing employees believed that if R/3 is flexible then delivery times will be flexible, which is important for competitive advantage.

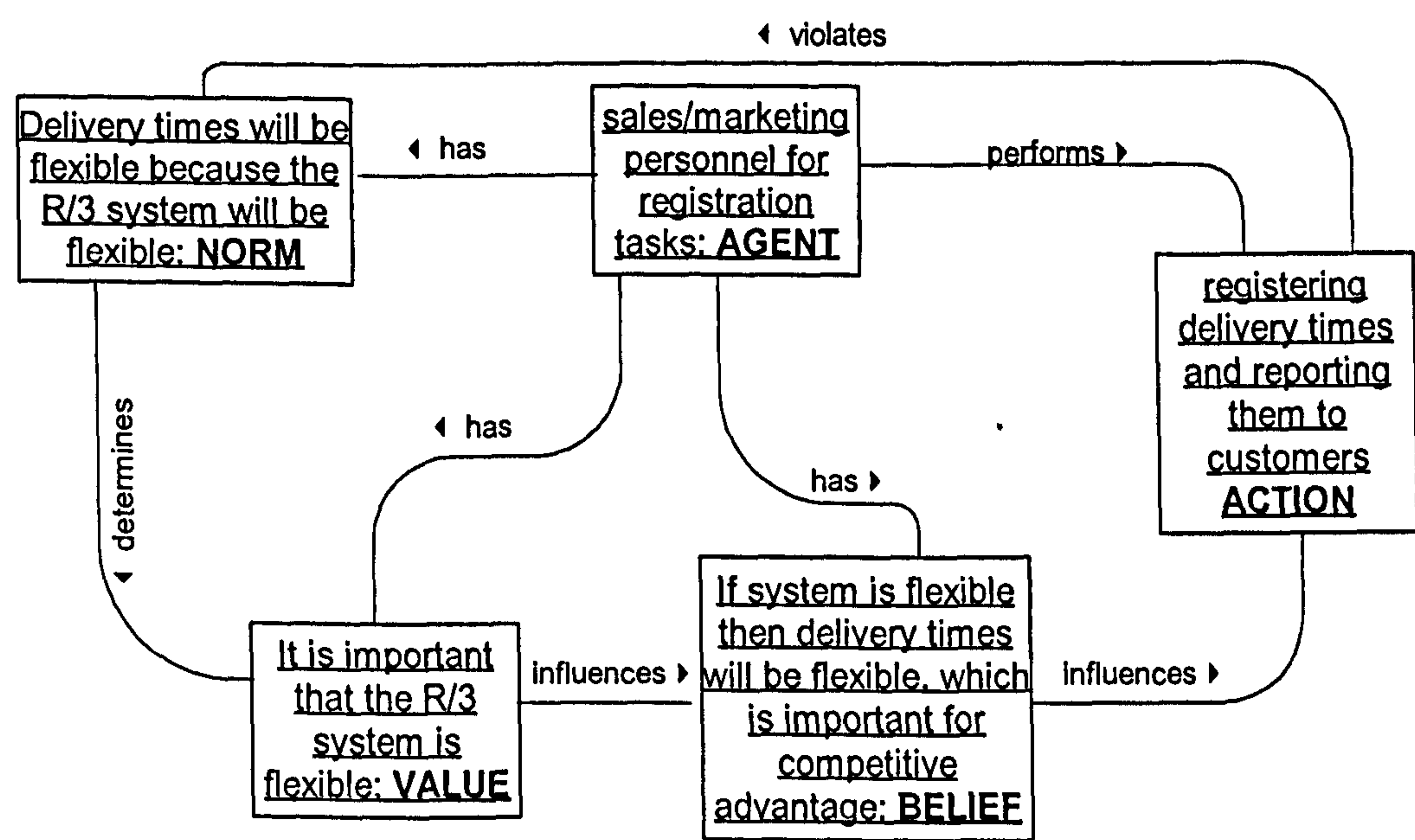


Fig. 5.4: An instantiation describing facets of culture relating to the problem of lack of flexibility of the R/3 system

### 5. Unproductive staff time

In another transcript segment, the problem of unproductive staff time was identified. The marketing key user believed “the new system would be more effective than the old system and so the employees would be more productive, which will result in the organisation as a whole to be more productive and effective”. However, he realised that “we now have a system that takes lots of power from the organisation in terms of time and effort”. That is really crazy, we

have estimated that we use 30% of our manpower just to data registration” (key user marketing). The administrative staff argued that “I am not as productive in my work as I used to be. I don’t like it. I want to feel that what I am doing day-to-day is of use and good worth”. She believed that it is because everything takes much more time, as it is far more difficult to do everything (administrative staff). The marketing key user adds “Now there is a lot of typing to go back and forth, the time, and it is hard to take the data with you from one screen to the other. I cannot see the use of all this complicated data entry. It feels like I was wasting time”. This change in the nature of the action of the agents, because of the implementation of the R/3 system, violated their norm and the problem of unproductive staff time arose. This problem was critical for the efficiency of the SAP implementation at the subsidiary, because the employees lost motivation and interest in their job.

Sales and marketing personnel expected that they would be more productive than before because the R/3 system will be more effective than the old one. This is an expectation on the new system, and hence a norm. For the expectation to be met, ‘it is important that the new system is more effective than the old one’, which is the value. The belief explains why the agents have this expectation and it was found that the sales and marketing employees believed that if the system is more effective then they would be able to be more productive and so the organisation as a whole.

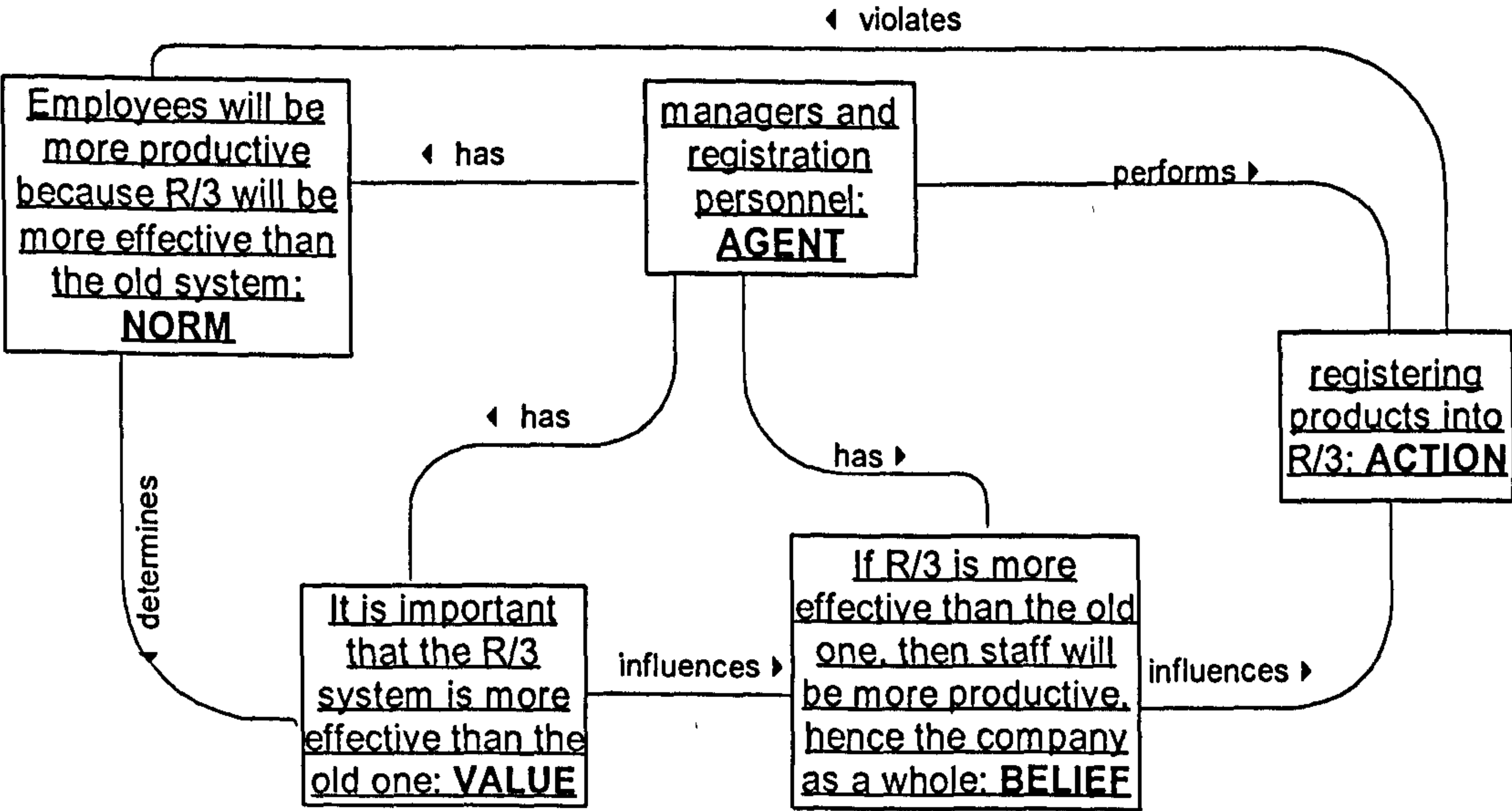


Fig 5.5: An instantiation describing facets of culture relating to additional, unproductive staff time being needed to use the R/3 system



## 6. Poor screen navigation

Stakeholders in all departments in the Scandinavian subsidiary based in Sweden, and especially in the sales and marketing department, felt that *“the advantages of data integration offered by the SAP package were lost as there are too many screens to navigate and consequently too much time is spent on different tasks”* (marketing manager). According to the IT SD developer *“the system is too complex and to find the pages that suit your needs is often pure luck. There are so many screens one has to navigate in order to find what they are looking for”*. The marketing manager had the same view, *“The old system had one screen with all the information you were looking for, whereas with R/3 you have to go through different screens to find what you want which also takes far more time”*. In addition, employees did not understand why the system did not provide a holistic view of the data on one screen. *“Many people here cannot understand where all this information goes and why we cannot see it on a screen”* (marketing key user). The problem of poor screen navigation has caused a lot of disappointment amongst employees, which has also led to them using the old system sometimes. *“The things are hard to see in the new system and they are very easy to see in the old system and that is why we use it still all the time”* (administrative staff). Before the implementation, *“employees, including me, expected the R/3 system to be easy to navigate and provide a holistic view of the data. It was very disappointing when we realised that the opposite was true”* (marketing manager). Everytime the employees were interacting with the system, the problem of poor screen navigation arose and their expectation was violated. This problem was critical for the efficiency of the SAP implementation at the subsidiary, because the employees were disappointed and many of their tasks took so much longer that they sometimes decided to use the old system.

Sales and marketing personnel expected that the system would be easy to navigate, as it will provide a holistic view of the data. This is an expectation on the new system, and hence a norm. For the expectation to be met, ‘it is important that the new system provides a holistic view of the data’, which is the value. The belief explains why the agents have this expectation and it was found that the sales and marketing employees believed that if the system provides a holistic view of the data, then it will be easy to navigate and so less time will be spent on different tasks. The problem was modelled using the meta-schema presented in chapter 3.

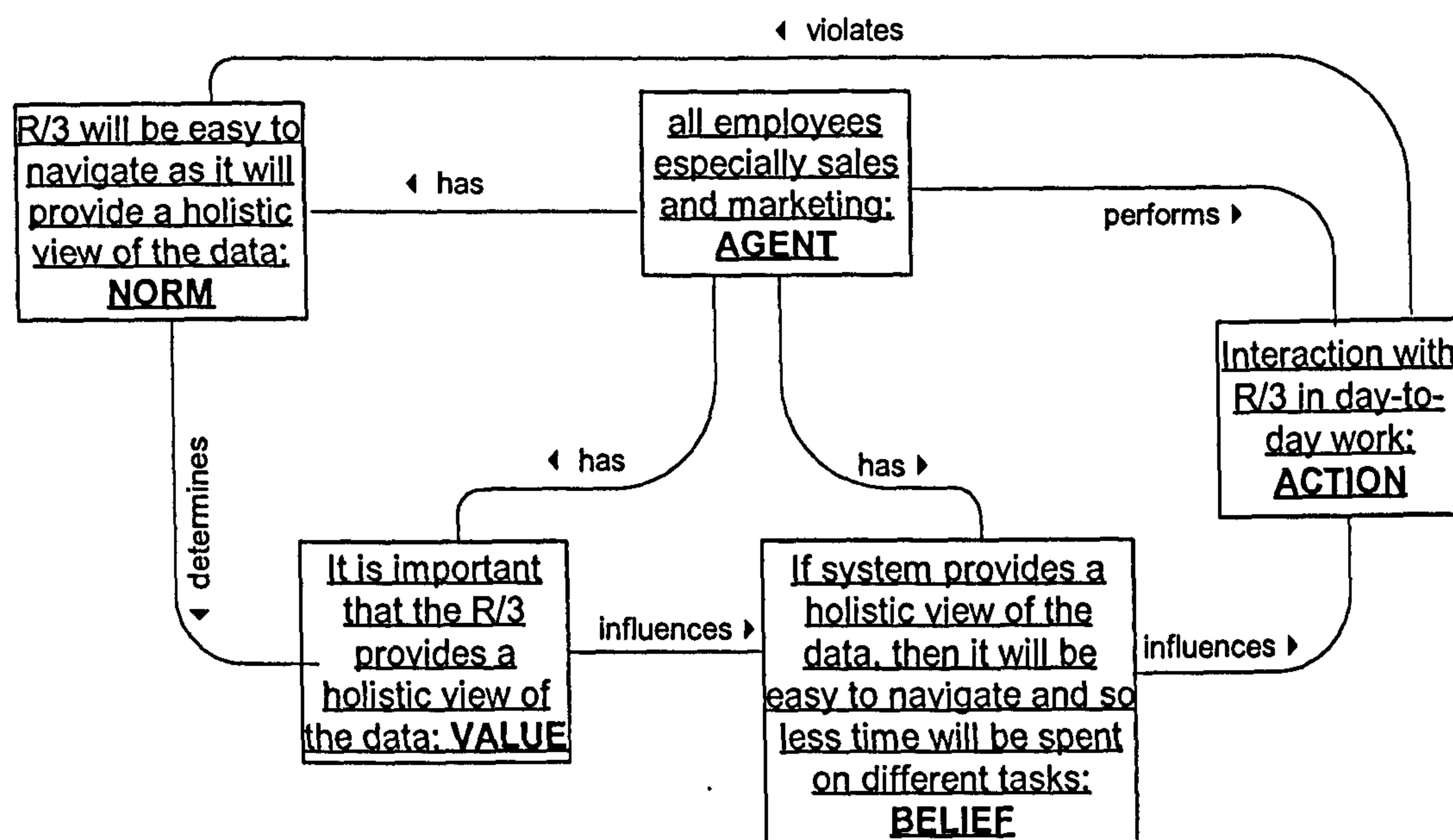


Fig 5.6: An instantiation describing facets of culture relating to screen navigation problems in R/3

## 7. Poor customer service

In another transcript segment, the importance of good customer service was identified. *“Employees expected customer service levels to improve as information would be easy to find in the new system and so no delays would occur when dealing with customers”* (SD key user). However, the new system was not delivering such a level of service. According to the SD key user, *“information is very hard to find in the system and if you have an order with 40-50 items, the system becomes very slow as well. So, you have to start talking about the weather, and things to the customers, as they get impatient. The system at the moment doesn’t help keep our customers or gain new ones. Our customer service has become worse and customers know that, which is not a good thing for a company like ours; I had to lie and lie to the customers all the time and it was very stressful”*. Additionally, because of the aforementioned problem with the delivery times, the customer services manager said *“we cannot tell the customer the exact delivery time, and it is very often that the customer calls in and complains about not getting the products in time. This is crucial for the company’s competitive advantage”*. All these problems resulted in the employees believing that the new system was not offering a quick and good service to its customers, which is very important for a company. Everytime the employees were dealing with a customer, their expectation was violated and poor customer service arose.



Sales and marketing personnel expected that customer service will improve because information will be easy to find in the system. This is an expectation on the new system, and hence a norm. For the expectation to be met, 'it is important that information will be easy to find in the R/3', which is the value. The belief explains why the agents have this expectation and it was found that the sales and marketing employees believed that if information is easy to find in the system, then customer service would improve which is crucial for the company's competitive advantage.

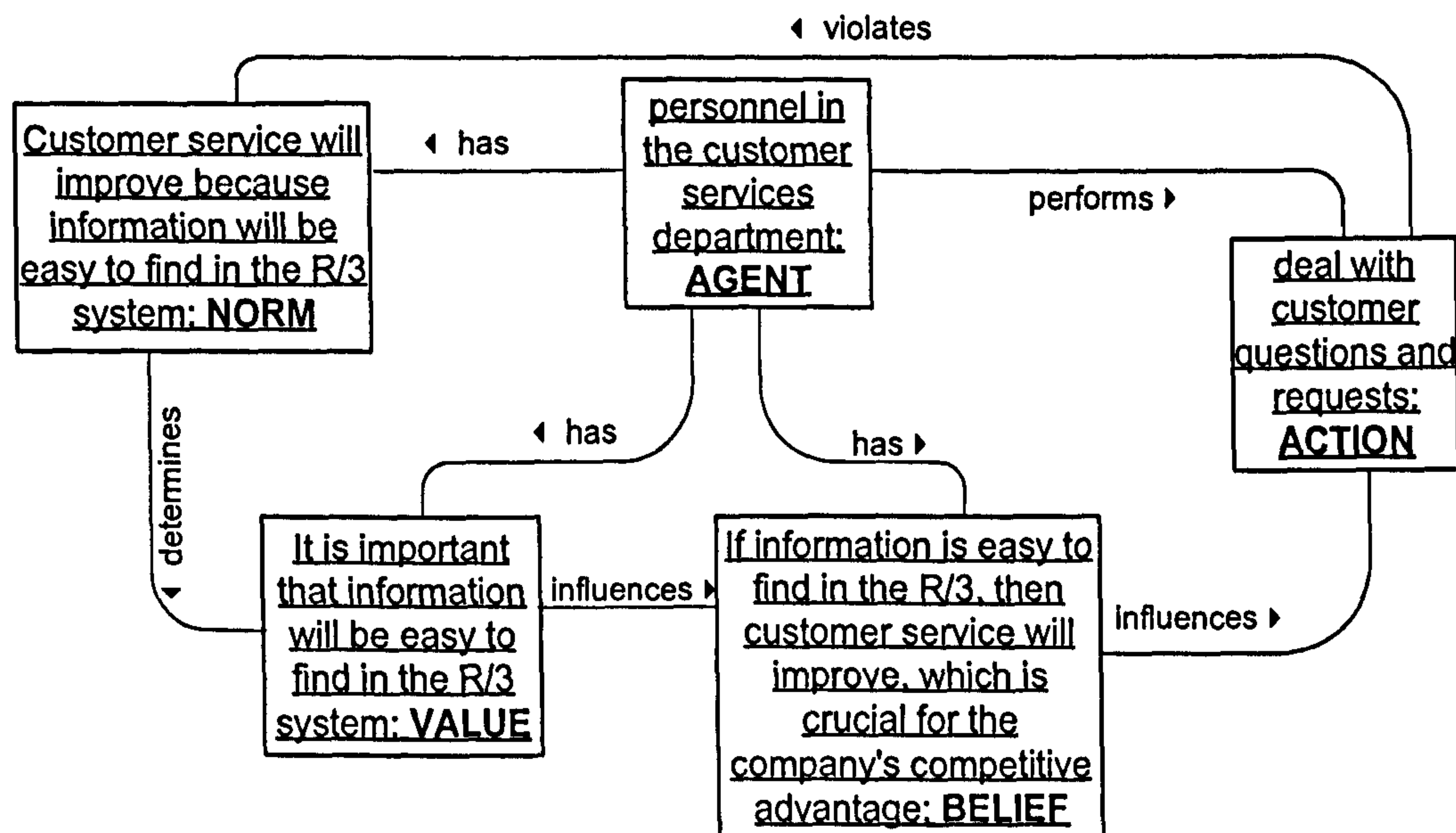


Fig. 5.7: An instantiation describing facets of culture relating to staff frustration arising from poor customer service provision with the new system

#### 5.4.3.2 The UK subsidiary and its problems

Four problems were identified at the UK subsidiary relating to procedures, failure to meet customer requirements, and lack of functionality. The interviewees offered numerous opinions about the reasons behind these problems (interview transcripts in appendix 5.12).

The first 2 problems relate with the implementation of the WM (warehouse) module.

##### 1. Lacking desired functionality

UK stakeholders identified problems with the initial warehousing system. From the transcripts, an often-repeated problem was that the initial version of the warehousing module

failed to meet the warehouse requirements. According to the warehouse manager, “the standard package did not do all the work we wanted it to, and particularly not in the warehouse”. The R/3 system did not do all that was required in the warehouse, and so a lot of configuration was done to the warehouse module. “Warehousing was very weak to start with and we did a lot of development there to make it better” (IT Development Manager). “One of the things about the implementation is that we have had to amend a significant amount of the SAP software, we made many, many changes to standard SAP to enable it to work with the warehouse” (warehouse manager). According to the interviewees, the success in the warehouse was critical to the success of the company. “For a distribution company like ours the warehouse is one of the most important factors of success. If something is wrong in the warehouse, then we cannot provide the service we want to the customers and if this happens then we lose customers. The warehouse has to be one of the most effective operations within a distribution company” (SD key user). According to the IT development manager, before the implementation of R/3 “employees thought that the warehouse operations will very effective because the new system will have all the desired functionality”. However, for all the aforementioned reasons, the failure of the SAP system to meet the requirements of the warehouse resulted in a lot of stress to many employees: “so all these problems with the warehousing system in the beginning caused a lot of stress across the whole company” (SD key user). Day-to-day activities performed by the warehouse employees violated their expectation and the problem that the system was lacking desired functionality arose.

