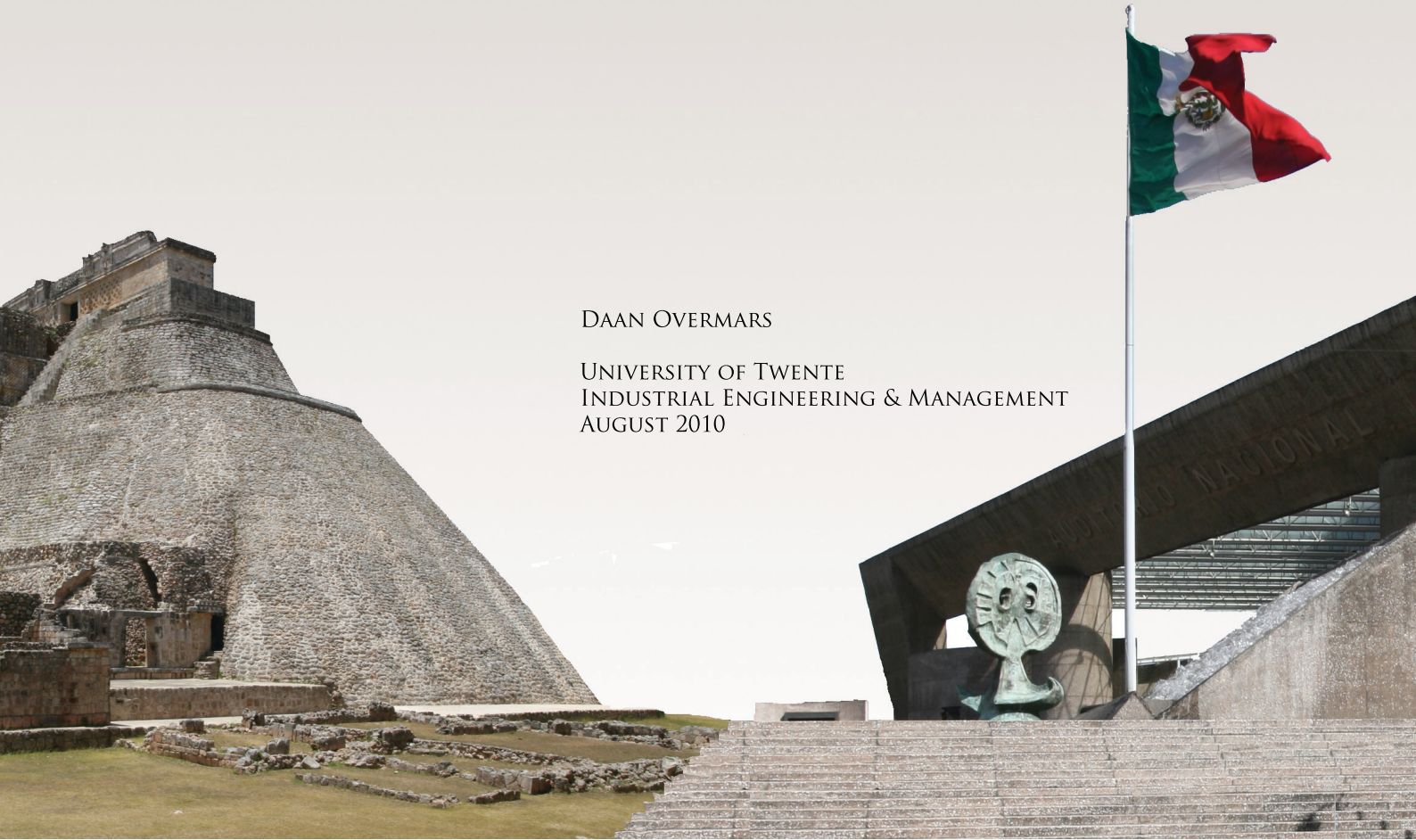
Ex-Post ERP Evaluation at an SME Trading Company in Mexico City

Master Thesis



Daan Overmars

University of Twente
Industrial Engineering & Management
August 2010

Ex-Post ERP Evaluation at an SME Trading Company in Mexico City

Master Thesis
Industrial Engineering & Management

Daan Overmars
University of Twente
School of Management and Government
Department Information Science & Change Management
August 2010

Management Summary

TradCo (TC) is specialized in trading promotional items in Mexico. These items are sourced in Asia en marketed in Mexico. In the last years TC grew with double digit numbers, but the IT infrastructure of the company did not grow with it. The current enterprise resource planning (ERP) system of TC is not sufficient to support the organization. The current system does not have real-time management reports, no support for multiple business units & warehouses and no possibility to include an e-Commerce application at the current ERP system.