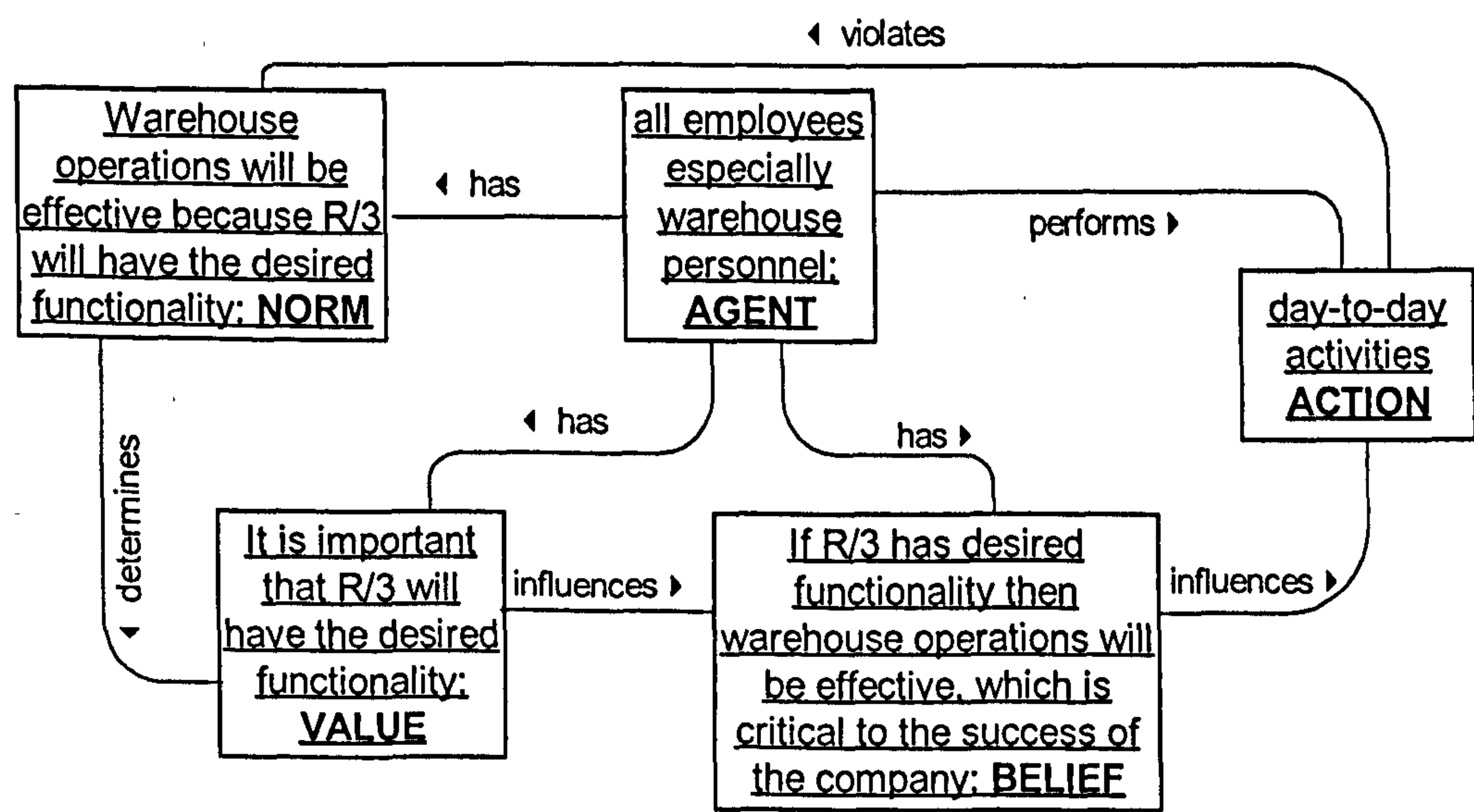


Fig. 5.8: An instantiation describing facets of culture relating to the lack of desired functionality of the warehousing system



Warehouse personnel expected that will be effective because the R/3 will have all the desired functionality. This is an expectation on the new system, and hence a norm. For the expectation to be met, 'it is important that R/3 has the desired functionality', which is the value. The belief explains why the agents have this expectation and it was found that the warehouse personnel believed that if R/3 has the desired functionality then the warehouse operations will be effective, which is critical to the success of the company'. The problem was modelled using the meta-schema presented in chapter 3.

## 2. Unsuitable operating assumption

Another significant problem with the UK warehouse identified by stakeholders was the operating assumptions for the SAP package. For example, the package's updates of purchase orders assumed perfect information and processes, even when this was not always the case. The SD key user claimed that: *"You can have a complex delivery schedule against the purchase order in theory and then the supplier may acknowledge different quantities and different dates, and it is not actually possible logically to match those perfectly but the package has made an attempt and it just falls down"*. He argued that such systems have to *"achieve the minimum safe, what can logically be done, and not to attempt to do it perfectly, because logically it cannot be done perfectly, there are too many variables"*. Instead, computerised systems must adapt to prevailing local circumstances. *"It wants to do everything perfectly and this is not possible"*. *R/3 cannot deal with complex delivery schedules, something which is important for a company like ours ... It is quite mad. The system thinks that everything is perfect. But nothing is that perfect in real life. Real life situations are too complex for a system like R/3"* (SD key user). According to this stakeholder, *"the fact that the system is so inflexible makes the process of making purchase orders inflexible and hence complicated, something which was not expected of the system at all, rather the opposite"* (SD Key user). When the employees created purchase orders with multiple delivery dates, their expectations got violated and the problem of unsuitable operating assumption arose.

Warehouse personnel expected that R/3 will process flexibly purchase orders because it is a flexible system. This is an expectation on the new system, and hence a norm. For the expectation to be met, 'it is important that the R/3 is flexible', which is the value. The belief explains why the agents have this expectation and it was found that the warehouse personnel believed that if R/3 is flexible then purchase order will be processed flexibly and so the company will be able to handle complex delivery schedules. The problem was modelled using the meta-schema presented in chapter 3.

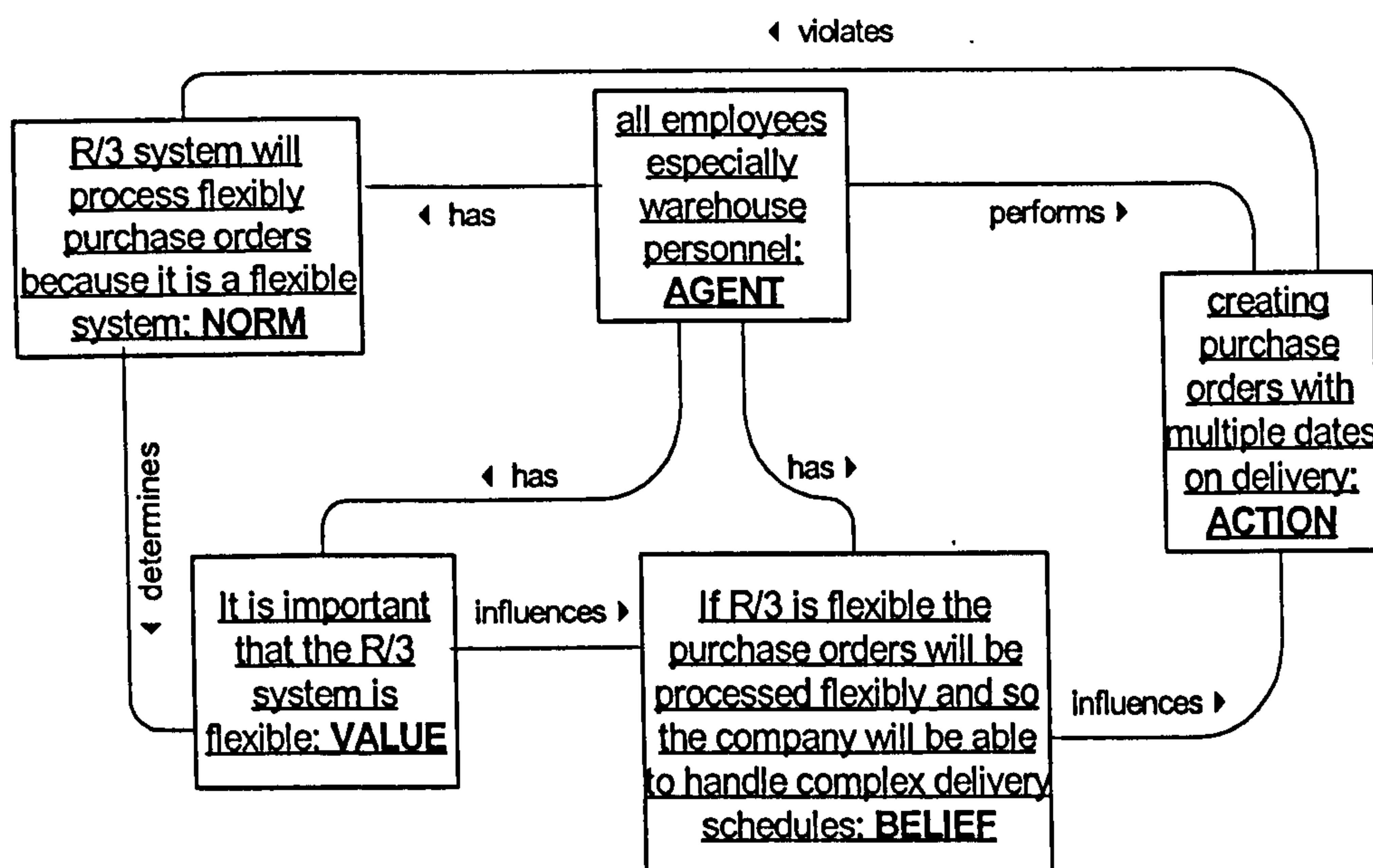


Fig. 5.9: An instantiation describing facets of culture relating to failure to handle complex delivery schedules

UK stakeholders also identified problems with sales and marketing functions. Interview transcripts with UK stakeholders were also analysed to produce model fragments that describe stakeholder norms, values and beliefs. The final 2 instantiations describe the culture-related problems with the SD (Sales & Distribution) modules.

### 3. Poor customer service

Sales office personnel stated that the original SD order entry screens did not support efficient telephone orders: *"Order entry in SAP is quite cumbersome because of the way it is set out, and because of the information that we have to enter, it can make life quite difficult"* (SD Key User). Sales staff believed that the standard R/3 solution was inefficient: *"I just think that the nature of how SAP is does not make order entry easy"* (SD Key User). One consequence of this slower order capture was a service dip: *"When SAP first went live we did not get the orders on the system as quick as we should, we did not finish the picking as quickly as we should"* (Warehouse Site Manager). Staff valued good service for the future success of the organisation, and believed that the inability to provide the service level required from the customers was unacceptable. *"We expected the new system to make order entries quicker and more efficient because it would be very functional. Especially for a distribution company, such a functionality is more than necessary ... We were losing customers because of all the*



delays associated with the cumbersome order entry” (SD key user).

Sales and marketing personnel expected that the sales order entry will be quick and efficient because R/3 will be very functional. This is an expectation on the new system, and hence a norm. For the expectation to be met, ‘it is important that R/3 is functional’, which is the value. The belief explains why the agents have this expectation and it was found that the sales and marketing employees believed that if R/3 is functional then sales order entry will be quick and efficient, which is crucial for the future success of the company.

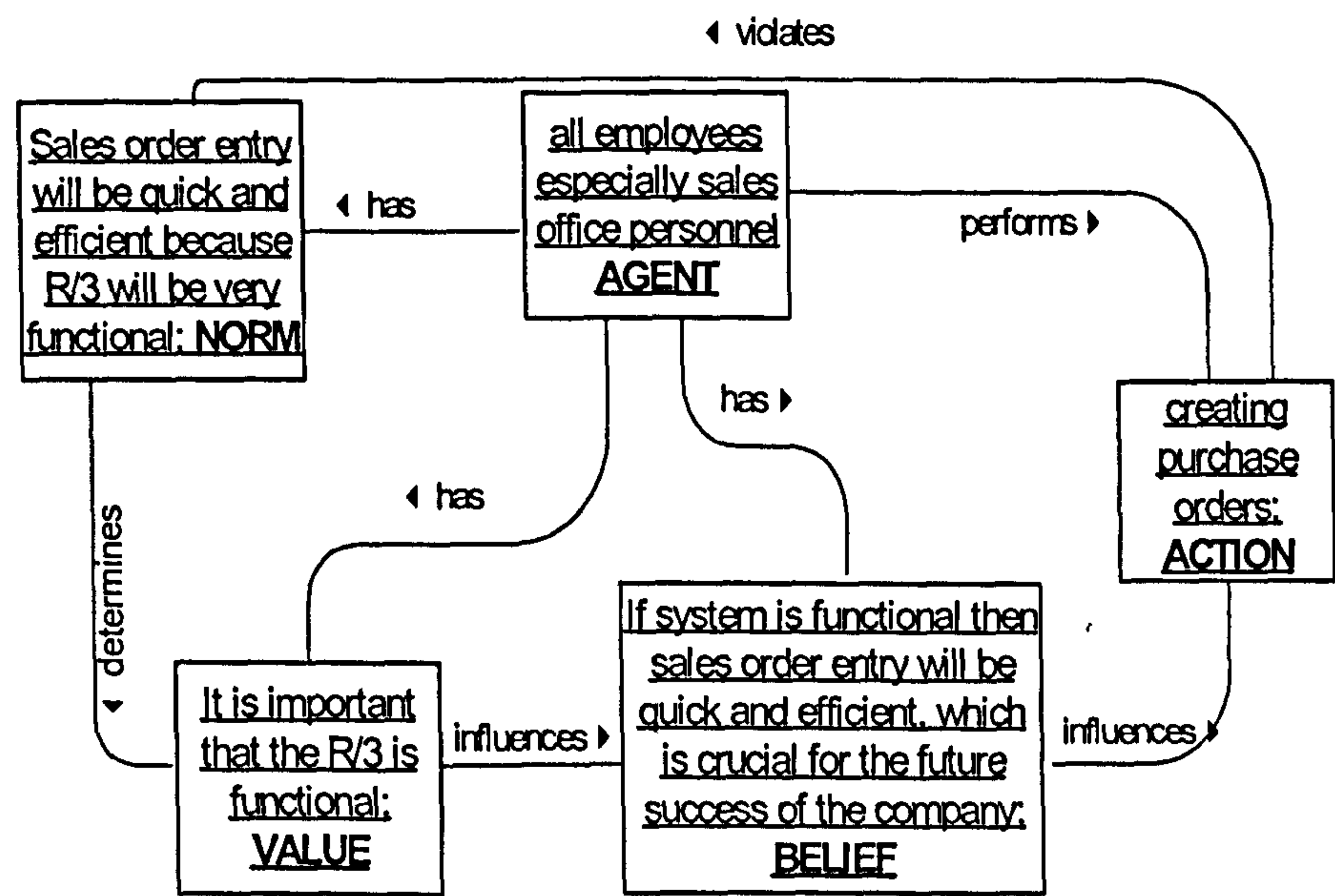


Fig. 5.10: An instantiation describing facets of culture relating to failure to provide adequate customer service after the implementation

#### 4. Hidden R/3 functionality

Another problem that was identified from the interview transcripts was related to R/3’s hidden functionality. The UK personnel who were encountering problems with the R/3 system, or could not find functions in R/3, would generate personal solutions using spreadsheets and other MS-Office documents without checking whether R/3 offered these solutions. According to the SD key user, “many employees used other functions like Excel to do their work. The R/3 might have all the functionality in the world but it is so hard to find that people get frustrated. I would have thought that a system like that would have all the desired functionality and it would be easy-to-find. But this is not the case. It is more of a hide and seek situation really”. The same situation prevailed in the warehouse; “in the beginning the situation was very different. Employees used other functions to do their work”. Employees

across the whole company were frustrated with this hidden functionality of R/3. They felt they had to use something else to help them complete their day-to-day work. “Many employees used and sometimes still use the old system or other functions to do their work. It was hard and time-consuming for them to find what they needed in order to complete their job in R/3” (IT development manager). Day-to-day interaction with the system violated their expectation and the problem of hidden functionality arose.

Sales and marketing personnel expected that the functionality will be easy to find because R/3 will provide all desired functionality. This is an expectation on the new system, and hence a norm. For the expectation to be met, ‘it is important that the R/3 provides all desired functionality, which is the value. The belief explains why the agents have this expectation and it was found that the sales and marketing employees believed that if R/3 has all desired functionality then it will be easy to find and so the employees will complete their job quickly. The problem was modelled using the meta-schema presented in chapter 3.

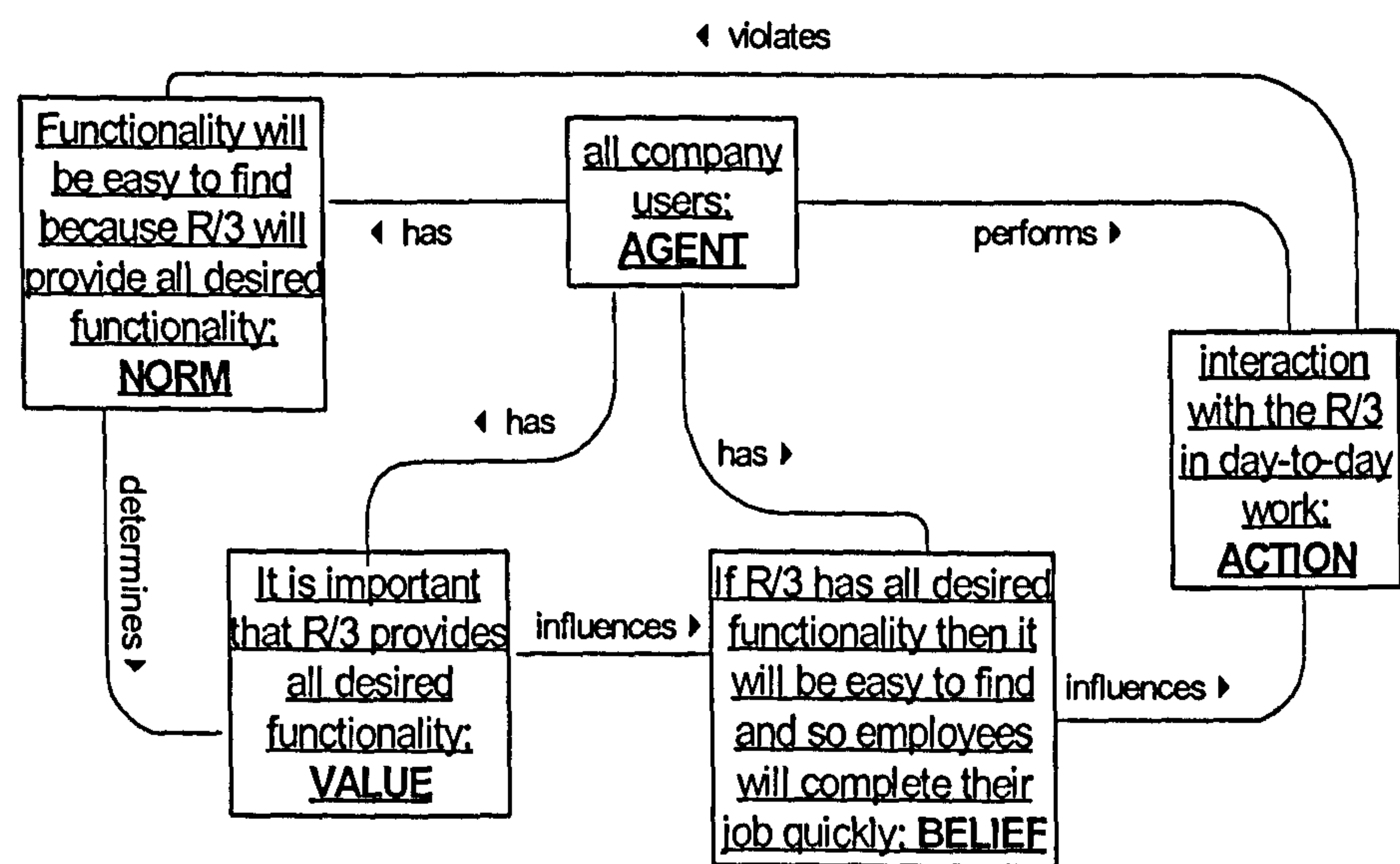


Fig. 5.11: An instantiation describing facets of culture relating to end-users using non-R/3 software to deliver functions and services because of the system’s hidden functionality

### 5.4.3.3 The German subsidiary and its problems

From the interview transcripts (appendix 5.13), it was elicited that the German subsidiary did not report any culture-related problems as a result of the SAP implementation. The interviewees offered numerous opinions that support this position.



According to the employees in the German subsidiary, the problems faced with the new system were not related to the actual system but with the change from the previous one. *"We had some problems and this led to employees experiencing job-related stress. These problems had to do with them getting used to the new system because the previous one was bespoke and SAP is windows based. So they just had to get used to it"* (IT development manager). The IT development manager added: *"There are no real problems with SAP. We only have some minor problems and this is because our business processes change overtime that change the nature of our business and which have to be configured into SAP. Basically, it is just normal that we couldn't foresee such changes then when we configured SAP, so while changes appear, we still have to deal with them"*. The SD key user agreed and offered her opinion: *"At the beginning it was a bit harder as it is a program that requires you to navigate through many screens...; they were not really what I would call problems, they didn't have such a tremendous effect. More like being more conscious about what I am doing when asking an order rather than doing it mechanically. So it might have just taken a bit longer to deal with each customer enquiry"*. The warehouse manager believed the same thing: *"Yes, there were a few problems but it was more to get used to working with a mouse. It didn't have much to do with the actual SAP system as such. I think this had to do also more with the fact that in order to understand and learn something you have to be out there and understand it"*.

The reason for the non-existence of culture-related problems within the German subsidiary can be attributed to the way of doing business before the SAP implementation was very similar to after the implementation. A quote from the IT development manager supports this argument: *"In order to avoid possible problems we changed our processes to the ones suggested by the SAP software. If you want to get the best out of the SAP software, you should adapt your processes to what the software suggests. So, I don't think that we had any problems when we implemented it. At least nothing significant. You do get the odd delays etc. But that is part of day-to-day work anyway"*. Another quote from the same employee strengthens this argument: *"Yes SAP fits perfectly. The other previous system we had was already very structured. So the change to SAP, which is also a very structured software, did not cause any problems, like changing the way from how work was done before to now. Now we are even more structured and more co-ordinated. So SAP fits perfectly the way the company works. We are more professional now. The whole company became more hierarchical and united. Before there used to be just small divisions, quite independent. The hierarchy is much better as work gets more regulated and everything is more structured. Independence didn't guarantee that the work was done better, now it is. It is much easier for me to be in a hierarchical company"*. In the sales department, the same things were resonated: *"I wouldn't say though that the way we used to work has changed in terms of any*



*change in the process, but just in terms of using a new system really. The way we used to work is the same, we only use a different and more efficient system” (SD key user).*

In addition, the attitude towards the new system by the employees was very positive, which can also explain the fact that no culture-related problems are reported. Their perception, even during the implementation when facing difficulties, was that it is a very good system. *“The main benefit you get from the SAP software is that you get a very mature standard software package and you don’t have to develop anything further. This is in my opinion the main advantage of SAP, and really the way things are working nowadays there is no way around it” (IT development manager).* The other employees shared his view: *“SAP is a very efficient, holistic and intelligent system” (SD key user), “I think it is the system of the future” (warehouse manager) and “The system is logical and clear and gives you confidence in what you do” (IT MM developer).*

## **5.5 Discussion of the results**

The studies at the 3 subsidiaries of the pharmaceutical organisation were conducted to investigate hypotheses H1, H2, H3 and H4.

### **5.5.1 Summary of the results**

Twenty-two problems in total were elicited at the 3 subsidiaries, of which eleven could be attributed to national and organisational culture.

In the Scandinavian subsidiary, eight problems were identified, seven of which were culture-related. In the UK subsidiary, eleven problems were identified, four of which were found to be culture-related. In the German subsidiary, three problems were identified, none of which were culture-related.

In all eleven instantiations describing the culture-related problems of the Scandinavian and the UK subsidiaries, the importance of the agents’ norms, values and beliefs on performing an action, was identified. The critical element of each instantiation was the agent’s expectation expressed as a norm, which in turn reflected the agent’s values and beliefs. Each instantiation illustrated how the element ‘action’ changed because of the implementation of the new system. This ‘changed’ action violated the critical element ‘norm’ and gave rise to the



culture-related problem illustrated by the instantiation. Each of the eleven culture-related problems was found to be important for the efficiency of the SAP implementation, because it either affected the agents' behaviour with the system or the subsidiary's as a whole. Based on these results I review hypotheses H1, H2, H3 and H4 in turn.