TradCo started the implementation of a new ERP system in June 2007. This implementation proceeded not as expected with as result a delay in the implementation. When the delay became almost more than half a year an external evaluation of the ERP implementation was started. This report is the result of this evaluation. The main problem statement of this report is: *"To which extent is the ERP implementation at TradCo successful?"*

Answering this question is possible when there is an evaluation model for an ERP implementation at small and medium enterprise (SME) in Latin America available. There was no model found that meet these requirements. Therefore a new model is developed to evaluate an ERP implementation at an SME in Latin America, namely ex-post ERP Evaluation Model for SME's in Latin America (eEEMSLA).

EEEMSLA is a matrix model with on the vertical axis the parts: Process, Content and Context (Devos & Buelens, 2003) and on the horizontal side four chronological phases. The chronological phases are from the Enterprise System Experience Cycle (Markus & Tanis, 2000). Every phase contains a process, content and context part. The first phase, Chartering Phase, starts at the initiation of the project and goes over into the second phase when the system selection has been made and presented. The second phase, The Project, runs till the system goes live. The third phase, Shakedown, goes over in the fourth phase, Onward & Upward, when the system is used as business as usual. The fourth phase does never end, only when the system is not used anymore or replaced. EEMSLA is used to evaluate the ERP implementation at TC in chronological order, along the four phases.

The necessary data for the evaluation is collected in two periods. In the first period, between February 2008 and June 2008, observations, interviews and document reviews are carried out. In December 2009 a survey is executed to gather data from the period after the going live data (January 2009). The collection of data from these four sources is used to evaluate the ERP implementation at TC with eEEMSLA.

The analysis of the data resulted in positive, neutral and negative elements for every square of the matrix. Putting all these elements together in the model with a color code for being positive, neutral or negative result in a good overview of the parts which went well en the parts which were negative evaluated, see figure 7.

The first phase of the implementation is minimal executed, which resulted in a system choice that is not completely grounded on the normal ERP selection procedures. TradCo chose a custom build ERP system, because it is cheaper, fits better to the organization and is from a known provider. In the second phase the process is not controlled well by the implementation team, knowledge was insufficient and deadlines were violated, which results in a final delay of a year. The new custom build ERP system functions well, this means that the content of the second phase is finally well received. In the third phase the process is still not under control, one year after the going live date people still have problems with the new procedures. Management is satisfied with the result, since the system satisfies all requirements of management. The employees are less satisfied, since their wishes were not added to the requirements and are thus not realized. The overall evaluation analysis of eEEMSLA resulted in the answer that the implementation failed. The final conclusion, based on the opinion of management, employees and eEEMSLA, is that the implementation failed.

Preface

To finish the study Industrial Engineering and Management every student has to write a thesis about a subject which is in the area of the specialisation. In my case it is in the area of Information Science. After a couple of extra years, which enriched my education with foreign experiences and organisational skills, this is the final report to my study.

In the early stages of my thesis I wanted to include a period in Latin America to enrich my thesis with some cultural influences. I found a spot at Tierra del Fuego, the most southern point of South America. Unfortunately the project couldn't start before the project funds were set. I searched further and found in a complete different region a very interesting assignment, namely an ex-post ERP evaluation in Mexico City at TradCo.

This thesis was never successfully finished without the support of my four supervisors, Dr. Ir. C. Katsma, Ir. R. Koolen and M.R. Stienstra MSc. who replaced Ir. S. Maathuis who stopped working at the School of Management and Government. Besides their help and patience I would like to thank everybody who helped me during the writing of this thesis.

Finally I hope that the results of thesis will help TradCo with future implementations of ERP systems or IS systems in general.