### **5.5.2 Hypothesis one (H1)**

The studies discussed in this chapter aimed to test hypothesis one (H1), which is:

**H1 Organisations and national cultures have a critical impact on the efficiency of ERP implementations**

As discussed in chapter 1, I define impact in the specific context, as the effect or impetus that an element of culture might have on the efficiency of ERP implementation, which could give rise to culture-related problems. These culture-related problems are more than, or as critical for the efficiency of ERP implementations, as other types of problems customer organisations face.

The sub-objectives that enabled me to test this first hypothesis were:

1. To conduct empirical studies that will elicit problems that customer organisations encounter when implementing an ERP package.
2. To investigate whether some of those problems occur as a result of the national and organisational culture of the customer organisations.
3. To examine whether these culture-related problems are as critical as other types of ERP implementation problems.

All sub-objectives were met; the studies that were conducted at the 3 subsidiaries elicited a number of problem associated with the SAP implementations. Eleven of those problems occurred because of the national and organisational culture of 2 of the subsidiaries. All culture-related problems were found to be as critical as the other types of ERP implementation problems the subsidiaries faced. It can be said that each of the eleven culture-related problems are as important as the other types of problems faced, because it affected the agents' performance on the R/3 and the subsidiary as a whole.

Therefore, it can be argued that the results from the studies provide evidence to support hypothesis one (H1).

### **5.5.3 Hypothesis two (H2)**

The studies discussed in this chapter also aimed to test hypothesis two (H2), which is:

**H2** Social and management science theories and models can be integrated and progressed to develop a descriptive model (meta-schema) of some of the key elements of national and organisational culture that are critical to ERP implementations

The sub-objectives that enabled me to test this hypothesis was:

1. To develop models (instantiations) of the descriptive model (meta-schema).
2. To investigate whether these models (instantiations) have descriptive properties of some of the key elements of culture, critical to ERP implementations.

The results from the studies at the 3 subsidiaries demonstrate that the objective was met. Eleven instantiations (figure 5.1-5.11) were developed, which demonstrated the impact national and organisational culture had on the efficiency of the SAP implementations of the subsidiaries. More specifically, each of the instantiations described accurately how an agent, by performing a certain action, got her/his norm violated because of the implementation of the SAP system. The instantiations were able to describe the criticality of the element 'norm' for SAP implementations.

Therefore, it can be safely assumed that the results from the studies provide evidence to support hypothesis two (H2).

### **5.5.4 Hypothesis three (H3)**

The studies discussed in this chapter also aimed to test hypothesis three (H3), which is:

**H3** Social and management science theories can be extended to produce models that accurately describe the culture-related problems observed in current ERP implementations



The sub-objectives that enabled me to test this hypothesis were:

1. To develop models (instantiations) of the descriptive model (meta-schema) for the observed culture-related problems, based on the interview data.
2. To investigate whether these models (instantiations) can accurately represent the culture-related problems observed.

All sub-objectives were met; instantiations were produced that accurately describe the eleven culture-related problems identified at the subsidiaries. Each of the eleven instantiations offered a representation of the eleven culture-related problems, by showing the elements of culture associated to each to each of the problems as well as the critical element 'norm', whose violation gave rise to the problems. Each one of the elements was described by accurately labelling it using the quotes from the interviewees' responses.

Hence, it can be claimed that support has been found to accept hypothesis three (H3).

#### **5.5.5 Hypothesis four (H4)**

Finally, the aim of these studies was to test hypothesis four (H4), which is:

**H4** Social and management science theories of culture can be extended to produce models that can be applied to explain the reasons behind the culture-related problems arising from ERP implementations

The sub-objectives that were set in order to help me investigate this hypothesis are:

1. To develop models (instantiations) of the descriptive model (meta-schema) for the observed culture-related problems, based on the interview data.
2. To investigate whether these models (instantiations) can offer the reasons for the existence of those culture-related problems.

The eleven instantiations of the culture-related problems offer potential explanations of the problems. Each of the instantiations illustrates how the element 'action' changed because of the implementation of the new system. This 'changed' action violated the critical element 'norm' and gave rise to the culture-related problem illustrated by the instantiation. This

violation of the agents' norms is the reason behind the existence of the culture related problems.

Therefore, the data provides evidence for hypothesis four (H4)

## **5.6 Chapter Summary**

In this chapter I discussed the studies carried out for evaluating the theory of culture for ERP implementations presented in chapter 3. The study took place at 3 companies, which are all subsidiaries of a large multinational pharmaceutical organisation. All 3 subsidiaries had implemented SAP R/3. I conducted interviews with various employees at each subsidiary following my data gathering and analysis method. This method consisted of 3 questionnaires; basic questions, SAP implementation questions and culture-related questionnaire. The data from the interviews were analysed and eleven culture-related problems were identified. Seven of which occurred in the Scandinavian subsidiary and four in the UK. No culture-related problems were identified in the German subsidiary. This lack of culture-related problems can be attributed to two possible reasons, both of which relate to the subsidiary's culture. More specifically, it can be argued that no problems were identified because the culture of the German subsidiary is very concerned with its external political view. This implies that the subsidiary has a very 'closed' culture and therefore did not reveal any negative aspects on its SAP implementation to outsiders. Another explanation is that no culture-related problems were identified because of the actual culture of the German subsidiary. It can be inferred that the way things were done in the subsidiary were very similar to the way the R/3 does things. Therefore, the implementation of R/3 did not bring any substantial changes to the German subsidiary, which is also what the interviewees there felt. Finally, based on these results, each of the 4 hypotheses that were set to be explored at the beginning of this chapter, were reviewed.

The next chapter introduces the method for implementing ERP systems in different national and organisational cultures.



## Chapter 6

### **CAREs: Culturally Aware Realisation of ERP systems**

This chapter presents the CAREs method for implementing ERP systems in different national and organisational cultures

## Chapter 6

### CAREs: Culturally Aware Realisation of ERP systems

#### 6.1 Introduction

A central contribution of this thesis is the method for implementing ERP systems in different national and organisational cultures. The method is called CAREs (Culturally Aware Realisation of ERP systems). CAREs provides the theoretical background for hypothesis five (H5), which is tested in the next chapter.

**H5** The CAREs method can provide some utility in ERP implementations to identify, explain and predict culture-related implementation problems.

I define utility as the usefulness that the 3 components of the CAREs method can provide to ERP implementation teams in identifying, explaining and predicting culture-related implementation problems.

The first objective of this chapter is to provide an overview of the CAREs method, derived from the theory introduced in chapter 3 and the empirical findings presented in chapter 4 and 5. The second objective is to describe the 3 components of the CAREs method and to provide detailed examples.

#### 6.2 Overview of CAREs

CAREs is a theoretically-grounded method that supports an implementation team to identify and predict possible culture-related problems in ERP implementations. It comprises of 3 components. Firstly, it consists of a technique for eliciting evidence of the national and organisational culture of a company as well as information about the ERP implementation that will take place. Secondly, it offers an approach for modelling and analysing the elements of that company's culture and its expectations of the new system. Thirdly, CAREs presents a technique for identifying a set of generic cultural predictions for each national culture that serves as a checklist of culture-related issues that could arise during ERP implementations.



### 6.3 Rationale and origin of CAREs

The aim of the method is to inform an ERP implementation team about the culture-related problems that may arise from that implementation. Figure 6.1 outlines the CAREs method. At the early stages of a project, the implementation team models both the current and new business processes and software solution. The CAREs method assumes that every change in the business processes will manifest itself through ‘changed’ actions. So, for every change in the business processes, the implementation team produces instantiations of the meta-schema of culture (presented in chapter 3) for specific ‘changed’ actions in order to identify potential culture-related problems. Moreover, the team uses the cultural predictions to understand the level of impact that such a change in the business process might have. I hypothesise that the instantiations of the meta-schema, together with the generic cultural predictions can provide useful advice for handling culture.

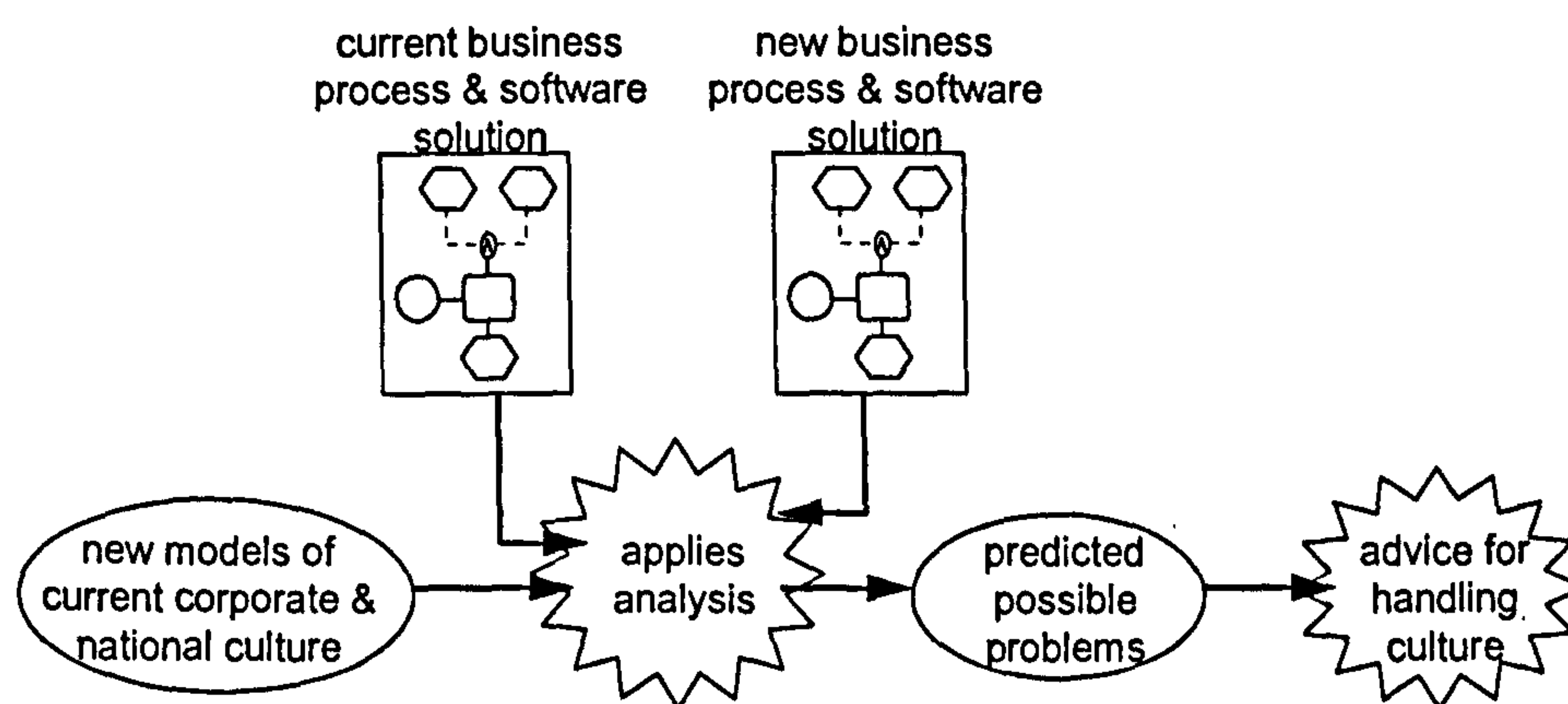


Fig 6.1: An outline of CAREs: the extended ERP implementation method for culture-sensitive implementations.

CAREs is developed from the following sources:

1. The theory of culture for ERP implementations presented in chapter 3.
2. The method and tools of the key scholars (Hofstede 1994, Trompenaars 1994) in the area of culture for eliciting evidence about organisational and national cultures.
3. The data gathering and analysis method used for the studies reported in chapter 4 and 5, improved using the results from these studies.



CAREs is comprised of 3 components, which have to be followed in turn for the method to be functional. These 3 components are:

- 1) The culture elicitation technique
- 2) The modelling technique
- 3) The cultural predictions.

Each of the 3 components consists of a number of stages. Figure 6.2 illustrates the structure and relationships between the components and their respective stages in CAREs.

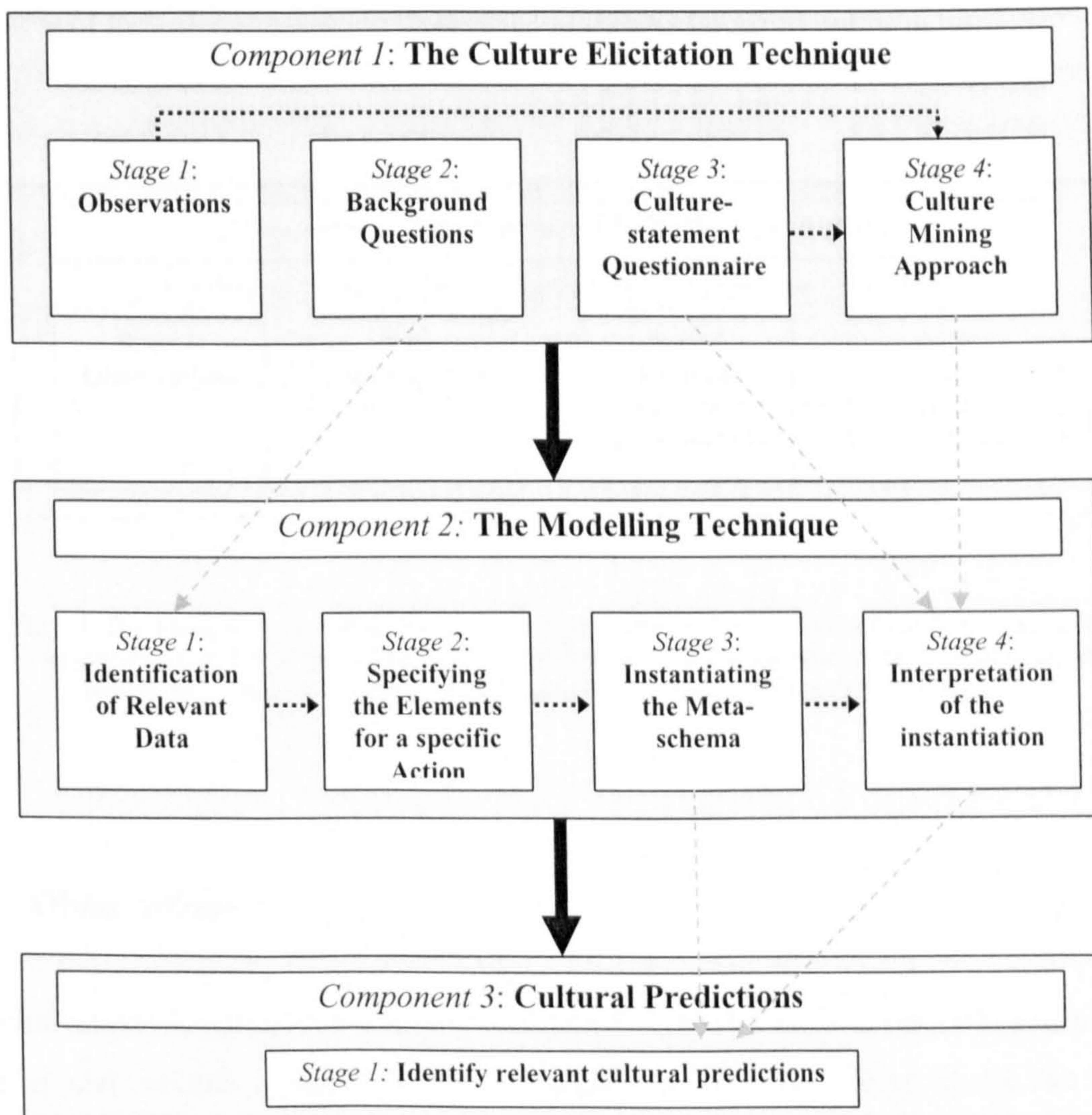


Fig. 6.2: The 3 components of the CAREs method and their different stages. There are 3 types of arrows in the figure, which indicate 'contributes to'. These 3 types are:

- The black arrows, which indicate how one component contributes to its successor ( → )
- The dotted black arrows, which demonstrate how one stage contributes to another stage, within the same component ( ···→ )
- The grey dotted arrows, which indicate how the stage of one component contributes to a stage of the succeeding component ( ---→ )



In the following section, I describe each of the three components and explain them using examples from the results of the empirical studies presented in chapter five.

## 6.4 Culture elicitation technique

The ‘culture elicitation technique’ part of CAREs consists of 4 stages. The 1<sup>st</sup> of its 2 aims is to gather as much information as possible about the culture (national and organisational) of the organisation that implements an ERP package. Secondly, it aims to collect information about the ERP implementation and the prevailing atmosphere as a result. Figure 6.3 illustrates the 4 stages of the culture elicitation technique, which are described below in turn.

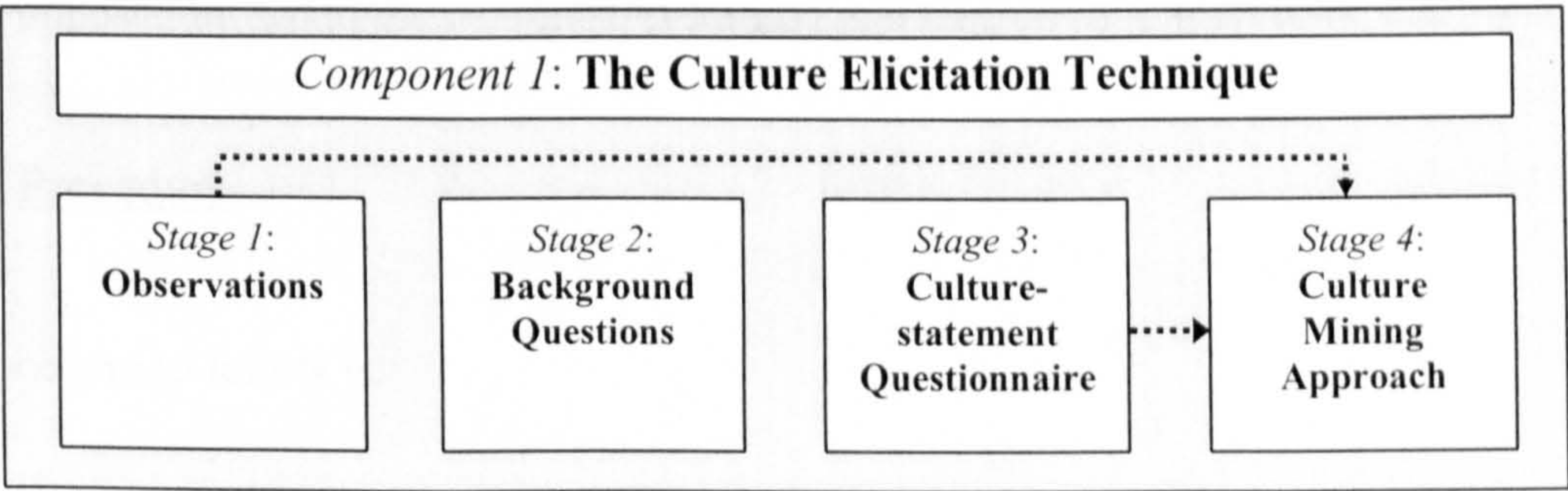


Fig 6.3: The 4 stages of the culture elicitation technique and their relationships (which is depicted with an arrow). Stage 2 is not associated with any of the stages of the elicitation technique, although it contributes directly to a stage of the 2<sup>nd</sup> component of the CAREs method (see figure 6.1)

### 6.4.1 Observations

The observation technique is a qualitative approach that involves the researcher inspecting, analysing and recording events of interest (Blaxter et al. 1996). Observations can enable someone to capture the explicit elements of a culture (represented in the outer layers of the generic model of culture discussed in chapter 3, like symbols and style, etc) that can provide evidence about the deeper, implicit elements of a culture (represented in the core of the generic model of culture), such as values and beliefs.



#### 6.4.1.1 Purpose

The purpose of this stage is to examine, analyse and document interesting characteristics of culture to reveal evidence about the client's implicit culture - the norms, values and beliefs. Observations can be used at any point during the culture elicitation part of the method, but have to be completed before moving on to the final stage of the culture elicitation part of the method.

#### 6.4.1.2 Outcome

The outcome of this stage is a list of observations about the culture of the company implementing an ERP solution. The observations technique is a simple way of eliciting information about the organisational and national culture of a company without limitations that are imposed by arranging meetings, recording and transcribing interviews, etc.

#### 6.4.1.3 Procedure

The procedure to follow is:

1. Physical setting: Observe the physical setting; location, character and size of the building, offices layout, dress code, level of luxury, furniture, logo, extra facilities, decorations, etc; The physical setting might be irrelevant to the conduct of business but it reveals a lot about a culture (Deal & Kennedy 1982). A company that is proud of itself and its culture will reflect this pride through its environment, and Deal & Kennedy suggest that the physical setting expresses what the company wants to stand for to the outside world.
2. Statements: Read what the company/country says about its culture; what a culture states about itself, for example mission statements, website, annual reports, press releases, brochures, books and articles. Some cultures recognise the importance of their values and their people, and want the world to know this. Other cultures focus on the business and its performance without much mention of the human efforts (Deal & Kennedy 1982). These statements serve to increase the understanding of a culture.
3. Manner: Observe how the company greets strangers, the way employees interact with each other, with their manager, the way they spend their time, e.g. in coffee areas, lunchtime, meetings, social events and groups working together. These manners are all



indicators of a culture. For example, in a service-conscious company, guests might be offered coffee when entering, and in bureaucratic environment each guest might have to go through a sign-in procedure before entering. In general, observations of the manners within a culture can increase our awareness of this culture.

4. Draft a list with all the observable characteristics of culture elicited in the previous 3 steps.

#### 6.4.1.4 Example

Let me introduce an example of a hypothetical company called Success Plc. In this instance, Success Plc had decided to employ the services of a consulting company to provide support during the implementation of an ERP system within the sales department. Imagine a hypothetical person named Hope, who is one of the consultants supporting this implementation. Here, I provide an example of the observations that Hope made from following the aforementioned procedure. The following are simple observations about Success Plc, some of which are taken from the studies presented in chapter 5.

##### Step 1: Physical setting

- new office building shared with 3 more companies
- building located in industrial area
- modest manifestation of logos
- informal dressing
- simple offices with no extra luxuries

##### Step 2: Statements

- equal opportunities
- open, friendly environment
- encourage personal development of the employees
- generous bonus system

##### Step 3: Manner

- very quick lunch
- formal interactions, mainly between employees of department
- behaviour towards strangers is friendly but formal
- some social events organised by the company (e.g. Christmas parties)

- employees from across the company with an interest in art organised their own activities (visiting exhibitions)

The aforementioned list of observations, made by Hope, reveals useful information about the explicit elements of the culture of Success Plc, such as rituals, symbols etc. In the following stages of the elicitation technique, Hope aims to elicit evidence of more implicit elements.

#### **6.4.2 Background questions**

This stage of the technique involves conducting interviews with the employees of the company that implements the ERP system. According to Deal & Kennedy (1982), any information that derives from an interview can help increase a researcher's understanding about a culture. A key requirement at this stage is interviewee selection. The choice of the participants is of crucial importance as it determines the nature of the data that will be gathered. Two factors have to be taken into consideration. The first is the number of the employees that will be interviewed, which should be in proportion to the total number of employees working for the client organisation. The second factor is the job roles and positions of the interviewees, which should represent the whole organisation and should be from different levels in the hierarchy.

##### **6.4.2.1 Purpose**

The purpose of this stage is to establish a preliminary connection with the chosen employees and to gather information from them. This is an important stage as it aids the understanding of each interviewee's job role and responsibilities within the company. The second purpose of this stage is to elicit from each interviewee, information about the ERP implementation and the atmosphere prevailing in the company. The background questions can be used at any point during the culture elicitation part of the method, but have to be completed before moving on to the final stage. All interviews must be recorded for further analysis purposes.

The background questions originated mainly from two sources. The first source was the different case studies and articles of SAP implementations, which contained the most common issues arising as a result of such an implementation. The second source was the meta-schema of culture presented in chapter 3. The meta-schema included key elements of ERP/IS implementations, for example goals, objects, actions etc. the aim of each question was to extract information about at least one of the elements of ERP/IS implementations.



#### 6.4.2.2 Outcome

The outcome of this stage is a corpus of data that enables a thorough understanding of the views of the employees about the ERP implementation and their evidence about the prevailing climate and about the culture of the company.

#### 6.4.2.3 Procedure

The procedure to follow is:

1. Set up a meeting with each interviewee individually;
2. Start meeting with an informal discussion by using the introductory questions below (please note words in *italics* are keywords to help when asking the questions):
  - a. How long have you been working here?
  - b. What is the nature of your job? (*Job title, roles, etc.*)
  - c. Can you please give me a short story of your background? (*studies, other/previous positions, etc.*)
  - d. What are your ultimate goals for the future?
  - e. Can you please give me a description of a usual day at work (*including lunch, coffee breaks, etc*)
  - f. Would you characterise it as a routine?
3. Continue the interview by asking the principal questions. A sample of these questions is provided below, the complete list of questions in appendix 6.1.
  - a. How was the ERP implementation decided? (*communicated throughout the company and mutually decided, or announced?*)
  - b. Why do you think the company is implementing a new system?
  - c. What are the benefits and drawbacks of the current/old system?
  - d. Are you aware of the benefits and drawbacks of the new system? (*if yes, were these presented to you or did you find out by yourself?*)
  - e. From what you know do you think the system fits with the needs of your company?

#### 6.4.2.4 Example

Hope considered the factors for interview selection, and decided on interviewing 3 employees from Success Plc. (the hypothetical employees are called, Xenia, Aany and Tanya). Here, I provide an example of some of the answers to the background questions Tanya gave to Hope when she followed the aforementioned procedure. The answers are taken from the studies reported in chapter 5.

##### Introductory questions

- a. How long have you been working here?  
*"For the past 6 years"*
- b. What is the nature of your job?  
*"I take sales orders from the customers or deal with their enquiries. All this is done mainly by phone"*
- c. Can you please give me a description of a usual day at work?  
*"I arrive at 7-7:30, turn the PC and phone on and I start dealing with the customers orders, deliveries by phone, fax etc. I work until 16:00, but if there is more work, I stay longer. You either get paid double pay, or you can take it as days off".*

##### Main questions

- a. How was the ERP implementation decided?  
*"It was just decided because the company got larger and we couldn't develop more the previous system. Another factor was that the headquarters wanted to implement the same system across all the offices and subsidiaries and SAP R/3 was selected as being the best one. The decision was announced to us without us contributing at all to the selection of the new system".*
- b. How do you think your roles and responsibilities will change as a result of the ERP implementation? For example? Why?  
*"I am employed now as a hotline sales person. My roles are very much restricted. I hope now my job will expand and I will be able to have more responsibilities and interesting things to do. I think they will expand because I have been working here for quite some time and I have shown that I can do things well. Good work is appreciated".*
- c. What do you think are the essential benefits that will arise as a result of the ERP implementation? Why, do you think?  
*"I think it will make sales order entries much quicker, not just because the*



*whole system will be faster but also because the new system is, according to what I have been told, the latest technology. So it is bound to be better than what we had. So, if it is quicker, we will be able to take more orders, which will increase the company's competitive advantage. This is crucial for a company".*

Hope succeeded in establishing a preliminary connection with the 3 employees and eliciting information about the ERP implementation and the atmosphere prevailing in Success Plc as a result of this implementation. The next step for her is to send the culture-statement questionnaire to elicit evidence of its culture.

### **6.4.3 Culture statement questionnaire**

The culture-statement questionnaire consists of a set of 30 statements that employees have to rank from a scale of A to G (A: strongly agree to G: strongly disagree). The 30 statements underpin valuable information about the culture of the company that implements the ERP system.

The set of statements included in this questionnaire is synthesised from the existing culture questionnaires reported in the literature and the meta-schema of culture, which was presented in chapter 3. Scholars in the area of culture (Hofstede 1994, Generative Leadership Group 1997, Trompenaars 1994) have their own questionnaires for eliciting culture. Whilst constructing my questionnaire for this study, I examined these existing questionnaires. This enabled me to decide on the layout of the questionnaire, and the formulation of the questions.

#### **6.4.3.1 Purpose**

The purpose of the questionnaire is to gather evidence about the culture of the company that will implement an ERP system. Each of the 30 statements of the questionnaire veils evidence about the norms, beliefs and values that determine peoples' behaviours. The aim is to identify the percentage of employees that agree or disagree with each statement. The highest percentage for each statement indicates what the majority of the employees believe about each particular statement. The culture-statement questionnaire can be used at any point during elicitation, but has to be completed before moving on to the final stage of the culture elicitation part of the method.

6.4.3.2 Outcome

The outcome is a textual description of the dispersion of the results, for each of the 30 statements. The range of responses to each of the statements provide information about the culture of the company that is about to implement the ERP. By calculating the frequencies and percentages of the responses of the employees to each of those statements a representative view on the culture, in relation to that statement is provided.

6.4.3.3 Procedure

The procedure to follow is:

1. Prepare the list of the employees that the questionnaire will be sent to. This list should include the employees interviewed in the previous stage. If possible, include other employees from across the company to answer it as well.
2. Send the questionnaires and inform employees about the date that they have to be returned by. Assure confidentiality of responses. The questionnaires can be sent by email, internal post, etc. A sample of the questionnaire is provided in table 6.1, the full questionnaire can be found in appendix 6.2;

1	The management is more concerned with employees getting the work done, other than with the employees as persons.	A	<input type="checkbox"/>	B	<input type="checkbox"/>	C	<input type="checkbox"/>	D	<input type="checkbox"/>	E	<input type="checkbox"/>	F	<input type="checkbox"/>	G	<input type="checkbox"/>
2	Good results are rewarded.	A	<input type="checkbox"/>	B	<input type="checkbox"/>	C	<input type="checkbox"/>	D	<input type="checkbox"/>	E	<input type="checkbox"/>	F	<input type="checkbox"/>	G	<input type="checkbox"/>
3	Deadlines are loose and flexible.	A	<input type="checkbox"/>	B	<input type="checkbox"/>	C	<input type="checkbox"/>	D	<input type="checkbox"/>	E	<input type="checkbox"/>	F	<input type="checkbox"/>	G	<input type="checkbox"/>
4	There are numerous training and career development programmes within my company.	A	<input type="checkbox"/>	B	<input type="checkbox"/>	C	<input type="checkbox"/>	D	<input type="checkbox"/>	E	<input type="checkbox"/>	F	<input type="checkbox"/>	G	<input type="checkbox"/>
5	There are detailed regulation, rules and procedures for most of the things that I do.	A	<input type="checkbox"/>	B	<input type="checkbox"/>	C	<input type="checkbox"/>	D	<input type="checkbox"/>	E	<input type="checkbox"/>	F	<input type="checkbox"/>	G	<input type="checkbox"/>

Table 6.1: A sample of the culture-statement questionnaire. Each of the statements has to be ranked from a scale of A to G (A: Strongly agree, B: Agree, C: Tend to agree, D: Neutral, E: Tend to disagree, F: Disagree, G: Strongly disagree)



3. Gather the questionnaires by the deadline;
4. Analyse the returned questionnaires of the employees, in 5 steps:
  - a. For each statement, calculate using all returned questionnaires the total number of responses (frequency) for each point on the scale (A to G). The outcome will show the dispersion of the opinions of the employees for each statement;
  - b. For each statement, calculate from the frequencies, the percentage of responses for each point on the scale (A to G). The outcome will demonstrate the percentage of employees' responses for each point on the scale.
  - c. – This step is optional - For each statement, calculate the total percentage of responses for the points in scale A, B and C, which signify agreement. For D, which signifies neutrality and E, F and G, which signify disagreement. This step is useful if a quick analysis is needed.
  - d. Interpret the results by formulating a textual description for each statement based on the percentages of the employees' responses (If an in-depth analysis is needed use the percentages from step b. If a quick analysis is needed, use the percentages from step c). For example, if 7 out of the 10 employees (70%) disagree with statement 2 (good results are rewarded) and 3 out of those 10 employees (30%) agree, then one can argue that the majority of the employees believe that good results are not being rewarded. If the results are dispersed equally at both sides of the spectrum (A to G), then treat them in the same way as any other results. For example 5 out of 10 employees disagree with statement 2 and the other 5 agree, which means that the employees' opinions about statement 2 are equally dispersed.
  - e. Repeat steps a-d above for each of the 30 statements.

#### 6.4.3.4 Example

Hope sent the questionnaires to a number of employees of Success Plc. This section provides an example of the responses of employees Xenia, Aany and Tanya to some of the statements in the culture-statement questionnaire and the analysis of the resulting data.

The responses of the 3 employees to statements 2 and 3 are shown in tables 6.2, 6.3 and 6.4:

2 Good results are rewarded.  
A☐ B☒ C☐ D☐ E☐ F☐ G☐

3 Deadlines are loose and flexible.  
A☐ B☐ C☐ D☐ E☐ F☒ G☐

Table 6.2: The responses of employee Xenia to statements 2 and 3

2 Good results are rewarded.  
A☐ B☐ C☒ D☐ E☐ F☐ G☐

3 Deadlines are loose and flexible.  
A☐ B☐ C☐ D☐ E☐ F☐ G☒

Table 6.3: The responses of employee Aany to statements 2 and 3

2 Good results are rewarded.  
A☐ B☒ C☐ D☐ E☐ F☐ G☐

3 Deadlines are loose and flexible.  
A☐ B☐ C☐ D☐ E☐ F☐ G☒

Table 6.4: The responses of employee Tanya to statements 2 and 3

For each of the statements, Hope sorted all the responses and calculated their frequency. Then, she calculated the percentages of the 3 employees’ responses for each point on the scale (A to G). Table 6.5 shows the result of this analysis for statement 2 and table 6.6 for statement 3:

Statement 2: Good results are rewarded							
Response Employee	A: strongly agree	B: agree	C: tend to agree	D: neutral	E: tend to disagree	F: disagree	G: strongly disagree
X	0	1	0	0	0	0	0
Y	0	0	1	0	0	0	0
Z	0	1	0	0	0	0	0
Frequency	0	2	1	0	0	0	0
Percentage	0	67%	33%	0	0	0	0

Table 6.5: The frequency and percentages of responses for statement 2



Statement 3: Deadlines are loose and flexible							
Response Employee	A: strongly agree	B: agree	C: tend to agree	D: neutral	E: tend to disagree	F: disagree	G: strongly disagree
X	0	0	0	0	0	1	0
Y	0	0	0	0	0	0	1
Z	0	0	0	0	0	0	1
Frequency	0	0	0	0	0	1	2
Percentage	0	0	0	0	0	33%	67%

Table 6.6: The frequency and percentages of responses for statement 3

Hope then undertook on an in-depth analysis of the results. She interpreted the results by formulating textual descriptions for statements 2 and 3. For statement 2, she found that “67% of the employees of Success Plc agree and 33% tend to agree with statement 2. Hence, the majority of the employees believe that good results do get rewarded”. For statement 3, she found that “67% of the employees of Success plc strongly disagree and 33% disagree with statement 3. Hence, the majority of the employees strongly believe that deadlines are not loose and flexible”. The next stage of the CAREs method involved Hope finding out the explanation behind the aforementioned results.

#### 6.4.4 Culture mining approach

The aim of this stage is to elicit the possible explanations behind the observations made at the first stage and the justification behind each of the employees’ responses to the culture-statement questionnaire.

##### 6.4.4.1 Purpose

The purpose of this stage is to identify the rationale behind the evidence of culture as elicited from the observations made and through the responses to the 30 statements of the culture-statement questionnaire. This stage can only begin after the observations have been completed and the culture-statement questionnaires have been returned and analysed.

#### 6.4.4.2 Outcome

The outcome of this stage is a corpus of data that includes the explanations behind the employees' responses to the culture-statement questionnaire. The explanations can be useful when describing the culture of a company that implements an ERP system. They can also be useful when explaining the reactions of the employees to culture-related ERP implementation problems. The usefulness of the explanations is discussed further when describing the 2<sup>nd</sup> component (modelling technique) of the CAREs method.

#### 6.4.4.3 Procedure

The procedure is:

1. Arrange a meeting individually with each of the employees interviewed in stage 2 of the elicitation technique (background questionnaire);
2. From the observations made at the first stage of the elicitation technique, identify the ones that you want to be clarified and explained. For each of the 'fuzzy' observations, ask each interviewee to clarify it. This can be achieved in 3 steps:
  - a. take each observation and formulate a question asking for a "*why*". For example for the observation '*open, friendly environment*' formulate a questions in the form of "*do you think the environment here is open and friendly? If so, why?*"
  - b. ask the interviewee to provide an example(s) with her/his answer.
  - c. repeat steps a. and b. as necessary
3. Add the explanation elicited behind each 'fuzzy' observation. The outcome of this step is a clarification of the unclear observation made in the first stage of the elicitation technique.
4. For each of the 30 statements from the culture-statement questionnaire, ask each interviewee the rationale behind her/his response. This can be achieved in 3 steps:
  - a. re-formulate each statement into a question starting with "*why*". For example, for statement 2 (good results are rewarded) reformulate in the form of "*why do you think good results are rewarded?*"
  - b. ask the interviewee to provide an example(s) with her/his answer.



c. repeat steps a. and b. for each of the 30 statements.

5. Add the rationale elicited for each statement to the textual descriptions of the results from the previous stage”. The outcome of this stage is the explanation behind the results of the previous stage (culture-statement questionnaire).

#### 6.4.4.4 Example

Hope arranged a meeting with each of the 3 employees (Xenia, Aany and Tanya) interviewed at stage 2 of the method. This section provides examples of the answers Tanya gave to Hope when she followed the aforementioned procedure, for 2 observations and for statements 2 and 3. The 2 observations that she needed some clarification on were:

1. open, friendly environment
2. informal dressing

By following the aforementioned procedure, Hope asked Tanya the following questions and received the following responses:

1. Do you think that the environment here is open and friendly? *Why? Example?*

*“Yes, I think we do have a very friendly attitude towards each other and to new comers. I think we just evolved to be this way and in my opinion it all comes down to our line manager. She is very open and friendly. I remember when I first started working here, I was very quite and withdrawn. But quickly I felt comfortable and I can only attribute this to how my boss was towards the others and me. She comes around and jokes. She knows personal things about us and remembers them. ”*

3. How come do you all have such an informal dressing style? Do you dress like that even when you interact with customers?

*“The philosophy in our company is to wear what makes you feel comfortable. I guess if you are comfortable, you work better. I wear very casual clothes, because I am comfortable in them. I know some people wear suits because they are comfortable wearing suits. Yes, even if we interact with customers...however this is rarely the case”.*

By following the procedure of the culture mining approach, Tanya offered the following reasons as to why she responded that she agrees with statement 2 and strongly disagrees with statement 3:

2	Good results are rewarded.						
	A	B	C	D	E	F	G
	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3	Deadlines are loose and flexible.						
	A	B	C	D	E	F	G
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

Table 6.7: The responses of Tanya to statements 2 and 3

- a. Why do you think good results are rewarded in Success Plc. (statement 2)? Can you please give me an example?

*“I know employees who have worked hard and produced good results that received bonuses for their effort. I have received bonuses myself and they are generous. I think the company believes that if they reward people for good results they will work harder, which I think actually works. It sure does give me the motivation to work harder and I do when I think of the bonuses. I also know that my colleagues feel the same way”.*

- b. Why do you think that deadlines are not loose and flexible at all (statement 3)? Can you please give me an example?

*“Because there have been many cases that people had to work throughout the night because their line manager expected them to finish something by the next day. It has happened to me as well. I had to prepare something, but it took much longer than I estimated and when I went and discussed the difficulties I had and that I needed more time, it wasn’t given to me. So I didn’t sleep at all that night”.*

Hope then used Tanya’s answers, presented above, to the textual descriptions of the results about statements 2 and 3 from the previous stage. The outcome is the following:

For statement 2, she found that 67% of the employees of Success Plc agree and 33% tend to agree with statement 2. Hence, the majority of the employees believe that good results do get rewarded. According to Tanya, there have been employees, including herself, that have received bonuses for their efforts, something which justifies the high percentage of employees believing that good results do get rewarded in Success Plc.



For statement 3, she found that 67% of the employees of Success plc strongly disagree and 33% disagree with statement 3. Hence, the majority of the employees strongly believe that deadlines are not loose and flexible. According to Tanya, there are many occasions where employees asked for an extension of a deadline and it was not given to them, which justifies why the majority of the employees strongly believe that deadlines are not loose and flexible.

The following part of the chapter presents the modelling technique, which structures the data collected through the elicitation technique and identifies potential culture-related problems.

## 6.5 Modelling technique

The second part of the CAREs method is the modelling technique, which involves the modelling of the key elements of the culture of a company that implements an ERP system. Its aim is to identify and explain potential culture-related problems. I present the modelling technique by describing its 4 stages as shown in figure 6.4.

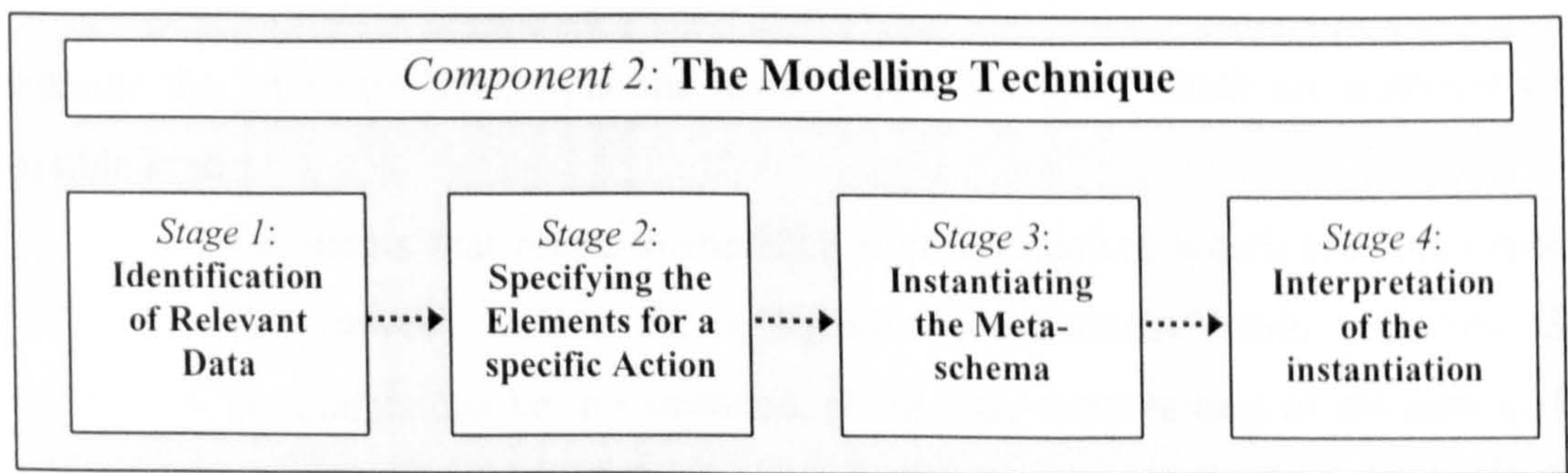


Fig 6.4: The 4 stages of the modelling technique and their relationship (which is depicted with an arrow). See figure 6.1 for the association of each of those 4 stages with the stages of the other 2 components of the CAREs method

### 6.5.1 Identification of relevant data

This stage involves identifying the relevant data from the corpus of information collected from the previous part of the method.



#### 6.5.1.1 Purpose

The purpose of this stage is to identify relevant data by analysing the transcribed interviews that resulted from the background questionnaire (see figure 6.1). The relevant data are necessary for the subsequent stages of the modelling technique. This approach has similarities to content analysis where various kinds of data are labelled and classified in order to structure an extensive corpus of information (Patton, 1990). This stage of the modelling technique has to take place before the 3 other stages take place.

#### 6.5.1.2 Outcome

The outcome of this stage is a collection of statements either about the ERP implementation or about the culture of the company that will implement this ERP system.

#### 6.5.1.3 Procedure

The procedure is:

1. Examine the interview transcripts and identify relevant data, which are statements of 2 possible kinds:
  - a. statements that relate to the ERP implementation, which are comments the interviewees made to the background questionnaire (main questions). Such comments can be, for instance, about their expectations of the new system, about the implementation process, or the training they will receive.
  - b. statements that relate to the culture of the company derive from the interviewees' answers to the background questions (main questions). Such statements can be, for instance, about the 'way things are done' within the company, the prevailing climate, issues of importance for that company, etc.
2. Read through the interviews again and underline the relevant data, based on the aforementioned clarification of the 2 possible kinds of statements.
3. Label and classify the identified relevant data to structure the extensive corpus of information. This can be achieved by going through the underlined data and labelling to which kind of data each of the underlined statements belongs (ERP implementation or culture related).



6.5.1.4 Example

Hope followed the aforementioned procedure to identify the relevant data from the answers of Tanya to the background questionnaire, presented in section 6.4.2.4. She highlighted the relevant data and labelled them accordingly (grey for statements about the ERP implementation, blue for statements about the culture). (Please note that for the purposes of this example, I provide in brackets the rationale for each of the highlighted relevant data).

- Culture

a. How was the ERP implementation decided?  
*“It was just decided because Success Plc. got larger and we couldn’t develop more the previous system. Another factor was that the headquarters wanted to implement the same system across all the offices and subsidiaries and the ERP system was selected as being the best one. The decision was announced to us without us contributing at all to the selection of the new system”.* (This statement demonstrates how decisions are taken and communicated within this company)
- Implementation

b. How do you think your roles and responsibilities will change as a result of the ERP implementation? For example? Why?  
*“I am employed now as a hotline sales person. My roles are very much restricted. I hope now my job will expand and I will be able to have more responsibilities and interesting things to do* (this statement reveals an expectation that the agent has about how her/his job will change because of the new system). *I think they will expand because I have been working here for quite some time and I have shown that I can do things well. Good work is appreciated”.* (This statement demonstrates that good work in this culture is appreciated and rewarded).
- Culture

d. What do you think are the essential benefits that will arise as a result of the ERP implementation? Why, do you think?  
*“I think it will make sales order entries much quicker* (expectation on the new system), *not just because the whole system will be faster but also because the new system is according to what I have been told the latest technology* (expectation on the new system). *So it is bound to be better than what we had. So, if it is quicker, we will be able to take more orders, which will increase the company’s competitive advantage. This is crucial for a company”.* (This statement demonstrates what is important for this culture).