Enschede, August 23th 2010

Content

1. Introduction 7
2. Research plan 8
2.1. Introduction 8
2.2. Background 8
2.3. Problem statement 9
2.4. Research questions 9
2.5. Research design 10
2.5.1. Method 11
2.5.2. Boundaries of research 11
3. Theoretical Foundation 12
3.1. Introduction 12
3.2. Evaluations in general 12
3.2.1. usability of evaluations 12
3.2.2. Evaluation Theory 13
3.3. The Process 15
3.3.1. Critical Success Factors of the process 16
3.3.2. Analysis and Summary 17
3.4. The Content 17
3.4.1. Phase 1: Project Chartering 17
3.4.2. Phase 2: The Project 18
3.4.3. Phase 3: Shakedown 18
3.4.4. Phase 4: Onward and Upward 19
3.4.5. Analysis and Summary 20
3.5. The Context 21
3.5.1. Small and Medium Enterprise (SME) 21
3.5.2. Cultural aspects in Mexico Important for ERP implementations 22
3.5.3. Analysis and summary 26
3.6. **e**x-post **E**RP **E**valuation **M**odel for **S**ME's in **L**atin **A**merica 27
4. Research Methodology and Data Collection for TC 31
4.1. Introduction 31
4.2. Applicability of model 31
4.3. Data Collection 32
4.3.1. Phase 1: Project Chartering 34
4.3.2. Phase 2: The Project 36
4.3.3. Phase 3: Shakedown 38

4.4. Method of Analysis 39
5. Case study 41
5.1. Introduction 41
5.2. Company description 41
5.2.1. Activities 41
5.2.2. Mission and vision 41
5.2.3. Company structure 42
5.2.4. Facts, Figures and History 42
5.3. Empirical data 43
5.3.1. Documents 43
5.3.2. Observation 44
5.3.3. Interviews 46
5.3.4. Survey 48
5.4. Analysis 48
5.4.1. Phase 1: Project Chartering 49
5.4.2. Phase 2: The Project 51
5.4.3. Phase 3: Shakedown 53
5.5. Conclusion Overall analysis 55
6. Conclusion 58
7. List of figures and tables 61
7.1. Figures 61
7.2. Tables 61
8. References 62
9. Appendix A: eEEMSLA survey at TC 65

1. INTRODUCTION

For some people abbreviations as SME, ERP, CSF, TC and eEEMSLA are logical, but not for everybody. Therefore these topics will be explained. With this explanation the outline of this report will get clear. In most countries small and medium sized enterprises make a large part of the whole market. In some countries the importance of these companies is larger than in others. But in general companies with a maximum 250 employees belong to this group. This group is therefore also referred to as **S**mall and **M**edium **E**nterprise (SME) (Ayyagari, Beck, & Demirgüç-Kunt, 2003).

As these companies often have not that many resources to buy the newest software they are mostly working with simple business software. Especially in less developed countries the use of special software is rare at SME's. Large companies are mostly using software which can generate real-time reports and have all departments and business processes included/supported in one software system. These kinds of systems are **E**nterprise **R**esource **P**lanning (ERP) systems (Fui-Hoon Nah, Lee-shang Lau, & Kuang, 2001). For SME's these systems are often too expensive or not necessary. But there is a growing number of SME's which is looking at the possibilities of using an ERP system. In western countries this trend is since several years on going, but in developing countries it is not regular to use an ERP system as being an SME (Huang & Palvia, 2001).

To implement an ERP system in an organization one might think that the installation of a CD will be sufficient. But often the business processes needs to be adjusted to fit with the system and the parameters of the system needs to be configured. When thinking about this it becomes a more complex task which can easily go wrong or (partially) fail. To overcome an ERP installation failure there are list with important elements for implementing an ERP system. These are called **C**ritical **S**uccess **F**actors (CSF's) When these are well interpreted and used the changes on a failure will decrease.

The question is why is this all explained? And what does TC mean? TC stands for **T**rad**C**o, a pseudonym for the real company, an SME trading company. TC is growing rapidly, but the current ERP system is not able to support the current business size anymore. Therefore TC needs a new ERP system. In January 2007 TC started a search for a new system, in June 2007 an ERP system provider was found and the system should be finished at the end of 2007. When the system is much delayed in December 2007 the general project leader decided to start an external evaluation of the system. This report is the result of this evaluation.

To execute such an evaluation a model is needed to evaluate the system. These models are available for western and Asian countries. But even for these countries there is not a big choice (Botta-Genoulaz, Millet, & Grabot, 2005). When searching a model for an SME in a Latin American country no models are found. To proceed with the evaluation a model has been build. This development of a matrix model with 4 chronological phases and on the other axis three parts, process, content and context, resulted in the **e**x-post **E**RP **E**valuation **M**odel for **S**ME's in **L**atin **A**merica (eEEMSLA). The development of this model is described in this report.