## 6.5.2 Specifying the elements for a specific action

When a company implements an ERP system, the implementation team models both the current and the new business processes. The changes in the business processes will be manifested to the employees through the actions performed as part of their job. This stage involves identifying, for every change in the actions, the elements of culture associated with it.

### 6.5.2.1 Purpose

The purpose of this stage is to specify the elements of culture associated with every action that will be affected. These elements of culture can give rise to culture-related problems.

### 6.5.2.2 Outcome

The outcome of this stage is a list of some of the elements that are incorporated in the meta-schema of culture, for each action that will be affected by the change in the business processes.

### 6.5.2.3 Procedure

The procedure is:

1. Identify the actions that will change because of the new business processes;
2. For each changed action, identify the implicit elements from the meta-schema of culture that are associated with it. Each action can have one or more sets of elements associated with it. It is advisable to start from the most implicit elements; values, beliefs and norms (see generic model of culture in chapter 3) because their violation gives rise to the potential culture-related problems in ERP implementations. In order to identify the implicit elements, 4 steps have to be followed:
  - a. from the relevant data, identify an expressed expectation about the new system and why it is important. This expectation must be expressed by the agent who relates to the changed action (identified in the first phase of this procedure-see 1 above)



- b. this expectation is really a norm, as a norm in this context is really an expectation of an agent about the new system or the ERP implementation (see definition in chapter 3). Please make a note of this norm.
  - c. from the interviewing data, identify the explanation of why the agent has this expectation, which is a belief. A belief in this context is the opinion of an agent about an expectation. Please make a note of this belief.
  - d. a value is expressed through the norm. A value in this context underpins what is important to happen for this expectation (norm) to be met. Please make a note of this value by starting “*it is important that....*”
3. Specify the rest of the elements in the meta-schema by studying their definitions and examining the relevant data (identified in the previous stage) and the answers of the interviewee(s) to the background questionnaire (introductory questions).
  4. Create a list for all the actions affected by the new business processes and their associated elements as specified in this stage;

#### 6.5.2.4 Example

Hope identified the actions that will change in Success Plc because of the new business processes. One of the affected actions is “sales order entry” (in this example we only concentrate on this action). She ascertained that the agent associated with this action is the employee called Tanya. In order to identify the implicit elements associated with this changed action, she followed the aforementioned procedure, as shown below:

- a. the expectation identified is *“I think the new system is faster and of the latest technology and so it will make sales order entries much quicker.”* For this agent, it is important because *“more orders will be taken and this will increase competitive advantage which is crucial for a company”* (the quotes are taken from the example in section 6.5.1.4);
- b. the expectation, which is the norm is: “sales order entry will be quicker because the new system will be faster and of the latest technology” (highlighted in the data with grey);
- c. the explanation of this expectation is the belief: “if system is faster, more sales orders will be taken and this will increase the company’s competitive advantage” (highlighted in the data with yellow);

- d. for the expectation to be met: “it is important that the new system is faster and of the latest technology”, which is the value (the values were obtained by looking at the norm, and identifying how it can be satisfied);

Moreover, by studying the other definitions of the elements in the meta-schema and by examining the relevant data (see section 6.5.1.4) Hope identified more elements. Here, I provide a small example of the other elements Hope identified:

1. Role: sales personnel (which is Tanya’s job role, discovered when asking her the introductory questions of the background questionnaire – section 6.4.2.4)
2. Responsibilities: dealing with customer orders and enquiries, deliveries by phone or fax (which is the job responsibilities of Tanya as elicited when asking her the introductory questions of the background questionnaire – section 6.4.2.4)
3. Object: ERP system (which this agent uses in order to perform her action)
4. Event: ERP implementation (which is what triggered Hope to use the CAREs method).

### **6.5.3 Instantiating the meta-schema**

This stage instantiates the meta-schema of culture with the elements specified in the previous stage and their inter-relationships, which are depicted in the meta-schema. The resulting instantiations will include the key elements of culture associated with an action that are affected by the new business processes.

#### **6.5.3.1 Purpose**

The purpose of this stage is to model the concepts specified in the previous stage using instantiations of the meta-schema of culture.

#### **6.5.3.2 Outcome**

The outcome of this stage is a number of instantiations of the meta-schema for the actions that will be affected by the new business processes, which illustrate potential culture-related problems.



### 6.5.3.3 Procedure

The procedure is three-fold:

1. Study the list produced from the previous stage and the meta-schema of culture in order to identify which elements will be modelled.
2. Create an instance for each of the elements in the list by reproducing little boxes that include the name of the element (for e.g. norm, value) and its description underneath. Repeat until all the elements that were identified in the previous stage have been illustrated in boxes.
3. Add the associations (arrows) between the elements, (which are in boxes), as illustrated in the meta-schema;

### 6.5.3.4 Example

Hope used the elements she specified in the previous stage, and by following the aforementioned procedure, she created an instantiation of the meta-schema for the action of “sales order entry”. The steps she followed are show below:

1. Hope had a list of the following elements:
  - a. Agent
  - b. Action
  - c. Value
  - d. Norm
  - e. Belief
  - f. Role
  - g. Responsibilities
  - h. Event
  - i. Object
2. Hope produced instantiations of each of the elements above. Figure 6.5 illustrates the outcome of this stage:

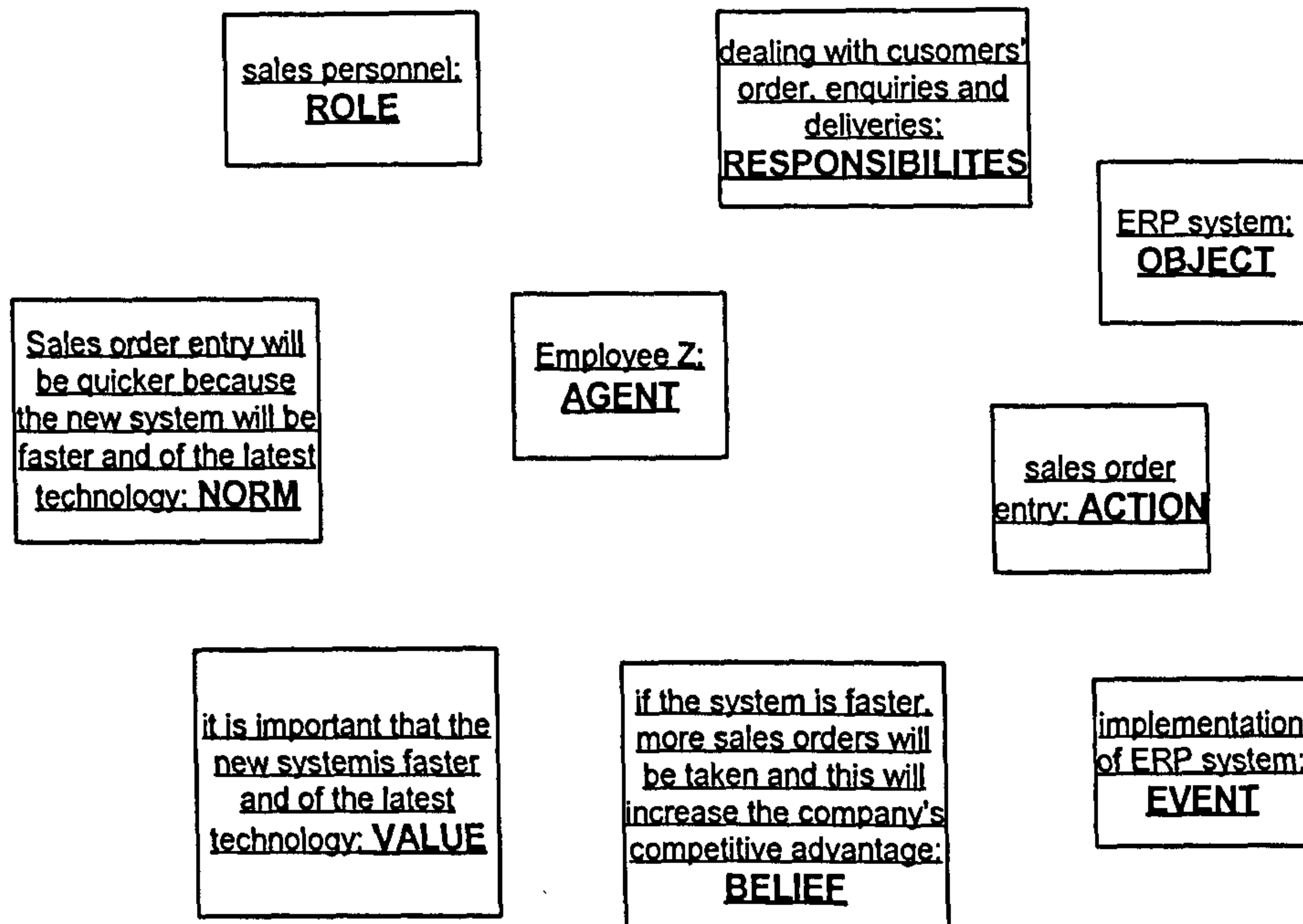


Fig. 6.5: the instantiations of the elements

Hope then added the associations between the elements she instantiated. Figure 6.6 shows the completed instantiation of the meta-schema for this action.

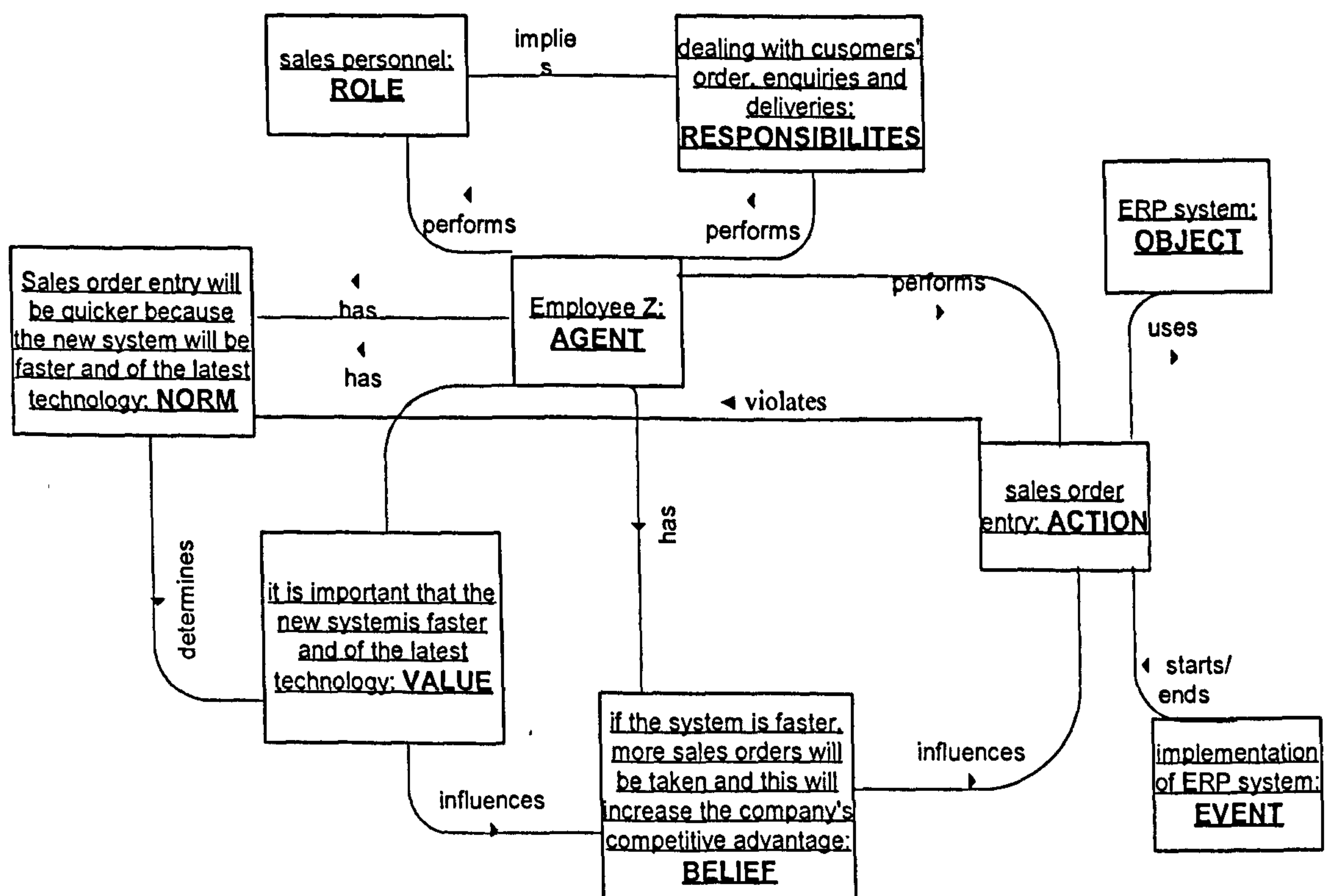


Fig. 6.6: An example of an instantiation of the meta-schema



## **6.5.4 Interpretation of the instantiations**

The final stage interprets each instantiation to identify potential culture-related problems. The example at the end of this section is a good reference guide for interpreting instantiations.

### **6.5.4.1 Purpose**

The purpose of this stage is to recognise the potential culture-related problems that may arise by the affected action.

### **6.5.4.2 Outcome**

The outcome is a list of potential culture-related problems and their possible explanations behind them.

### **6.5.4.3 Procedure**

The procedure to follow for each action is:

1. Discover all the instantiations associated with an action affected as a result of the new business processes. There can be one or more instantiations related to that specific action.
2. Detect the element “norm” of an agent, within the selected instantiation(s), which is depicted as getting violated by this change in the action.
3. Make a list of all the identified violated norms from step 2, as they are the reason for an agent’s reaction to the changed action. As norms are expectations of an agent, the fact that these expectations have not been met, are the explanations behind an agent’s reaction.
4. Refer to the results of the culture-statement questionnaire and to the answers of the associated agent to the culture mining approach. More specifically, one has to follow the following 3 steps (the example that follows is a good reference point for following this procedure):
  - a. from the analysis of the culture-statement questionnaires, identify the statements that received a high percentage of responses that the interviewees

- agreed (responses A, B and C) or disagreed (responses E, F and G) with those statements (total above 75%)
- b. for those statements, identify the answers of the associated agent(s) to the culture mining approach
- c. detect potential association of those answers to the violated norm(s). For example, one may ask “if this norm gets violated, will the agents react because he believes ... (which is the statement and its rationale)?”
- d. the associated answers reveal a deeper explanation of why the agent will react if her/his norm gets violated. Add these explanations to the list of the identified violated norms (from step 3 of the procedure).

#### 6.5.4.4 Example

Hope produced an instantiation of the meta-schema for the action “sales order entry”. The new business processes will make the action of sales order entry slower because the sales personnel will have to navigate through many screens to complete an order. Hope followed the aforementioned procedure to interpret the instantiation for this action in order to identify a potential culture-related problem (stage 1 of the procedure). Hope then detected the relevant norm in this instantiation of the agent “sales personnel”, which is “sales order entry will be quicker because the new system will be faster and be of the latest technology (stage 2 of the procedure). This norm will be violated because the new business process will make the action of sales order entry slower, which is why the agent will react. The expectation of the new system and how this will improve sales order entry will not be met, therefore the agent is likely to react to this (stage 3 of the procedure).

Hope wants a deeper explanation of why and how the agent’s (Tanya) norm (expectation) gets violated (stage 4 of the procedure), therefore she followed the above procedure:

- a. She identified (from section 6.4.3.4) statement 2 had a high percentage of employees agreeing with it and statement 3 had a high percentage of employees disagreeing with it (step a of stage 4 of the procedure).
- b.+c. Then she looked at the associated agents’ responses for those 2 statements (section 6.4.4.4), from the culture mining approach (step b of stage 4 of the procedure). She found for statement 3, that if this agent’s norm gets violated, the agent will not react because deadlines are not loose and flexible (step c of stage 4 of the procedure). However, she found for statement 2, that the agent might react if good results are rewarded (step c of stage 4 of the procedure).
- d. Therefore, it can be argued that the agent will react to this violation of the norm



because if sales order entry becomes slower, then the employee will not be able to take as many orders as s/he would wish. This means that s/he wouldn't produce good results and hence not receive any bonuses (step d of stage 4 of the procedure). Hope added this deeper explanation of the agent's reaction to the associated norm of the list of all violated norms for that action (step 3 of the procedure).

Now that Hope knows why this agent will react to the violation of her/his norm as a result of the changed action, she wanted to find out the level of this reaction. So she referred to the Cultural Predictions (CUP).

## **6.6 Cultural predictions (CUP) for different national cultures**

The CUP (CULTural Predictions) constitute the final part of the CAREs method. The results from the studies that were reported in chapters 4 and 5 demonstrated that when the agents' norms are violated, culture-related problems arise. The purpose of the CUP is to predict an agent's level of reaction to the violation of her/his norm as a result of the change to an action, because of the ERP implementation. Hence, for the cultural predictions to be valid, I assume that the following condition must be met:

*A norm of an employee, or a group of employees, has to be violated.*

The level and nature of this reaction, I hypothesise can be predicted by looking at the scores of the different countries in the dimensions for national culture (Hofstede, 1994). These dimensions reveal important information about peoples' behaviours in those countries. For this part of the method to take place, the previous stage of the method must be completed.

In this part of the CAREs method, I provide a brief synopsis of the dimensions for national culture by Hofstede (1994). Then I present the procedure for generating the cultural predictions for different national cultures.

### **6.6.1 A synopsis of the dimensions for national culture**

The dimensions of national culture by Hofstede (1994) were presented in detail in chapter 2. In this chapter, I provide a brief synopsis of these 5 dimensions, which are the following:

6.6.1.1 Power Distance Index (PDI)

PDI indicates the extent to which a society accepts the fact that power in institutions is distributed unequally among individuals. Table 6.8 offers examples of the characteristics of cultures with large and small PDI.

Large PDI	Small PDI
High dependence needs	Low dependence needs
Inequality accepted	Inequality minimised
Hierarchy needed	Hierarchy for convenience
Superiors often inaccessible	Superiors accessible
Power-holders have privileges	All have equal rights
Change by revolution	Change by evolution

Table: 6.8: The characteristics of large and small power distance cultures

6.6.1.2 Individualism Index (IDV)

It indicates the extent to which a society is a loose social framework in which people are supposed to take care only of themselves and their immediate families, instead of a tight social framework in which people distinguish between in-groups and out-groups and expect their in-work to look after them. Table 6.9 presents example characteristics of cultures with high and low IDV.

Individualism (High IDV)	Collectivism (Low IDV)
“I” conscious	“We” conscious
Private options	Relationships over tasks
Fulfil obligations to self	Fulfil obligations to group
Loss of self-respect, guilt	Loss of “face”, shame

Table 6.9: The characteristics of high and low individualism cultures



6.6.1.3 Masculinity Index (MAS)

This index indicates the extent to which the dominant values in a society tend toward assertiveness and the acquisition of things, and away from concern for people and the quality of life. The dimension was labelled “masculinity” because, within nearly all of the 50 countries, men were more likely to score higher on these values than women. Hofstede found that the more a nation as a whole is characterised by masculine values, the greater the gap between the values espoused by men and women in that nation. Table 6.10 provides an example of the characteristics of high and low masculinity cultures.

Masculinity (High MAS)	Femininity (Low MAS)
Ambitious and a need to excel	Quality of life, serving others
Tendency to polarise	Striving for consensus
Live in order to work	Work in order to live
Big and fast are beautiful	Small and slow are beautiful
Admiration for the achiever	Sympathy for the unfortunate
Decisiveness	Intuition

Table 6.10: The characteristics of high and low masculinity cultures

6.6.1.4 Uncertainty Avoidance (UAI)

This index indicates the extent to which a society feels threatened by ambiguous situations and tries to avoid them by providing rules, believing in absolute truths and refusing to tolerate deviance. Table 6.11 shown examples of the characteristics of strong and weak UAI cultures.

Strong UAI	Weak UAI
Anxiety, higher stress	Relaxed, lower stress
Inner urge to work hard	Hard work not a virtue per se
Showing emotions accepted	Emotions not shown
Conflict is threatening	Conflict & competition seen as fair play
Need for consensus	Acceptance of dissent
Need to avoid failure	Willingness to take risks
Need for laws and rules	There should be few rules

Table 6.11: The characteristics of strong and weak uncertainty avoidance cultures

6.6.1.5 Confucian Dynamism (CDI)

It indicates the extent to which a society exhibits a pragmatic future-oriented perspective rather than a conventional historic or short-term point of view. Table 6.11 provides example characteristics of low and high CDI cultures.

Low CDI	High CDI
Absolute truth	Many truths (time, context)
Conventional/traditional	Pragmatic
Short term orientation	Long-term orientation
Concern for stability	Acceptance of change
Quick results expected	Perseverance
Spending for today	Thrift for investment

Table 6.12: the characteristics of high and low Confucian dynamism cultures

6.6.2 The procedure for generating CUP

The procedure for creating CUP in relation to an agent’s violated norm, identified and explained in the previous part of the CAREs method, is presented below. The outcome is a list of CUP that predict the level of reaction of this agent, depending on her/his national culture.

1. Detect the norm from the instantiation that will be violated by the change in an actions, as a result of the new business processes;
2. For each country of interest (the country where the company that implements an ERP system is based in), identify the applicable scores of the national culture of that country on each of the selected dimensions (PDI, IDV, MAS, UAI and CDI) (see appendix 6.3 for the scores of the national cultures of various countries on the 5 dimensions, as determined by Hofstede);
3. Check the score on each of the dimensions against their principal predictions so to identify the agent’s level of reaction (see appendix 6.4 for the rationale behind these 5 principal predictions for each dimension) and select the ones, which increase a reaction.



Disregard the dimensions where the score is average (around 50) and those that decrease a reaction. This can be achieved through these 5 guidelines:

- a. For the PDI, check the score against the PDI principal prediction, which is:  
*“As PDI decreases (closer to zero) the stronger the reaction, as PDI increases (closer to 100) the weaker the reaction”;*
- b. For the IDV, check the score against the IDV principal prediction, which is:  
*“As IDV increases (closer to 100) the stronger the reaction, as IDV decreases (closer to zero) the weaker the reaction”;*
- c. For the MAS, check the score against the MAS principal prediction, which is:  
*“As MAS increases (closer to 100) the stronger the reaction, as MAS decreases (closer to zero) the weaker the reaction”;*
- d. For the UAI, check the score against the UAI principal prediction, which is:  
*“As UAI increases (closer to 100) the stronger the reaction, as UAI decreases (closer to zero) the weaker the reaction”;*
- e. For the CDI, check the score against the CDI principal prediction, which is:  
*“As CDI decreases (closer to zero) the stronger the reaction, as CDI increases (closer to 100) the weaker the reaction”;*

4. Formulate a CUP for each relevant dimension in the following form:

*“If this norm is violated in a company in country X (where country X is the country of interest), then it is likely that the agent will react strongly/weakly (select accordingly)”.*

5. Examine the rationale of the principal predictions (appendix 6.4), and provide a possible explanation behind this CUP, as explained in the rationale.

The above procedure is explained thoroughly in the following section with the use of an example.

### 6.6.3 Example of the procedure for generating CUP

Hope identified that because of the new business processes in Success Plc, the action of “sales order entry” will be affected. The new business processes will make the action of sales order entry slower, which implies that the agent’s norm “sales order entry will be quicker because the new system will be faster and be of the latest technology”, will be violated. Hence, the agent will react to this violation. The level of the agent’s reaction depends on her/his country

of origin. In this example, the agent is an employee of Success Plc, which is situated in the UK. Hope followed the procedure step by step to generate the relevant CUP.

1. Hope detected the norm, which is “sales order entry will be quicker because the new system will be faster and be of the latest technology”;
2. Hope then identified the scores of the national culture of the UK in the 5 dimensions, which are:

Country/ dimensions	UK
PDI	35
IDV	89
MAS	66
UAI	35
CDI	25

Table 6.13: The scores of the UK at the 5 dimensions

3. Hope checked the scores and identified the dimensions that indicate a strong reaction by the agent to the violation of this norm. These dimensions are PDI (low score), IDV (high score) MAS (high score) and CDI (low score). These dimensions were selected because their scores increase a reaction, whereas the remaining one decreases it (UAI).
4. Hope then formulated a CUP about the level of reaction of the agent whose norm is violated in the UK are:

*“If this norm is violated in an organisation in the UK, then it is likely that the employees will react and maybe reject the system. For example use external applications, use the old system, and will feel very frustrated, etc”.*

6. Hope then also decided to check the rationale (appendix 6.4) behind the principal prediction, to find a possible explanation of the agent’s reaction in that particular country. She found:

*For this specific CUP, the reason why the employees are likely to react if the norm is violated, can be explained and attributed mainly to the 4 dimensions; PDI, IDV, MAS and CDI. UK has scored low in PDI, which might make the employees react more in the way of complaining to their superiors, as they are accessible. UK has scored very high in IDV, which implies that employees might*



*react if their norm is violated but for different reasons than PDI. People in high IDV cultures, like the UK, are very much "I" conscious and self-achievement is very important. The violation of a norm like that will make employees react as they will feel that they will not have a system quick enough to perform their job well, and hence feel frustrated. This might lead individuals using external applications or their old system for example. Moreover, UK has a high MAS score which implies that people from this culture are quite competitive so a slower sales order entry will imply them being less competitive and will therefore frustrate them significantly. Additionally, the low score at the CDI indicates that employees in the UK are concerned with stability, and the new system changes the stability they had with the old system; taking sales order quick enough.*

## **6.7 Method summary**

An overview of the CAREs method was presented in this chapter. The CAREs method is comprised by 3 main components. Firstly, it consists of a technique for eliciting the national and organisational culture of a company as well as information about the ERP implementation that will take place. Secondly, it offers an approach to model and analyse the elements of that company's culture and its expectations of the new system. Finally, the CAREs method presents a technique for identifying a set of generic cultural predictions for each national culture, which serves as a checklist of culture-related issues that could arise during ERP implementations.

The ultimate aim of the method is to inform an ERP implementation team about the culture-related problems that may arise. In figure 6.1, the outline of the CAREs method was illustrated. The 3 parts of the method are able to provide a holistic approach for implementing ERP system in different national and organisational cultures. The culture elicitation part of the method elicits information about the culture of the company that will implement the ERP system as well as the expectations of the agents. By modelling the expectations for each action affected by the new business process, it is possible to recognise potential culture-related problems. This can be achieved through understanding the agent's reaction when her/his norm gets violated. Moreover, the generic cultural prediction can foresee the level of the agent's reaction to this violation. I hypothesise that the instantiations of the meta-schema, together with the generic cultural predictions can provide useful advice for handling culture-related problems in ERP implementations.

The utility of the method remains to be evaluated. The following chapter describes the evaluation of the CAREs method to test its utility, effectiveness and usability.



# Chapter 7

## Evaluation of the CAREs Method

This chapter describes the studies carried out to evaluate the CAREs method.

# Chapter 7

## Evaluation of the CAREs Method

### 7.1 Introduction

A significant component of this thesis is the evaluation of the CAREs method. This chapter reports on an initial evaluation of this method to test hypothesis five (H5):

**H5** The CAREs method can provide utility in ERP implementation projects to identify, explain and predict culture-related implementation problems.

Utility defines the usefulness that the 3 components of the method can provide to ERP implementation teams in identifying, explaining and predicting culture-related implementation problems. I argue that for the components of the method to be useful to ERP implementation teams, they also have to be usable (ease of use) and effective (successful). The level of utility and hence, effectiveness and usability of the 3 components of CAREs, was determined by expert evaluation.

This chapter is organised as follows. Section 7.2 describes the study method followed in order to test hypothesis five (H5). Section 7.3 discusses the results from the evaluation and section 7.4 reviews the experts' advice on CAREs method. Finally, section 7.5 draws conclusions as a basis for future research.

### 7.2 Study method

The CAREs method was tested using expert evaluation to obtain feedback on its utility. Three ERP implementation scenarios were selected to evaluate all 3 components of the method by 3 ERP implementation experts. The evaluation studies were conducted with each expert individually, one day for each expert.

Each evaluation was a 6-phase process, of which phases 3, 4, 5 and 6 were repeated for each of the 3 scenarios. Figure 7.1 describes this process.



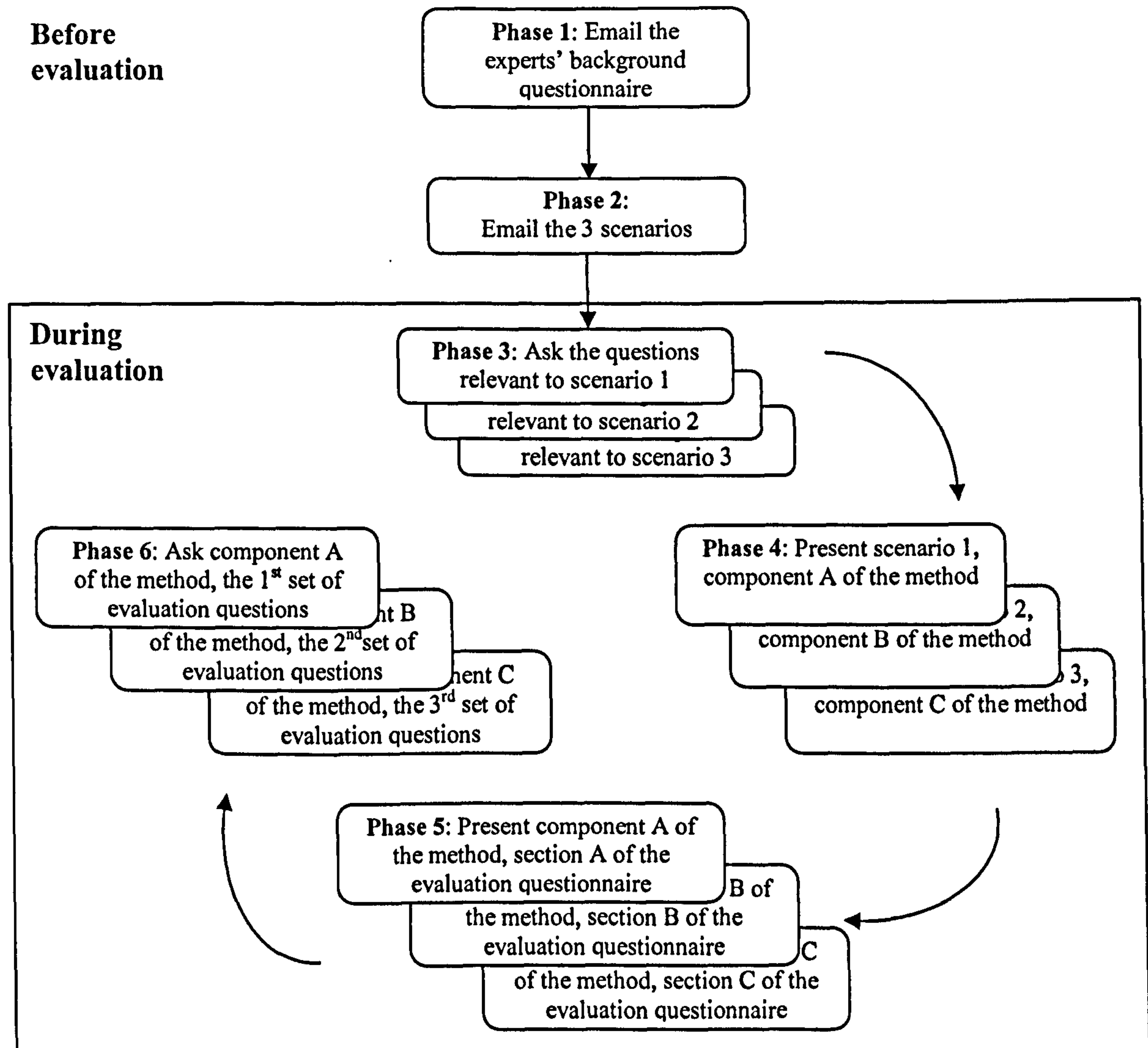


Fig. 7.1: The 6-phase evaluation process followed for each expert; the first 2 phases were completed before the day of the evaluation whereas the remaining 4 during the evaluation studies

### 7.2.1 Phase 1: experts' background questionnaires

This phase gathered background information from the 3 experts.. A questionnaire was prepared to elicit information about their current position and previous experience with ERP systems. The complete background questionnaire is presented in figure 7.2. Each of the 3 experts received an e-mail with the background questionnaire which they filled in before the evaluation.



Experts' background questionnaire

Instructions: Please provide a copy of your CV and answer all questions giving details where necessary.

Name	
Organisation	
Role in Organisation	
Sex (M/F)	

ERP experience

Number in years	
-----------------	--

ERP application areas worked on

Area	Please tick if relevant	Please give details
Implementation		
Training		
Research		
Education		
Development		
Design/evaluation		
Other (give details)		

ERP packages

ERP	Please tick if relevant	Please give details (version, function areas, modules, etc.)
SAP		
PeopleSoft		
Baan		
Oracle		
J.D. Edwards		
Other (give details)		

Additional Information

Please, if relevant, provide any other information that you consider relevant from your background and has not been mentioned here

Fig. 7.2: Experts' background questionnaire



### **7.2.2 Phase 2: circulation of the 3 scenarios**

This phase involved circulating the 3 ERP implementation scenarios to each expert. The 3 scenarios described ERP implementation case studies in different organisational and national cultures. The case studies were described in sufficient detail to allow implementation issues to be inferred and reasoned about by the experts. The 3 scenarios were based on the studies reported in chapter 5.

The general objective of all 3 scenarios was to determine the utility of each of the 3 components of the method. Hence, one scenario evaluated the elicitation technique, one evaluated the modelling technique, and one evaluated the accuracy of the CUP (CULTural Predictions). Thus, the 3 scenarios covered all 3 components of the method. The 3 scenarios were circulated to each expert before the day of the evaluation so that s/he could get acquainted with them beforehand.

#### **7.2.2.1 Scenario 1**

Scenario 1 was designed to evaluate the elicitation technique of the CAREs method:

“You are one of the consultants for Company A that is implementing SAP R/3. The Warehouse Management (WM) module is being implemented, however there are difficulties with the way that R/3 is being accepted in the warehouse. The warehouse employees resist working with R/3 and there are many delays in organising the products in the warehouse and delivering them to customers. This has a knock-on effect on the whole organisation, for example the high level of complaints received from customers.”

The objective of scenario 1 was to determine the utility of the culture elicitation technique. Scenario only defined a few details about difficulties in the warehouse and no information at all about its culture. The aim was to find out what the experts would do in this situation, and what techniques they would use to tackle it, and to present the experts with an example of what the culture elicitation technique can offer.

#### **7.2.2.2 Scenario 2**

Scenario 2 was designed to evaluate the modelling technique of the CAREs method:

“The warehouse of company B, based in Sweden, has gone live with SAP’s R/3. You, as the consultant for the warehouse, have conducted interviews and have found out that:

- One year before the implementation the warehouse of company B moved to its current location, which resulted in most of the employees resigning.
- Company B had to employ new warehouse personnel and train them to use the old system. The warehouse personnel realised that the work is done “out there” in the warehouse and that they were expected to perform physical tasks such as moving products.
- The new warehouse personnel had then to be accustomed again to a new system and to a new way of doing things, but there was not enough time to train them in the use of the new system. The understanding of working “out there” still prevailed. This reflected a problem - warehouse staff had to spend more time using the system and less time being “out there” in the warehouse. The warehousemen were accustomed to doing physical tasks, and the fact that this has changed, was frustrating them.
- The warehouse personnel expected that R/3 would change the nature of the work for the better, by reducing administrative work and organising physical tasks. However, the reality did not match their expectation and all warehousemen realised that they would have to use the system regularly.
- The efficiency in the warehouse has decreased dramatically. Many of the warehouse employees have experienced stress, frustration and lack of job satisfaction.”

The objective of scenario 2 was to determine the utility of the modelling technique in recognising and describing culture-related problems that arise as a result of an ERP implementation. Scenario 2 described implementation problems but no information about the culture of the warehouse. It was designed to discover what the experts would do with the information provided, what techniques they would use to analyse the situation, and how the experts would discover the explanations behind the problems.

#### 7.2.2.3 Scenario 3

Scenario 3 was identical for all 3 experts apart from the countries in which the scenarios were based, which were chosen according to each expert’s work experience, identified beforehand. For expert A, Australia and the UK were chosen. For expert B, Germany and the UK were selected. For expert C, Spain and Germany were chosen. This was to ensure an objective evaluation of the CUP (CULTural Predictions). The CUPs referred to countries where the experts had experience with the culture but also experience with ERP implementations.

Scenario 3 was designed to evaluate the CULTural Predictions (CUP):



“You are a consultant for a multi-national organisation C that is implementing SAP’s R/3 across its subsidiaries in Australia/Germany/Spain and in the UK/Germany. Both subsidiaries have the same number of employees and the same annual turnover. Company X is their implementation consultant and you are a member of the X’s team consulting at organisation C. Both subsidiaries are implementing exactly the same SAP modules. The only main difference between the two subsidiaries is that they are the same organisation, based in two different countries.”

The objective of scenario 3 was to explore the accuracy of the CUP to predict the level of reaction of the employees in different countries when similar culture-related problem arose. Therefore, scenario 3 contains little detail about the cultures of the countries of the subsidiaries. The scenario was used to discover what the experts would do different in each ERP implementation.

In the following 4 sections, I present the phases of the evaluation process that took place during the evaluation studies. As shown in figure 7.1, the final 4 phases were repeated for each of the 3 scenarios. I completed first, phases 3, 4, 5 and 6 for scenario 1, before repeating these 4 phases for the scenario 2 and then for scenario 3.

### **7.2.3 Phase 3: questions on the 3 scenarios**

On the day of the evaluation study, each expert was briefly presented with each of the scenarios, then asked a set of questions about each scenario. These questions were designed to elicit what the experts would do in each case. This was in order to facilitate the comparison with the CAREs method in phase 4.

For scenario 1, the experts were asked the following questions:

1. What would you do in order to determine those difficulties described in scenario 1?
2. What techniques would you use?
3. What are the advantages and disadvantages of this way of finding out these difficulties?
4. Do you believe that by using these techniques you determine the difficulties described in scenario 1 and the explanations behind them?

For scenario 2, the experts were asked the following questions:

1. What would you do with the information described in scenario 2?

2. How would you analyse this situation?
3. What techniques would you use?
4. What are the advantages and disadvantages of using these techniques?
5. Do you feel that these techniques provide you an in depth insight into ERP implementation problems?
6. Do you feel that by using these techniques you would understand the reason why the warehouse personnel experiences stress, frustration and lack of job satisfaction?

Finally, for scenario 3, the experts were asked the following questions:

1. Would you do something different/extra in the implementation of R/3 for each of the subsidiaries, and if yes what?
2. From your experience, is there something that you are aware of that might cause specific national culture-related implementation problems in the different subsidiaries?
3. From your experience, do you believe the national culture differences of the different subsidiaries require a country specific implementation approach?

The interviews with each expert were tape recorded for future reference.

#### **7.2.4 Phase 4: presentation of the CAREs method**

During this phase of the evaluation process, the experts were presented different components of the CAREs method and an example of its outputs in order to explain it. For scenario 1, the elicitation technique was presented (see appendix 7.1). For scenario 2, the modelling technique was presented (see appendix 7.2, please note the remark on the stages of the modelling technique). For scenario 3, the Cultural Predictions (CUP) were presented (see appendix 7.3). The aim of this stage was to reveal to the experts, each of the 3 components of the CAREs method, so that they could evaluate them in phase 4.

#### **7.2.5 Phase 5: evaluation questionnaire**

Each expert was presented with an evaluation questionnaire (see appendix 7.4) divided into 3 sections, one section for each of the 3 components of the CAREs method. Each section consisted of questions that were intended to evaluate each component's usability (ease of use), utility (usefulness) and effectiveness (level of success). The experts were asked to



answer all of the questions by circling the appropriate number from the scale of 1-7 for each aspect and to give comments and examples with their answers if necessary.

The usability of each component of the CAREs method was evaluated using the 1<sup>st</sup> question of the evaluation questionnaire (see appendix 7.4, Question 1 for section A, B and C). Experts were asked to define the level of ease with which they could apply the different stages of each of the 3 components of the CAREs method, from a scale of 1-7. For this aspect, a “7” represents “very easy” to re-apply, a “1” represents “not easy” to reapply, with “4” representing the mean, namely “easy/uneasy” to re-apply, with the rest of the values in-between. A component of the CAREs method was determined to be usable if the majority of the experts’ responses about all its stages, is above the mean, 4.

The utility of each component of the CAREs method was evaluated using the 2<sup>nd</sup> question of the evaluation questionnaire (see appendix 7.4, Question 2 for section A, B and C). Experts were asked to define the level of usefulness of the different stages of each of the 3 components of the CAREs method from a scale of 1-7. For this aspect, a “7” represents “very useful”, a “1” represents “not useful”, with “4” representing the mean, namely “useful”, with the rest of the values in-between. A component of the CAREs method is determined to be useful if the majority of the experts’ responses about all its stages, was above the mean, 4.

Finally, the effectiveness of each component of the CAREs method was evaluated using the 3<sup>rd</sup> question of the evaluation questionnaire (see appendix 7.4, Question 3 for sections A, B and C). Experts were asked to define the level to which the results of the different stages of each of the 3 components of the CAREs method met their expectations. The scale was from 1-7. For this aspect, a “7” represents “yes” it did meet the promises, a “1” represents “no” it did not meet the promises, with “4” representing the mean, namely it “partly” met the promises, with the rest of the values in-between. A component of the CAREs method was determined to be effective if the majority, in terms of frequency, of the experts’ responses about all its stages, was above the mean, 4.

An example of part of the evaluation questionnaire, about the elicitation technique, is described below. The full questionnaire is in appendix 7.4:

1. With what level of ease do you perceive re-applying the following 4 stages of the elicitation technique?

a. Observations

Comments:

1 2 3 4 5 6 7

Not easy Very easy

b. Background questionnaire

Comments:

1 2 3 4 5 6 7

Not easy Very easy

Fig. 7.3: Part of the evaluation questionnaire, about the elicitation technique

## 7.2.6 Phase 6: questionnaire on the method

A structured interview (see appendix 7.5), was conducted with each expert as a follow-up to the evaluation questionnaire, of the previous phase. The questions investigated, for instance, how the experts would use each component of the method that was shown to them in phase 4, and to comment on how it could be useful for future ERP implementations. Example of the ‘method questionnaire’, about the elicitation technique is provided below:

1. Did you find the different stages of the elicitation technique useful? Why?
2. What are the advantages and disadvantages of each stage?
3. Do you think you could reapply the elicitation technique yourself?
4. What do you perceive to be the advantages and disadvantages of the elicitation technique? Why?

As shown in figure 7.1, phases 3-6 of the evaluation process were repeated 3 times, i.e. one time for each of the 3 scenarios.



7.3 Results

This section discusses the results from the evaluation studies conducted with the 3 experts. Firstly, I present information about the 3 experts from phase 1 of the evaluation process. Subsequently, I report the experts’ responses to each scenario and the method (phases 2, 3 and 4). Finally, I analyse the experts’ responses to the evaluation questionnaire and from their responses to the method questionnaire (phases 5 and 6).

7.3.1 Experts’ background (phase 1)

Three experts, with diverse backgrounds and experience on ERP systems participated in the evaluation studies. The first expert was a senior SAP human resources consultant based in the UK. The second expert was an ex-SAP consultant also based in the UK. The third expert was an associate professor in information systems with working experience on ERP systems’ implementations, who was based in Spain. All 3 experts completed the background questionnaire. A summary of their responses is provided in table 7.1 (the experts’ completed background questionnaires are provided in appendix 7.6). Please note that a tick (✓) represents that the expert has experience with that particular ERP package or area.

Expert	A	B	C
Role	Senior SAP HR consultant	Ex SAP consultant	Associate professor in information systems
ERP Experience	9	4	2
Application areas			
Implementation	✓	✓	
Training	✓	✓	✓
Research			
Education			✓
Development	✓	✓	
Design/evaluation	✓	✓	✓
Other		✓	
ERP packages			
SAP	✓	✓	✓
PeopleSoft			
Baan			
Oracle			
J.D. Edwards			
Other			✓

Table 7.1: The background of the 3 experts

### 7.3.2 Results from the 3 scenarios

This section describes results obtained during sections 2, 3 and 4. This section presents the experts' approaches on the 3 scenarios. The aim of this section is not to make any conclusions or comparisons between what the experts suggested and what the CAREs method proposes. Its aim is simply to reveal to the reader the basis of the experts' opinion on the CAREs method in contrast to their suggestions, when they evaluate it in the following section.

#### 7.3.2.1 Scenario 1

For scenario 1, expert A stated that *"I would talk to the people as it looks more like an issue problem and not as a software one"*. This expert also believed that new consultants should come and talk to the warehouse personnel rather than the previous ones. It seems that the previous consultants must have done something wrong and hence would be resisted by the people in the warehouse. Expert A claimed that *"I would just talk to the people and try and understand what the difficulties are"* because *"techniques as far as I know don't work, for example available implementation methodologies. If they did, problems like that wouldn't arise in the first place, and they do in real implementations as well"*. (For expert's A responses to the scenario questions, please see appendix 7.7, part A, section 1).

Expert B claimed, *"I would try and understand why the resistance exists. I would look at the complaints and the reason they exist"*. This expert would not use any specific techniques, as *"there are no specific ones for such situations really"*. However, the expert provided several suggestions on how to tackle this situation. First of all, this expert argued that it would be necessary to conduct interviews and disseminate questionnaires that would elicit the reasons for these problems. Moreover, expert B would talk to the warehouse management to find out how IT literate the warehouse employees were. Finally, from a technical perspective the expert would look at the different transactions. Expert B claimed that the main advantage of the approach is that *"you can understand why these problems exist. If you understand why then you have a higher chance of solving them"*. The main disadvantage is that *"you can get many different perceptions from many different people in the organisation which can lead to be confusing as it is difficult to manage all this information"*(expert B). Nevertheless, this expert believed that *"you can find out the soft issues and solve the problems"* if you use such an approach. (For expert's B responses to the scenario questions, please see appendix 7.7, part B, section 1).



Expert C said that *“I would prepare a questionnaire and send it around to the people in the warehouse. The questionnaire’s aim would be to find out the reason behind those difficulties and maybe possible suggestions from the employees for improving the situation”*. This expert would use techniques to help draft questionnaires. According to expert C, the advantages of such a technique are that *“first of all you have a chance of finding out what happened and what are the reasons for those difficulties. On the other hand though, there is always the risk that the employees will not answer truthfully because they might be scared. Another disadvantage may be that the questionnaire may not elicit the needed information up to the detail required in order to be able to deal with those difficulties. The reason is because I will prepare it myself and it will not be based on a special template for such situations”*. (For expert’s C responses to the scenario questions, please see appendix 7.7, part C, section 1).