EEMSLA is used for the evaluation of the ERP implementation at TC in Mexico City. Therefore during the period from February 2008 till June 2008 data has been gathered by means of observations, interviews and document reviews. In December 2009 a survey has been hold to acquire data about the situation after the system went live, January 2009.

All this data is used as input for eEEMSLA to come to an evaluation result, which is that the ERP implementation has failed. The underlying results are not as black-and-white as the word "failed" insinuate. Even a working system can be described as failed….

2. RESEARCH PLAN

2.1. INTRODUCTION

ERP system implementations are not new anymore. But more and more companies realise that an ERP system is never finished (Bedel & Floyd, 2006). The implementation might be finished after the consultants and programmers are gone, but an ERP system needs to be maintained and constantly be adjusted to the changing demands of the organisation since business process are changing too (Fui-Hoon Nah, Lee-shang Lau, & Kuang, 2001).

This process of continuous adjustment starts with or after an evaluation of the implementation, which is called an ex-post evaluation. Sometimes during the implementation there are evaluations to see if the implementation is on the right track. After these evaluations are finished and the results are available the phase of continuous adjustment can start. The evaluation results are a starting point for the continuous adjustments (Govindaraju, 2002).

In recent years the popularity of ex-post evaluations is growing, companies are more and more interested in the continuous improvement of their ERP system and therefore evaluations are necessary (Botta-Genoulaz, Millet, & Grabot, 2005). Ex-post evaluations are evaluations which are executed after the system has been implemented. The opposite of an ex-post evaluation is an ex-ante evaluation which is executed before the system is implemented. In ex-ante evaluation the market is scanned for relevant possibilities.

But what is important for such evaluations and how to carry them out? These are difficult questions in Western countries, but when looking at a market situation in Latin America it's even harder. There are no models available for Latin American companies and if something is written about it, it is for large companies. The goal of the project is to set up an evaluation tool that can be used in a Latin American environment. Mexico is one of the two biggest economies in Latin America, but the main reason to choose for Mexico is the request of a Mexican company to ex-post evaluate their implementation.

This chapter will explain why the research has been executed and where the research is about. Therefore the background situation at the Mexican company will be described first. This results in a problem situation which will be further explained. Next a problem statement will be distilled from the problem situation. Finally the research outline will be presented.

2.2. BACKGROUND

This research has been set-up after a request from TradCo (TC); this is a pseudonym for the real company name. The company is in the final phase of an ERP implementation and asked to evaluate the implementation. After some superficial research in this field it becomes clear that there is only some literature written about this topic for Western countries and Asia (Lin, Hsu, & Ting, 2006; Zhou-sivunen, 2006; Kumar, 2003). But almost nothing is published for Latin American countries. So before the request of the Mexican company can be fulfilled there is a need for more information in the area of evaluating ERP systems in Mexico.

The request came from TradCo (TC). This is a Mexican trading company for promotional items. The promotional items are sourced mainly in China and Hong Kong and imported in Mexico where these are marketed locally. Only some products which are difficult to import, like lighters and some textile products are sourced locally. TC has been set up in 1998 and has been growing ever since. In the beginning the owner was able to handle the administration with simple software like MS Excel. But after a couple of years an ERP system was needed. In 2003 the first ERP system, ASAP was set in place. It did exactly what the organisation needed at the time. But growth figures of 30% a year for a few years in a row made the system obsolete, because it missed a lot of management functionalities. The need for a new system arose in the beginning of 2007. In this paper the situation from this moment on is evaluated.

In the beginning of 2007 the decision was made to start with the process of an ERP implementation. Therefore a team was formed to lead this project. The team consisted of the Commercial director, Head Information Systems and in the beginning also the CEO. After the selection for a custom build system was made the CEO was not direct involved in the project. The system is built special for TC with the same functionalities as a regular off-the-shelf ERP system and could be implemented at other companies in the future. The implementation team consists of the head Information systems and two or three programmers, depending on the workload at the different stages of programming and implementation. After the initial implementation period was expired the commercial director noticed large scheduling problems and initiated an external evaluation. The implementation is rescheduled and the intermediate evaluation started in the beginning of 2008. The project finally took three times as long as expected. After the completion of the ERP implementation the final evaluation starts in the beginning of 2009, the system is in use but still not yet delivered.

2.3. Problem statement

The implementation of the new ERP system at TC has been completed. The next step in this process is the execution of an evaluation. This evaluation will include the complete implementation process. This leads to the following problem statement:

"To which extent was the ERP implementation at TradCo successful?"