#### 7.3.2.2 Scenario 2

For scenario 2, expert A claimed that the information described in this scenario *“definitely needs to be addressed with the management. I would talk to the management to make them understand the issues and convince them of finding a way to address them”*. This expert would have tackled the situation by *“trying to make the warehouse employees understand the potential reasons behind these problems, what the management and the consultants are planning to do to address those issues, and generally would try to make them feel valued”*. The problem with such an approach, according to expert A, is that *“it is not really a technique, all depends really on the depth and accuracy of the information the warehouse employees would give me”*. (For expert’s A responses to the scenario questions, please see appendix 7.7, part A, section 2).

Expert B believes that *“basically the problem is that they haven’t been trained plus that they have a preconception of how work should be done. As they haven’t been trained properly and hence they haven’t got an appreciation of what the new system could do, their expectations are based on what they were used to with the old system”*. This expert would have tried to talk to the warehouse employees to find out why the administrative work had increased and explain the reasons to them. Moreover, this expert would have tried to understand why there was a loss of job satisfaction and lack of training in the first place. In addition expert B would have used a questionnaire to help him achieve all of the above. Expert B believes that the advantage of such an approach is *“you have a chance of understanding more about what and why employees are not happy with the system. Moreover you can also explain to them or help them overcome these problems and become happier with their jobs”*. However, he argued that

*“the success depends on how much the employees want to open up”* (expert B). (For expert’s B responses to the scenario questions, please see appendix 7.7, part B, section 2).

Expert C *“would try and talk to the management and see what they think about the situation”*. She believes that *“either the employees have to be trained more or the processes have to change so to accommodate their needs”*. After talking with the management, this expert would have told the employees what was decided in order to improve the situation. According to expert C, the advantage of such an approach *“is that at least the employees would feel that we are trying to deal with the situation they are in”*. However, the problem was that *“the solution might not be the one that would change the situation to the extent the employees wish for”*. (For expert’s C responses to the scenario questions, please see appendix 7.7, part C, section 2).

### 7.3.2.3 Scenario 3

For scenario 3, expert A suggested 2 areas to investigate in each subsidiary. *“Firstly in terms of legislation. Also, I would try and deal with the people from each subsidiary in a way they are used to and understand, so to help them with the implementation process. This however only from my experience of working in these countries”* (expert A). According to this expert, resistance is a common reason for culture-related problems. *“However, there is a difference for me on how I should handle this resistance in the different subsidiaries. I think that in Australia people are more open than in the UK. In the UK people are more formal, so I would try to open them up and get the necessary information out of them. Hence, I would think that in the UK it is harder to bring issues to light”* (expert A). This expert believed that if there was a country-specific ERP implementation approach, *“it would be helpful as it might help overcome certain country specific problems, in terms of their mentality and the way they behave”*. *“For example, in Australia when employees have problems they tell me. Whereas in the UK, employees do not tell me. I have to call them and ask. If the implementation methodologies were different maybe certain problems could be avoided and hence employees wouldn’t have a reason to contact me, or would have a reason and would contact me”* (expert A). (For expert’s A responses to the scenario questions, please see appendix 7.7, part A, section 3).

Expert B proposed several areas to take into account in the implementation of R/3 in the 2 subsidiaries. *“First of all, I would ask the parent company what is it that it expects from the subsidiaries. Subsequently, I would send a higher-level questionnaire to a representative sample to both the UK and the German subsidiary. Moreover I would consider any*



*information I could get about the background, expectations, impacts, perceptions, experiences etc, about these 2 countries. Also, I would structure the implementation processes according to the information I would gather".* From this expert's experience, *"the mentality of the people"* can give rise to culture related problems. Expert B believed that a country-specific ERP implementation approach was definitely required as *"different countries have different expectations, different understandings so you need to have different approaches"* (expert B). (For expert's B responses to the scenario questions, please see appendix 7.7, part B, section 3).

Expert C *"would follow the suggested in the implementation methodologies, legislation and language differences"*. However, this expert would also have tried to communicate to the employees the implementation process in the best possible way, as there were no such techniques to help. *"From my experience, here is Spain, although the implementation is essentially the same, it has to be communicated in a different way because of differences in the mentality. What works in one country, doesn't necessarily work in another"* (expert C). According to expert C, a country-specific ERP implementation approach is needed, although there is none available. *"I personally believe that you cannot implement an information system, including an ERP, the same way in Germany and the same way in Spain for example. People are very different in these 2 countries, have a different way of working and are also used to a different way of behaving and communicating"*. (For expert's C responses to the scenario questions, please see appendix 7.7, part C, section 3).

### **7.3.3 Experts' evaluation of the CAREs method**

In this part of the chapter, I report responses to the evaluation and to the method questionnaires used in phases 5 and 6 of the evaluation process.

#### **7.3.3.1 The CAREs components' usability**

This section presents the results of the evaluation studies about the CAREs components' usability (ease of use). The usability of all 3 components of the method was evaluated using the first question of the evaluation questionnaire (appendix 7.4). This question was the same for each component of the method. The experts' responses to the evaluation questionnaire are in appendix 7.8 and to the method questionnaire are in appendix 7.9. A component of the CAREs method is usable if the majority of the experts' responses about all its stages, is above the mean, 4.

Elicitation technique

CAREs elicitation technique is divided into 4 stages; observations, background questionnaire, culture-statement questionnaire and culture mining approach. Table 7.2 shows the range of the experts' responses about the usability of each of those 4 stages of the elicitation technique.

Elicitation technique	Q1a (Observations)	Q1b (background questionnaire)	Q1c (culture-statement questionnaire)	Q1d (culture mining approach)
Expert A	7	4	3	4
Expert B	5	5	5	5
Expert C	5	6	6	3
Range	5-7	4-6	3-6	3-5

Table 7.2: The range of responses about the different stages of the elicitation technique's usability. (Question 1: "With what level of ease do you perceive re-applying the following...?" - 7: very easy and 1: not easy, the rest of the values in-between)

The observation stage was claimed to be more usable than the other stages, as the range of responses is higher (5-7), and for the same reasons the culture mining approach less usable.

The experts' responses about the usability of the observations range between 5 and 7. Expert A ranked this stage with a 7 and experts B and C with a 5. According to expert A *"especially the observations, I could re-apply them very easily, as they are very straightforward and simple to follow"* (expert A in appendix 7.9). Additionally, expert B claimed *"yes it is pretty clear what has to be done and how to do it, especially the observations"* (expert B in appendix 7.9). Expert C did not offer a justification for her/his answer. As all three experts' responses were above 4, which is the mean. Hence, it satisfies the criteria the observation stage was deemed to be usable.

The range of the experts' responses about the usability of the background questionnaire was 4 to 6. Expert A allocated a 4 because she believed that *"it would be somewhat time consuming and most valuable at the start of the implementations. All implementation consultants may not have the skills to carry this out"* (expert A in appendix 7.8). Expert C stated that she could re-apply *"the background questionnaire ... with no problems at all, as the instructions are very clear to me and also the interviewees would have no problem following it"* (expert C in appendix 7.9). As 2 of the 3 experts' responses were above the mean, the background questionnaire can be also considered as usable.



The experts’ responses about the culture-statement questionnaire were more diverse, ranging from 3 to 6. Expert A claimed that *“I am a bit worried about the culture-statement questionnaire as the clients might be a bit sensitive about it”* (expert A in appendix 7.9). Moreover, she added *“I personally would not have a problem with asking employees to complete this questionnaire but I doubt some would answer it honestly or some management would allow it”* (expert A in appendix 7.8). In contrary, expert C stated that she could re-apply *“... the culture statement questionnaire with no problems at all, as the instructions are very clear to me and also the interviewees would have no problem following it”* (expert C in appendix 7.9). Expert B did not provide a reason for his response. Two out of 3 responses were above the mean, therefore the culture-statement questionnaire can be considered somewhat usable.

The range of the experts’ responses about the culture mining approach was 3-5. Expert C claimed, *“I might have some problems with the culture-mining approach as employees might be scared to answer truthfully to the questions”* (expert C in appendix 7.9). Additionally, expert A stated that *“it would require a lot of time”* (expert A in appendix 7.8). Expert B did not provide a justification for his response. Results about the usability of this stage of the elicitation technique are inconclusive.

A component of the CAREs method is usable if the majority of the experts’ responses about all its stages, was above the mean, 4. Table 7.3 shows the frequency of the responses.

<del>Response</del> Expert	1: not easy	2	3	4	5	6	7: very easy
A	0	0	1	2	0	0	1
B	0	0	0	0	4	0	0
C	0	0	1	0	1	2	0
Total	0	0	2	2	5	2	1

Table 7.3: The frequency of the experts’ responses for all 4 stages of the elicitation technique

The total frequencies of the experts’ responses suggest that the elicitation technique as a whole is somewhat usable. The majority of their responses lay above 4, which is the mean (total of responses above 4, are 8 out of possible 12 and are highlighted in grey). The experts’ responses to the method questionnaire (appendix 7.9) support this result. Expert A stated *“all stages of the elicitation technique seem straight-forward”*. The same with expert B, who claimed that *“it is pretty clear what has to be done and how to do it...”*. Expert C agreed as

well, by saying “*from what I have seen, I consider the elicitation technique very clear and I think I could re-apply it with no problems*”.

- Modelling technique

CAREs modelling technique is divided into 3 stages; identification of cultural elements stage, the modelling stage and the analysis of model fragments stage. Table 7.4 shows the range of the experts’ responses about the usability of each of those 3 stages of the modelling technique:

Modelling technique	Q1a (Identification of cultural elements)	Q1b (Modelling)	Q1c (analysis of model fragments)
Expert A	4	4	4
Expert B	5	6	5
Expert C	6	6	6
Range	4-6	4-6	4-6

Table 7.4: The range of responses about the modelling technique’s usability (Question 1: *With what level of ease do you perceive re-applying the following...?* – 7: very easy and 1: not easy, the rest of the values in-between)

The experts’ responses about the usability of the identification of cultural elements stage were between 4 and 6. According to expert A, this stage “*is time consuming and not all consultants would have the skill set to do this*” (expert A in appendix 7.8). Expert B’s response agrees with expert A’s, the stage is time consuming but “*it can be potentially very profitable*” (expert B, appendix 7.8). Expert C did not justify her/his response. Two out of 3 responses were above the mean, so this stage was considered somewhat usable.

Responses about the usability of the modelling stage ranged from 4 to 6. Expert A allocated a 4 because she thought that, in the same way as the previous stage, “*it is time consuming and not all consultants would have the skill set to do this*” (expert A in appendix 7.8). According to expert B, “*given the high degree of flexibility, especially of the modelling technique*” could easily re-apply it (expert B in appendix 7.9). Expert C did not provide a specific reason for her/his answer. Given the results, the stage was considered somewhat usable.

Responses about the usability of the analysis stage are also between 4 and 6. Again expert A considered this stage time consuming and difficult for all consultants to accomplish (expert A in appendix 7.8). Expert B argued that “*interaction between model fragments is complex but*



it described the cultural elements in a dynamic way, which helps to make sense of the elements as a whole” (expert B in appendix 7.8). Moreover, expert C stated “I think I could re-apply it without any problems, it seems very beneficial, especially the analysis of the models stage” (expert C in appendix 7.9). As 2 out of the 3 responses were above the mean, this stage was considered somewhat usable.

Table 7.5 shows that the modelling technique as a whole is usable.

Response Expert	1: not easy	2	3	4	5	6	7: very easy
A	0	0	0	3	0	0	0
B	0	0	0	0	2	1	0
C	0	0	0	0	0	3	0
Total	0	0	0	3	2	4	0

Table 7.5: The frequency of the experts’ responses for all 3 stages of the modelling technique

The experts’ responses to the method questionnaire support this argument. “I could re-apply it, it would be time consuming but on the other hand beneficial” (expert A). Responses of experts B and C concurred with expert A and added “yes I could given the high flexibility of the modelling technique...conceptually it is very easy to grasp...” (expert B), “I think I could re-apply it without any problems, it seems very beneficial” (expert C).

- CULTural Predictions (CUP)

Each of the experts was presented with the process of how to generate Cultural Predictions and examples. The 4 CUP were essentially the same for all 3 experts, apart from the countries mentioned. For expert A, Australia and the UK were chosen. Table 7.6 shows the range of the experts’ responses about the usability of each of the CUP presented to them individually.

Cultural Predictions	Q1a (prediction 1)	Q1b (prediction 2)	Q1c (prediction 3)	Q1d (prediction 4)
Expert A	4	4	4	4
Expert B	5	5	5	5
Expert C	6	6	6	6
Range	4-6	4-6	4-6	4-6

Table 7.6: The range of responses about the CUP usability (Question 1: *With what level of ease do you perceive re-applying the following...?* – 7: very easy and 1: not easy, the rest of the values in-between)

The 3 experts were asked to evaluate the level of ease they perceived when re-applying the 4 CUPs, in terms of repeating the process for generating them. No one prediction was more usable than another. By looking at table 7.6, each of the experts' responses was the same for all 4 CUP because they were asked to evaluate re-applying the process rather than each of the CUP. Hence, in this section, the usability results for the 4 CUP are presented together.

Expert responses about the usability of the CUP ranged between 4 and 6. Expert A stated *“I would be able to reproduce such CUP, however they would require time”* (expert A in appendix 7.9). Expert B claimed *“yes I could re-apply them. If I had completed correctly all the previous phases, applying the CUP wouldn’t be a problem at all”* (expert B in appendix 7.9). Expert C argued *“yes, I could re-apply them because the process seems easy to follow. After you establish the countries you are interested in and the norm that will be violated, it is a matter only of looking at the tables provided”* (expert C in appendix 7.9).

Table 7.7 shows that the cultural predictions are somewhat usable.

Response Expert	1: not easy	2	3	4	5	6	7: very easy
A	0	0	0	4	0	0	0
B	0	0	0	0	4	0	0
C	0	0	0	0	0	4	0
Total	0	0	0	4	4	4	0

Table 7.7: The frequency of the experts' responses for all 4 CUP

### 7.3.3.2 The CAREs components' utility

The perceived utility of all 3 components of the method was evaluated by asking the same question for each of the 3 components of the method. For example,

1. *How useful for ERP implementations did you find the following 4 tools (stages) of the elicitation technique?*
  - Elicitation technique

Table 7.8 shows the range of experts' responses about the utility of each of the 4 stages of the elicitation technique, namely observations, background questionnaire, culture-statement questionnaire and culture mining approach.



Elicitation technique	Q1a (Observations)	Q1b (background questionnaire)	Q1c (culture-statement questionnaire)	Q1d (culture mining approach)
Expert A	7	7	7	7
Expert B	5	6	6	6
Expert C	6	6	5	7
Range	5-7	6-7	5-7	6-7

Table 7.8: The range of responses about the different stages of the elicitation technique's utility.  
(Question 2: "How useful for ERP implementations did you find the following...?" - 7: very useful and 1: not useful, the rest of the values in-between)

From the range of the experts' responses, as shown in table 7.8, it can be claimed that the culture mining approach and the background questions were presented to be more useful than the other 2 stages.

Experts' responses about the utility of the observations technique ranged from 5 to 7. Expert A stated that the observations are an example of *"what good consultants should be looking at"* (expert A in appendix 7.9). Expert B claimed that observations *"give a good overall feeling of an organisation, i.e. social norms, beliefs, way work is organised, general differences between groups, physical layout etc."* (expert B in appendix 7.8). Expert C said that *"I do not find the observations only useful but necessary; from my experience, 80% of projects fail because this kind of methodologies are not used"* (expert C in appendix 7.8). All 3 experts' responses about the observations stage were above the mean. Hence it can be said that this stage was perceived to be useful.

Experts' responses on the background questionnaire were 6 and 7. Expert A she believed that *"the background questionnaire is very useful, as it would indicate what the employees are doing and how this would change because of the ERP implementation. The questionnaire gives you an idea of what and where to look for"* (expert A in appendix 7.9). Expert B stated that *"this is my favourite questionnaire as I think background experience and actual job impacts are key predictors in resistance to change"* (expert B in appendix 7.8). The same expert went further by saying, *"the background questionnaire offers useful information about the computing literacy within the company and what is regarded as good and bad about the implementation"* (expert B in appendix 7.9). Finally, expert C claimed that the background questionnaire is useful because it helps *"to find groups of behaviour which is very important"* (expert C in appendix 7.8). All 3 experts' responses were above the mean, suggested that the background questionnaire was perceived to be useful.



Experts’ responses about the culture-statement questionnaire were from 5 to 7. According to expert A, “... *the culture-statement questionnaire, which is definitely a useful tool for understanding the culture of the organisation that implements an ERP package*” (expert A in appendix 7.9). Expert B added further, “*I especially think that the culture-statement questionnaire is very useful. I can see employees and their management objecting to it as it might give rise to sensitive issues, but perhaps this is exactly why it is useful. It helps to uncover the culture of an organisation*” (expert C in appendix 7.9). Additionally, expert C argued that “*the culture-statement questionnaire is helpful in looking at differences between groups, even within 1 department, not just between departments*” (expert B in appendix 7.9). Responses were above mean, indicating that this stage of the elicitation technique was also perceived to be useful.

Experts’ responses about the usefulness of the culture-statement questionnaire were 6 and 7. Expert A stated that “*the advantage of the elicitation technique as a whole is the culture-mining approach, which basically offers the rationale for everything, that was elicited in the previous phases*” (expert A in appendix 7.9). Expert B agreed with expert A: “*the culture mining approach triangles the previous 3 stages and it finds out why and relates everything together*” (expert B in appendix 7.9). Finally, expert C concurred by claiming “*I feel that the culture mining approach is very useful as it puts everything together that was done I the previous 3 stages*” (expert C in appendic7.9). All 3 experts’ responses were above the mean indicating that the culture mining approach was perceived to be useful.

Table 7.9 shows that the elicitation technique as a whole is useful for ERP implementations.

Response Expert	1: not easy	2	3	4	5	6	7: very easy
A	0	0	0	0	0	0	4
B	0	0	0	0	1	3	0
C	0	0	0	0	1	2	1
Total	0	0	0	0	2	5	5

Table 7.9: The frequency of the experts’ responses for all 4 stages of the elicitation technique

The experts’ responses to the method questionnaire support the argument that the elicitation technique is useful. Expert A claimed that “*the elicitation technique is useful because it formalises what good consultants should do. In detail it formalises everything that should be done and emphasises what good consultants should be looking at*”. Expert B reinforced this



argument by stating *“Yes for sure, because you get their expectations, their differences in culture, the different problems within the different departments. It is a very holistic approach and it covers the important things in ERP implementations. Moreover, it structures the implementation team as well”*. Finally, expert C went further by saying *“I did find them very useful as they provide an insight into the organisation that is implementing the ERP that I wouldn’t have otherwise. As a consultant you have the opportunity of learning things about your client, like their mentality, habits etc, which can help you adjust your way of working to theirs, which could facilitate the whole implementation process. This is why this technique is useful”*.

- Modelling technique

The CAREs modelling technique is divided into 3 stages; identification of cultural elements, modelling, and analysis of the model fragments. Table 7.10 presents the experts’ responses about the utility of each of those 3 stages of the modelling technique.

Modelling technique	Q1a (Identification of cultural elements)	Q1b (Modelling)	Q1c (analysis of model fragments)
Expert A	7	7	7
Expert B	5	6	5
Expert C	5	6	6
Range	5-7	6-7	5-7

Table 7.10: The range of responses about the different stages of the modelling technique’s utility.  
 (Question 2: *“How useful for ERP implementations did you find the following...?”* - 7: very useful and 1: not useful, the rest of the values in-between)

Experts’ responses about the utility of the identification of cultural elements stage ranged between 5 and 7. Expert A believed this stage was very useful, stating *“especially the identification of the cultural elements, which although is an essential and useful stage, in order to identify them, you need to have a good understanding of them. Still this stage is a prerequisite for the other 2, and the whole of the modelling technique seems very useful, so that stage is very useful as well”* (expert A in appendix 7.9). Expert B stated that *“I am only concerned about the scale of the elements that may be identified through the 1<sup>st</sup> stage”* (expert B in appendix 7.9). He added further, *“for ERP implementations, the scope is generally large (high number of users) so the data collection and analysis would be time consuming”* (expert B in appendix 7.8). All 3 experts’ responses were above the mean, indicating that this tage was perceived to be useful.

Responses about the utility of the modelling stage were 6 and 7. Expert A believed that this stage was very useful: *“I especially like the modelling stage because it organises the data in small model fragments which is very useful”* (expert A in appendix 7.0). Expert B reinforces this point by claiming *“I think that the modelling stage is very useful as it is a very effective way of describing relationships between cultural elements”* (expert B in appendix 7.9). Expert C did not provide an explanation for her response. All three experts were above the mean, indicating that the stage was perceived to be useful.

The final stage assessed by the experts was analysis of model fragments. Responses ranged from 5 to 7. Expert C stated *“I find especially useful the analysis stage as it gives rise to the problems that might appear. I can also apply to this stage other techniques as well”* (expert C in appendix 7.9). Expert B was more concerned because *“it could be very complex for large number of stakeholders. The analysis could take time and many organisations are very impatient and look for ‘quick fixes’”* (expert B in appendix 7.8). Expert A did not provide a justification for her answer. All responses were above the mean, indicating that this stage was perceived to be useful.

Table 7.11 illustrates that the modelling technique as a whole is useful for ERP implementations.

Response Expert	1: not easy	2	3	4	5	6	7: very easy
A	0	0	0	0	0	0	3
B	0	0	0	0	2	1	0
C	0	0	0	0	1	2	0
Total	0	0	0	0	3	3	3

Table 7.11: The frequency of the experts’ responses for all 3 stages of the modelling technique

The experts’ answers to the method questionnaire support this claim. *“I did because it is a good way of organising the information from the previous phase... it helps identify possible ERP implementation issues”*. Additionally, *“it is a thorough and holistic approach”* it is useful *“in solving culture-related problems or at least know how to deal with them”* (expert B). Expert C agreed with the other 2 experts and stated that it is useful because *“it helps discover potential issues but also provides an explanation behind them. Hence a consultant will know where to look in order to address those issues”*.



- Cultural Predictions

Table 7.12 shows experts’ responses about the perceived utility of each of the 4 CUP (please see appendix 7.8 for the 12 CUP presented to the 3 experts).

Cultural Predictions	Q1a (prediction 1)	Q1b (prediction 2)	Q1c (prediction 3)	Q1d (prediction 4)
Expert A	6	6	6	6
Expert B	5	5	5	5
Expert C	6	6	6	6
Range	5-6	5-6	5-6	5-6

Table 7.12: The range of responses about the CUP utility. (Question 2: *“How useful for ERP implementations did you find the following...?”* - 7: very useful and 1: not useful, the rest of the values in-between)

The 3 experts were asked to evaluate the level of usefulness of CAREs when generating the CUP. Therefore, in this context, there is no one prediction that is more useful than another, as they are the outcome from following the same process. By looking at table 7.12, each of the experts’ responses was the same for all 4 CUP because they were asked to evaluate the usefulness of the process for ERP implementations, rather than to distinguish between individual CUP.