To evaluate this for TC, the main question is how to evaluate an ERP implementation. In today's literature there is no consensus about the elements which should be included in an evaluations and which not. For example the set goals are sometimes included in the evaluation (Teltumbde, 2000; Chiesa, 2004) and sometimes excluded (Bingi, Sharma, & Godla, 1999; Parr & Shanks, 2000). This means that an evaluation model for this business case needs to be developed, before this case can be solved.

2.4. Research questions

To answer the main question a research of scientific literature on ERP evaluations in Latin America is conducted (Trompenaars & Hampden-Turner, 1998). The countries in Latin-America are different, but in general share the same cultural characteristics. For this reason, the model is built for Latin America in general, but the cultural characteristics are adjusted to Mexico. The influence of these characteristics is per country different (Hofstede & Hofstede, Culture and organizations, 2005). This makes the model easily adaptable for future evaluations in other Latin American countries. The following research questions will help to find a solution for the problem statement.

1. How can the ERP implementation at TradCo best be evaluated?
2. How did TradCo actually implement its ERP system?
3. Which topics can be identified for future improvements with ERP implementations at TradCo?

The first question deals about ERP evaluation methods. What are the existing evaluation models and are those models usable for all implementations or are these written for a subset of all evaluations. To be more specific, are there yet models which could be used at TC right now. One of the main problems is the cultural difference between Latin America and the Western World. Most current models are built for the Western World and can't be copied one to one to Latin America (Trompenaars & Hampden-Turner, 1998). For this reason this research is focussed on the cultural differences and explains how to include these in the evaluation model. This question needs mainly literature research to be answered.

The second question clarifies the way TC has implemented the new ERP system. This mainly needs empirical research. This includes a description of planned process and the targets. Finally the deviation of the planning is described.

The third question is answered with the results of the first and second question. The topics which could be improved in the future are discussed.

2.5. RESEARCH DESIGN

This research is focused at the use of an evaluation model in order to give the management of TC a good report in which the implementation is checked and topics of interest for future implementations are given. With this in mind and a planning of the ERP implementation at TC, the choice is made to use a two phase research approach. First the company is visited for three months during the implementation phase. This visit is held during the implementation because that gives a valuable insight in the implementation approach and the techniques which are used. This is also important for indulging the atmosphere and culture at the work floor and results in the first data set. A second phase is held after the completion of the implementation. This phase needs mainly an interview and a survey since the connections with the employees were already set and the culture is known. For this reason the choice for a remote second phase is made, this results in the second data set.

For a better understanding the complete workflow is visualised in figure 1, in the description of the figure the numbers between brackets point to the block numbers in the figure.

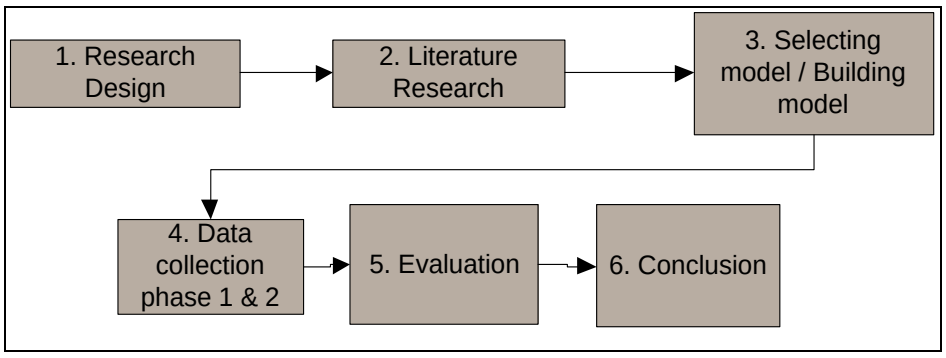


Figure 1 Research model in chronological order

The first step (1) is explained above. The second step (2) is the literature research. This research is first focussed at the evaluation models. There are two different evaluation models for system implementations, namely ex-ante and ex-post evaluation models. The ex-ante models evaluate the possibilities on forehand. This is used to search for the best system for the organisation. The ex-post models evaluate the complete implementation of the system after the implementation is finished. This is the kind of evaluation described in this report.

The literature research provides an ex-post evaluation model or different methods for partitioning the complete implementation in order to evaluate every part apart. The next step (3) is to find current models or critical success factors for every part and create a model for the complete evaluation. During the research it became clear that the timeline of implementation could be phased and that every phase can be described from different viewpoints, the process, content and context. This has all been described in chapter three.

The last part of the third step (3) is the creation of an ex-post ERP evaluation model for SME's in Latin America (eEEMSLA). Due to the three different viewpoints and the timeline phases this model has a matrix-structure. This model is presented at the end of chapter two.

The data collection of the fourth step (4) is executed in two phases; one phase on location in Mexico City and a second phase remote with surveys and interviews. During the first phase the co-working with the employees gives valuable insight into the corporate culture. Especially communication lines are clear and the use of these

lines. During this data-collection phase the main ways to get the data is by co-working and informal conversations with the employees. The reason for using these methods, which provide no structured data, is the culture of Latin-America. People tend to give socially accepted answers, especially when it's in a formal environment. Informal conversations will better reveal the true opinion of employees (Osland, Franco de, & Osland, 1999). This results in non-structured data-sets which are described in this report at the result section. Finally in the second and last data collection phase the use of structured data-collection methods is used. This has several reasons. First it provides the ability to better discuss the results and second it is easier to get a response of a larger group. The best method for doing this is an online survey. This has been chosen for its easy way to set it up and the low entry barrier for employees to fill it in. The structured data-collection has the form of a survey in this report.

The fifth step (5), the evaluation of the results, is described in the discussion. For every step of the evaluation model the results of the data collection are discussed. This results in the overall conclusion (6). In the conclusion the research questions are answered and finally a solution for the problem statement is given based on the answers of the research questions.

2.5.1. Method

The execution and results of the research design are presented in this report as follows. In chapter three all the relevant literature is discussed and at the end the building of the model is described. In chapter three the model is prepared to use at a Trading company in Mexico City (TC). Chapter four presents the methodology of using the eEEMSLA model and the data collection methods. In chapter five the results of this test case are discussed. The last chapter is the conclusion and contains two kinds of conclusions. First the conclusion of the evaluation at TC is given and second the result of the designed eEEMSLA mode in general is given.

2.5.2. Boundaries of research

This paper is written specially for TC. This means that the evaluation techniques which are used are especially chosen to be useful for trading companies in the SME sector in Mexico. It could be that the evaluation method will be applicable to other branches, but testing this is beyond the scope of this report.

Furthermore the research method is also designed with the kind of ERP system of TC in mind, a custom-built ERP system. For this reason applicability to off-the-shelf packages is not guaranteed.

3. THEORETICAL FOUNDATION

3.1. INTRODUCTION

This chapter gives a description of the process which led to an evaluation model for TC. It starts with a paragraph about the general reasons for executing an evaluation. In the second, third and fourth paragraph the process, content and context are described. These are the three main building blocks of the model which are presented at the end of the next paragraph. At the end of this chapter the designed model is presented and described.

3.2. EVALUATIONS IN GENERAL

Before proceeding to some evaluation methods, the reasons of evaluation in general are discussed. This paragraph is dedicated to the reasons behind evaluations.

3.2.1. USABILITY OF EVALUATIONS

Evaluations are important for an organization. This can be argued from the viewpoint of the employee or from the organization itself. Table 1 shows the arguments for evaluations, these are explained below.

Viewpoint	Employee	Organization
Arguments	Awareness	Prioritization
	Understanding	Decision support
	Motivation	Measurement of Quality

Table 1 Reasons for Evaluations (Russ-Eft & Preskill, 2001)

Evaluating a project makes employees aware of the project. And with the existence of the evaluation they get focussed on the project and it often is a motivation to support it. This is a good start for a successful project implementation, since user participation is an important aspect for a successful completion of a project. Finally the user participation results in a better understanding of the project, and builds also on a stronger relationship with the organization (Russ-Eft & Preskill, 2001). In conclusion, evaluations help in improving the relation between employee and organization.

Questions for Generating High-Quality Lessons Learned	
1.	What is meant by a "*lesson*?"
2.	What is meant by "*learned*?"
3.	By who was the lesson learned?
4.	What's the evidence supporting each lesson?
5.	What's the evidence the lesson was learned?
6.	What are the contextual boundaries around the lesson (that is, under what conditions does it apply)?
7.	Is the lesson specific, substantive, and meaningful enough to guide practice in some concrete way?
8.	Who else is likely to care about this lesson?
9.	What evidence will they want to see?
10.	How does this lesson connect with other "lessons?"