Responses about the usefulness of the CUP for ERP implementations were 5 and 6. Expert A claimed that *“as a generic indicator, they are definitely useful... they would help in interpreting and explaining things. Also, it would help when international teams are working together. For example in global teams”* (expert A in appendix 7.9). Expert B stated that *“they are very useful, as the consultants will know what the impact will be if they change something in a specific culture and even if they do, what the reaction will be and hence how to deal with it... They are useful not just for ERP implementations but for anything that involves interaction or dealing with different cultures”*. Expert C argued that *“they are very useful, especially for a consultant that has no prior experience in a country he or she will be working in”*. She then said, *“they would help avoid certain problems. And even if the decisions is to go ahead, at least as a consultant you have an indication of what to expect, where and from whom in a way. This can make a project so much easier and transparent in a way, as the problems and potential issues would be out in the open”*.

Table 7.13 shows that the process for generating all CUP is considered as useful for ERP implementations.

Response Expert	1: not easy	2	3	4	5	6	7: very easy
A	0	0	0	0	0	4	0
B	0	0	0	0	4	0	0
C	0	0	0	0	0	4	0
Total	0	0	0	0	4	8	0

Table 7.13: The frequency of the experts' responses for all 4 CUP

### 7.3.3.3 The CAREs components' effectiveness

The effectiveness of all 3 components of the CAREs method was tested through the 3<sup>rd</sup> question of the evaluation questionnaire (appendix 7.4), including questions such as:

2. *Do you find that the results for scenario 1 from the following 4 tools (stages) of the elicitation technique meet the promises?*

See appendices 7.8 and 7.9 for the experts' responses. No expert provided explanation for their responses, hence the lack of expert quotes.

#### - Elicitation technique

Table 7.14 reports experts' responses about the effectiveness of each of the 4 stages of the elicitation technique, namely observations, background questionnaire, culture-statement questionnaire and culture mining approach.

Elicitation technique	Q1a (Observations)	Q1b (background questionnaire)	Q1c (culture-statement questionnaire)	Q1d (culture mining approach)
Expert A	7	7	7	7
Expert B	6	6	6	6
Expert C	5	6	4	7
Range	5-7	6-7	4-7	6-7

Table 7.14: The range of responses about the different stages of the elicitation technique's effectiveness. (Question 3: "Do you feel that the results for scenario 1 from the following tools [stages] meet the promises?" - 7: yes and 1: no, the rest of the values in-between)



As seen from table 7.14, all stages of the elicitation technique were perceived to be effective and from table 7.15 that the technique as a whole was perceived to be effective for ERP implementations.

Response Expert	1: not easy	2	3	4	5	6	7: very easy
A	0	0	0	0	0	0	4
B	0	0	0	0	0	4	0
C	0	0	0	1	1	1	1
Total	0	0	0	1	1	5	5

Table 7.15: The frequency of the experts' responses for all 4 stages of the elicitation technique

The experts' responses to the method questionnaire support the argument that the elicitation technique is useful. Expert A claimed *"I think it was very effective. The data collected just for scenario 1 show its potential"*. Expert B agreed and added further *"I personally think it was effective. All the 4 stages work together towards understanding a situation like the one described in scenario 1"*. Expert C just agreed with the other 2 experts by saying, *"I think the technique was very effective for the example used in the scenario"*.

#### - Modelling technique

Table 7.16 shows that the experts responses about the effectiveness of the modelling stages.

Modelling technique	Q1a (Identification of cultural elements)	Q1b (Modelling)	Q1c (analysis of model fragments)
Expert A	7	7	7
Expert B	6	6	6
Expert C	5	6	6
Range	5-7	6-7	6-7

Table 7.16 The range of responses about the different stages of the modelling technique's effectiveness. (Question 3: *"Do you feel that the results for scenario 1 from the following tools (stages) meet the promises?"* - 7: yes and 1: no, the rest of the values in-between)

All experts perceived all stages of the modelling technique to be effective and as shown in table 7.17, the modelling technique as a whole as well.

Response Expert	1: not easy	2	3	4	5	6	7: very easy
A	0	0	0	0	0	0	3
B	0	0	0	0	0	3	0
C	0	0	0	0	1	2	0
Total	0	0	0	0	1	5	3

Table 7.17: The frequency of the experts’ responses for all 3 stages of the modelling technique

The experts’ answers to the method questionnaire support this claim. *“Yes. I thought it was very effective. It described the information of scenario 2 in a very clear model”* (expert A). Expert B agreed by stating *“It definitely was effective. It captured in the model all the necessary information.”*.

- Cultural Predictions

Table 7.18 shows the range of the experts’ responses about the effectiveness of each of the 4 CUP.

Cultural Predictions	Q1a (prediction 1)	Q1b (prediction 2)	Q1c (prediction 3)	Q1d (prediction 4)
Expert A	6	6	6	6
Expert B	5	5	5	5
Expert C	6	6	6	6
Range	5-6	5-6	5-6	5-6

Table 7.18 The range of responses about the CUP effectiveness. (Question 3: *“Do you feel that the results for scenario1 from the following tools (stages) meet the promises?”* - 7: yes and 1: no, the rest of the values in-between)

Table 7.19 shows that the process for generating CUP was perceived to be effective as a whole.

Response Expert	1: not easy	2	3	4	5	6	7: very easy
A	0	0	0	0	0	4	0
B	0	0	0	0	4	0	0
C	0	0	0	0	0	4	0
Total	0	0	0	0	4	8	0

Table 7.19: The frequency of the experts’ responses for all 4 CUP



The experts' answers to the method questionnaire support this claim. Expert A stated *"I think that the process is effective. The 4 CUP used as an example seem realistic to me based on my experience in the countries mentioned"*. Additionally, expert B stated *"The process seems effective to me as the 4 predictions seem correct"*.

## 7.4 Experts' advice on the CAREs method

The 3 experts also provided advice to improve CAREs:

- Time is an important factor. All 3 experts argued that time is very scarce in ERP implementations and that the method seems to require a fair amount of time to apply. According to expert C *"it seems time-consuming but very valuable"*. However, the method has the potential to save time over the project by predicting and avoiding problems in future ERP implementations.
- Sensitivity is another factor. Eliciting and understanding culture requires an in depth analysis of the organisation in interest. According to expert A *"I am a bit worried as the clients might be a bit sensitive about the culture-statement questionnaire"*. Expert A believed that employees might refuse to answer to the questionnaire or not answer truthfully.
- Complexity is a third factor. According to expert B, the larger the size of the company, the more complex the data to be elicited and analysed will be. This expert believes that the method will be more useful for smaller scale ERP implementations.

One CAREs solution to handle the time and complexity factors is to automate certain stages of the method such as the modelling technique. Sensitivity problems can be handled by guaranteeing anonymity of the interviewees' responses to the culture-statement questionnaire. The final chapter discusses this future work in more depth.

## 7.5 Summary and chapter conclusions

This chapter presented the results of an expert evaluation of the CAREs method to determine its effectiveness, utility, and usability of the 3 components of the method.

The studies provided evidence with which to test hypothesis five (H5):

**H5** The CAREs method can provide utility in ERP implementation projects to identify, explain and predicting culture-related implementation problems.

In order to investigate hypothesis five (H5), I decomposed it further into 3 sub-hypotheses, which reflect the 3 parts of the CAREs method. I tested each part of

- H5.1** The culture elicitation technique (component A of the CAREs method) is usable, utilisable and effective in **identifying** useful information about potential culture-related problems.
- H5.2** The modelling technique (component B of the CAREs method) is usable, utilisable and effective in **explaining** culture-related problems.
- H5.3** The cultural predictions (component C of the CAREs method) are usable, utilisable and effective in **predicting** the extent of the culture-related problems arising in organisations of different cultures.

Utility defines the usefulness that the 3 components of the CAREs method can provide to ERP implementation teams in identifying, explaining and predicting culture-related implementation problems. I argue that for the components for the method to be of utility to ERP implementation teams, they also have to be usable (ease of use) and effective (successful).

Two sub-objectives that were set in order to enable me to test this hypothesis, which were:

1. To conduct evaluation studies in order to determine the level of usability, utility and effectiveness of each of the 3 components of CAREs
2. To supply enough evidence to suggest that the method can provide some utility in ERP implementations.

Results provided evidence to support each of these sub-objectives of hypothesis five (H5). Moreover, evidence was found to support this hypothesis. The results from the evaluation studies reported in chapter 7 revealed that the CAREs method could offer more than what the 3 experts suggested. Additionally evidence was found to support each of the three sub-hypotheses of H5. The culture elicitation technique (component A of the CAREs method) was found to be utilisable, effective and rather usable in identifying useful information about potential culture-related problems. Also, the modelling technique (component B of the



CAREs method) was found to be useful, effective and somewhat usable in explaining culture-related problems. Finally, it was found that the cultural predictions (component C of the CAREs method) are utilisable, effective and somewhat usable in predicting the extent of the culture-related problems arising in organisations of different cultures. Therefore, it can also be said that enough evidence to accept hypothesis five (H5) was found.

# Chapter 8

## Discussion and Conclusions

This chapter summarises the thesis research and concludes with a discussion of possible future directions



# Chapter 8

## Discussion and Conclusions

### 8.1 Introduction

This chapter summarises the work reported in this thesis and the benefits of the CAREs method for implementing an ERP system in different national and organisational cultures. It also presents contributions of the reported research and future work.

### 8.2 Summary

The work was driven by 5 research hypotheses that are reviewed as follows.

#### 8.2.1 Hypothesis one (H1)

Hypothesis one (H1) stated that *“organisational and national cultures have a critical impact on the efficiency of ERP implementations”*. I defined impact in this context, the negative effect or impetus an element of culture might have on the efficiency of an ERP implementation, which could give rise to culture-related problems. These culture-related problems are as critical for the efficiency of ERP implementations as other types of problems customer organisations face.

This hypothesis was investigated through empirical studies. The first study was reported in chapter 4 and the second in chapter 5. The first study served as a preliminary test for hypothesis one and was carried out at the finance department of a higher educational establishment that implemented SAP R/3. Seven problems were elicited, three of which were found to be influenced by the culture of the finance department. The 3 culture-related problems were found to be as critical as the other types of problems the finance department faced.

The second study was undertaken at a large multi-national European supplier of pharmaceuticals and laboratory equipment. The company implemented SAP R/3 throughout

its national subsidiaries. Implementation problems were identified, eleven of which were found to be influenced by the national and organisational culture of the subsidiaries. Seven culture-related problems were identified in the Scandinavian subsidiary and four at the UK subsidiary. No culture-related problems were elicited at the German subsidiary. The 11 culture-related problems were found to be as critical as the other types of problems faced by the other 2 subsidiaries.

All sub-objectives related to hypothesis one (H1) were achieved and evidence to support hypothesis one gathered. Results showed that organisational and national culture do have an impact on ERP implementations. Furthermore, instantiations of the meta-schema were produced for each problem to reveal evidence that the reported problems arose because of the violation of a certain cultural element. Moreover, it can be argued that each of the eleven culture-related problems are as important as the other types of problems faced, because it affected the agents' performance on the R/3 and the subsidiary as a whole. However, there is no evidence to suggest that the culture-related problems are more important than the other types of problems faced by the subsidiaries.

### 8.2.2 Hypothesis two (H2)

Hypothesis two (H2) stated that *“social and management science theories and models can be integrated and progressed to develop a descriptive model (meta-schema) of some of the key elements of national and organisational culture that are critical to ERP implementations”*.

Chapter 3 reported the integration of theories of culture from the social and management science with theories from computer science to produce the meta-schema of culture, a descriptive model of the critical elements of organisational and national culture for ERP implementations. The meta-schema of culture was modelled using UML (Unified Modelling Language) notation, which allows the creation of instantiations of the schema that include the chosen key elements of culture for ERP implementations.

This hypothesis was investigated through the studies reported in chapters 4 and 5. The first study was conducted at the finance department of a higher educational establishment that implemented SAP R/3. It was carried out as a preliminary test of hypothesis two. Three instantiations of the meta-schema were developed, all of which demonstrated the impact culture has on the efficiency of the SAP implementation at the finance department. Each of the 3 instantiations described how the element of culture 'norm' was violated through the execution of an action as a result of the SAP implementation. Hence, this violation of a norm



gave rise to a culture-related problem. The element 'norm' was found to be critical to the SAP implementation at the finance department.

The second study was conducted at 3 of the subsidiaries of a multi-national European supplier of pharmaceuticals and laboratory equipment that implemented SAP R/3. Seven instantiations of the meta-schema were developed for the Scandinavian subsidiary and four for the UK one. The German subsidiary did not face any problems, and therefore no instantiations were produced. All eleven instantiations of the other 2 subsidiaries demonstrated once again, the impact their culture had on the efficiency of the SAP implementations. More specifically, each of the instantiations described how an agent's norm was violated by performing a certain action because of the implementation of the SAP system. Hence, this violation of a norm gave rise to a culture-related problem. The element norm was found to be critical once again for the SAP implementations at the Scandinavian and the UK subsidiaries.

The sub-objective of hypothesis two (H2) was met and evidence was elicited to test hypothesis two (H2). From the findings of the studies reported in chapter 4 and 5, it can be argued that evidence was found to support hypothesis two. Instantiations of the meta-schema were developed that described the key elements of national and organisational culture which were critical to the ERP implementations. The instantiations incorporated elements of culture that were critical for ERP implementations because the violation of norms gave rise to the identified culture-related problems.

### 8.2.3 Hypotheses three (H3) and four (H4)

Hypothesis three (H3) stated *"social and management science theories can be extended to produce models that accurately describe the culture-related problems observed in current ERP implementations"*. In this context, the models accurately describe a culture-related problem when the elements they incorporate are correctly labelled from the interview data.

Hypothesis four (H4) stated *"social and management science theories can be extended to produce models that can be applied to explain the reasons behind the culture-related problems arising from ERP implementations"*. In this context, the models explain a culture-related problem when the elements they incorporate can be used to describe the reason for the existence of these problems.

Hypotheses three (H3) and four (H4) claim that the models (instantiations) produced by instantiating the meta-schema using the interview data can accurately describe and explain the culture-related problems that arise from ERP implementations.

By following the data gathering and analysis method, a large repository of data was elicited and analysed from the three studies. An instantiation was developed for each of the 11 culture-related problems that were identified. Each of the 11 instantiations offered a representation of the eleven culture-related problems by showing the elements of culture associated with each of those problems. Every one of the elements was described by labelling the quotes from the interviewees' responses accurately.

Furthermore, the instantiations also indicated possible reasons for the existence of the eleven culture-related problems. In each of the eleven instantiations, the element 'norm' was found to offer the explanation behind the culture-related problems because it was the expectation the agent had that the ERP system did not meet. The fact that the agent's expectation, which is a norm for a specific subsidiary, was not met is the reason for each of the culture-related problems.

From the results, evidence was found to support these 2 hypotheses. The results from the studies reported in chapter 5 demonstrate that the produced instantiations of the meta-schema were able to accurately represent (H3) and be applied to explain (H4) the culture-related problems arising from ERP implementations.

#### 8.2.4 Hypothesis five (H5)

The final hypothesis of the thesis was *"the CAREs method can provide utility in ERP implementations to identify, explain and predict culture-related implementation problems"*.

Utility defines the usefulness that the 3 components of the CAREs method can provide to ERP implementation teams in identifying, explaining and predicting culture-related implementation problems. I argue that for the components of the method to be of utility to ERP implementation teams, they also have to be usable (easy of use) and effective (successful).

Results showed that the method offers more than what the 3 experts suggested from their experience. The results from the evaluation and method questionnaire (phase 5 and 6) were analysed and the level of usability, utility and effectiveness of each of CAREs component was



determined, according to the assessment by the three experts. It was found that 2 out of the 3 experts felt that all 3 components of the method were usable (ease of use). Moreover, it was found that all 3 experts believed that the 3 components of the method were of utility (useful). Finally, it was also discovered that the 3 components were effective (successful) for the 3 scenarios. Those results provided evidence to support hypothesis five (H5).

## 8.3 Contributions of the research

The research reported in this thesis has a number of implications for research into ERP implementations as well as for inter-disciplinary research.

### 8.3.1 ERP implementations

The contributions of this thesis to ERP implementation methods are discussed in this section.

#### 8.3.1.1 A theory of the impact of national and organisational cultures on ERP implementations

As demonstrated in the chapter 2 of this thesis, Information and ERP Systems theories and models do not incorporate cultural elements and characteristics. In the same way, social and management science theories, or theories of culture, do not deal with Information Systems and ERP Systems (ERP & IS). In chapter 3 of this thesis, I presented a new theory that includes:

- ◆ A generic definition of culture, which is not specific to ERP implementations and can therefore be used in any context. The definition is generic in the sense that it applies to both national and organisational culture.
- ◆ A generic model of culture, which illustrates what culture is and its relation to ERP/IS implementations. This model integrates the available models of culture and extends them by incorporating concepts from computer science and ERP theories. The generic model of culture is applicable when researching the impact of culture on any type of IS implementation. In addition, the model reveals the level of implicitness of all the elements it

incorporates simultaneously. This is useful when trying to elicit evidence of each of those elements.

- ◆ A meta-schema of culture for ERP implementations. It is a descriptive model of the key elements of national and organisational culture and of the critical elements and concepts of business process models. The meta-schema of culture also demonstrates the inter-relationships between the different elements. The meta-schema of culture can be useful when trying to understand the influence of culture on any type of IS implementations, as it can illustrate the relationships between the key elements of a culture and the key concepts of IS implementations. The relationships between those elements can help identify potential culture-related issues that may arise as a result of an IS implementation.

#### 8.3.1.2 A method for implementing ERP systems in different national and organisational cultures, called CAREs (Culturally Aware Realisation of ERP Systems)

It is a theoretically-grounded method that supports an implementation team to identify, explain and predict possible culture-related problems in ERP implementations. It is comprised of 3 components:

- ◆ The culture-elicitation technique for identifying useful information about potential-culture-related problems. The technique elicits evidence about the national and organisational culture of a company as well as about the ERP implementation that will take place. It can also be useful when a person aims to elicit information about the culture of a company that will implement an IS system.
- ◆ The modelling technique for describing and explaining potential culture-related problems. The technique enables the creation of model fragments that illustrate and describe the potential culture-related problems that may arise during an ERP implementation. This technique can be used for modelling the potential culture-related problems that may arise in an IS implementation.



- ♦ The Cultural Predictions for predicting the extent of the potential culture-related problems that may arise as a result of an IS implementations, in organisations in different national cultures.

The theory of culture for ERP implementations and the CAREs method presented in chapters 3 and 6 respectively were developed to improve the implementation of ERP systems in different national and organisational cultures. Since then, the demand is still strong as more companies implement such systems while the ones that already have, update their existing ones. Nowadays, ERP systems have been extended by providing additional capabilities, including e-business and customer relationship management (CRM) solutions. Nevertheless, the theory and the CAREs method of this thesis can be used to realise the impact culture might have on the efficiency of the implementation of the additional features and capabilities of the ERP systems.

### **8.3.2 Interdisciplinary research**

This research also has positive implications for inter-disciplinary research. It demonstrated that cross-curricular research is possible and beneficial to the computer science discipline. For example, the CAREs method can be adapted to analyse the impact of culture in other areas of software development such as team building within the different cultures of development in different geographic locations in a global software development company.

## **8.4 Future work**

The research of this thesis addressed the problem of culture-related problems arising when implementing ERP systems in different national and organisational cultures. This section describes future work to further the theory of culture for ERP implementations and the CAREs method.

### **8.4.1 Future work on the theory of culture for ERP implementations**

The theory reported in chapter 3 deliberately excluded certain features of social and management science theories. Nevertheless future research into the following areas would be useful and interesting.

It would be valuable to examine the personality of agents whose norms may be potentially violated by an ERP implementation. Revealing the personality of those agents could provide important information on how to communicate and handle the changes to the business processes that could give rise to the violation of those agent's norms.

Another aspect that could be examined is the effect and influence of leader (e.g. founder, or top management) of the customer organisation on ERP implementations. There is evidence to support the argument that the leader of an organisation might influence the success of an ERP implementation. Schein (1983) asserts that: *"founders usually have a major impact on how the group defines and solves external problems of surviving and growing, and how it will internally organise itself and integrate its own efforts"*. The commitment and support of the top management or the leader is one of the most important factors affecting ERP implementations (Shanks et al. 2000, Somers & Nelson 2001, Bancroft 1996, Holland et al. 1999). According to McKersie & Walton (1991), the role and responsibilities of the top management should comprise an understanding of the limitation and possibilities of IT, the establishment of reasonable goals for the IT system, manifestation of strong commitment to the successful introduction of IT and the communication of the IT strategy to all employees or groups of professionals within an organisation can develop their own sub culture (Schein 1983, Hofstede 1994). Therefore it would be beneficial if the influence of the leader of a culture to the efficiency of an ERP implementation could be researched further. Additionally, it may be very useful to develop a method for the top management to follow in order to increase the potential of an efficient ERP implementation.

Professional and/or departmental cultures were also not examined in this thesis. Future work can be carried out to explore the impact of this level of culture on ERP implementations. Different departments can have an equally critical impact on the efficiency of ERP implementations as national and organisational cultures. The theory of culture presented in chapter 3 can be applied to investigate the impact of this level of culture. Therefore, future work can be carried out to adapt the theory in chapter 3 for professional/departmental cultures and their impact on ERP implementations.

Finally, the theory of culture focused on ERP implementation issues and success factors, with particular emphasis on SAP R/3. So for example, future work can be carried out to test the applicability and power of the theory for other ERP systems, for example ORACLE, JD Edwards, etc.



#### 8.4.2 Future work on the CAREs method

The CAREs method was found to be useful in identifying, explaining and predicting culture-related problems arising in ERP implementations. From the results of the evaluation studies reported in chapter 6, future work can be suggested to improve the method.

From the evaluation studies it was elicited that a part of the CAREs method may be regarded as too sensitive for customer organisations. More specifically, it was found that the culture-statement questionnaire contains statements that may be perceived by certain employees as too sensitive and upfront. Therefore, the culture mining approach, which aims to elicit the explanation behind the employees' responses to the culture-statement questionnaire, may also be regarded as too sensitive. A possible solution would be to extend the culture-statement questionnaire by asking the interviewees to give also the reason for their responses. The anonymity of the employees' responses has to be severely emphasised. Maybe providing a box for the employees to drop their completed culture-statement questionnaire would be one suggestion.

Future work can be carried out to evaluate the CAREs method further in a real-time ERP implementation. All 3 components were found to offer advice to ERP implementation teams and to improve the understanding of ERP implementation as a whole. However, the predictive power of the cultural predictions was not evaluated. National cultures evolve and it would be valuable to conduct studies in order to test the strength of the predictions as they are based on Hofstede's work, which was conducted in the 1970s. Future work in evaluating the CAREs method further could offer important feedback on how to strengthen or improve it.

Although the above limitations exist, the thesis is one of the first research projects directed at the impact of national and organisational culture on ERP implementations, and therefore it has made an initial attempt at addressing the problem area. Many of the limitations reflect the fact that the research and its evaluation were constrained by what was realistically possible and practical to model and evaluate. However, further work can be carried out to improve and extend on the research.

So, in recapitulation, this research provides useful early contributions to research on ERP systems and their implementation in different national and organisational cultures. It is hoped that the work of this thesis can be a useful basis for future work in this area and it is sincerely is hoped that the research will encourage this.





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