Table 2 Questions for Generating Lessons learned (Patton, 2001)

When reasoning from the viewpoint of the organization, it is often seen that only the measurement of quality is mentioned. Which is one of the arguments to execute an evaluation; but evaluating a project gives also information for prioritizing projects and decision support for the projects (Russ-Eft & Preskill, 2001). Another aspect of evaluation is the 'lessons learned'. Questions such as: "What have we learned from the project?" and "What should we do different next time?" will be answered during an evaluation. Important is the method of dealing with the 'lessons learned'. For every lesson learned there are ten questions which should be answered. These questions can be found in table 2 (Patton, 2001). It can be concluded that the evaluation of a project is even useful for the project itself as for the organization in general;

as it contributes direct and in the future at multiple areas within an organization.

An evaluation is more useful than normally thought. It has also positive side effects on the employees. So when initiating an evaluation its positive influence will be more widespread than initially thought. This means there is little reason not to include an evaluation. In the next paragraph the theory which has led to the creation of the model will be discussed.

3.2.2. Evaluation Theory

This paragraph will discuss the theory used for building the ERP evaluation model for TC. This means an ERP evaluation model for an SME trading company in Mexico. There are a couple of different ERP evaluation models developed, but most models do not fit an SME company in a Latin American country, because those models are based on a Western or Asian culture. Therefore a new ERP evaluation model is needed. In this chapter a model is build which fits at TC, the framework of this model is displayed in Figure 2. The model is referred to as eEEMSLA which means **e**x-post **E**RP **E**valuation **M**odel for **S**ME's in **L**atin **A**merica. Below the main building blocks of eEEMSLA are explained and thereafter an outline of this chapter in relation with eEEMSLA will be given.

EEEMSLA is a matrix model with process, content and context at the vertical axis and 4 chronological phases at the horizontal axis.

The first step in the creation of an evaluation model is the segmentation of the whole implementation. Therefore a division structure of three parts, namely *Process*, *Content*, and *Context* is chosen (Devos & Buelens, 2003). This segmentation is chosen for its possibility to include the context, as being the Latin American culture and the company type. But it also contains the possibility to include the process of the implementation without decreasing the possibility to evaluate the real delivered products as being the ERP system itself. These three parts are the three horizontal parts of eEEMSLA.

The Enterprise System Experience Cycle of Markus and Tanis is used to put chronology in the model with the four consecutive phases. The first phase describes the timeline till the selection of an ERP system and provider has made. The second phase describes the implementation phase till the system goes live and the third phase describes the timeline between going live and the moment that everything seems to be business as usual. The fourth and last phase describes the remaining time till the system is replaced or not used anymore.

In the next three paragraphs the building of eEEMSLA is described. Every paragraph discusses the theories of one part of eEEMSLA. All paragraphs will start with a thumbnail of a part of eEEMSLA. This thumbnail refers to the part of the model which is discussed in the corresponding paragraph. The process part is the first part to be discussed, because the process is the event initiator and the part that uses the theory which adds chronology into the model. This chronology is used in all three parts and is displayed as the four phases.

After discussing the theories corresponding to one of the three parts (process, content and context) an Analysis & Summary is given. The main topics of that part are repeated with an argumentation of their importance. Those topics are the main focus of eEEMSLA. In the last paragraph of this chapter the whole model is presented with an overall description of the model.

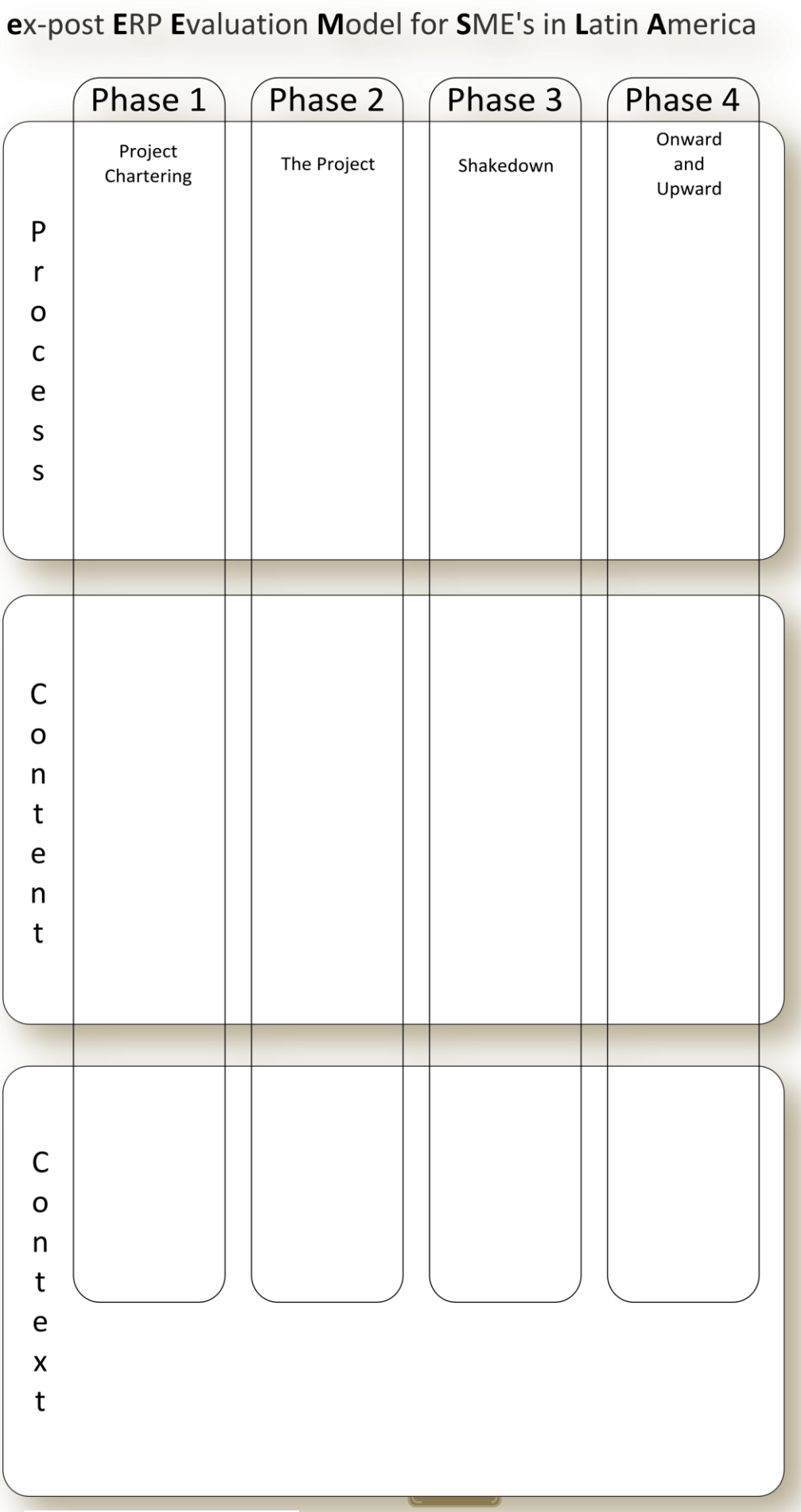
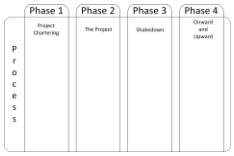


Figure 2 Framework eEEMSLA model

3.3. THE PROCESS



The implementation of a new ERP system in an organization is a process. The whole process exists of different phases which are separated to evaluate them well. There are different theories to separate the process phase (Markus & Tanis, 2000; Soh & Markus, 1995; Cooper & Zmud, 1990; Zmud & Apple, 1989). Table 3 shows the segmentation according to different authors.

Author	Year	Initiation	Adoption	Adaption	Acceptance	Reutilization	Infusion
Zmud and Apple	1989	X	X	X	X	X	X
Cooper and Zmud	1990	X	X	X	X		
Soh and Markus	1995		X	X			X
Markus and Tanis	2000	X	X		X		X

Table 3 Process segmentation according to different authors

For the process evaluation in this paper the model of Markus and Tanis is chosen for the following reasons:

a. The process of setting up the project needs to be included to be able to evaluate the set goals, as already discussed in the introduction.
b. The need for differentiating between Adoption and Adaption is in de case of TC not necessary. Especially adaption is not necessary, since TC does not need to adapt to the new system before it goes live. Because TC chose for a custom build system, in which the system is adapted to the business processes.
c. The opinion of the users is an important part of the evaluation, resistance for change is large in Latin America.
d. For the fast implementation and a long term success the infusion of the system is important.

The enterprise system experience cycle, as the model of Markus and Tanis is called, has four phases, namely *Project Chartering, The project, Shakedown* and *Onward and Upward.* These are the names which the author used for the phases, in Table 3 the general terms are used for a better comparison. For a visualisation of "The enterprise system experience cycle" see figure 3, this model will be explained below.

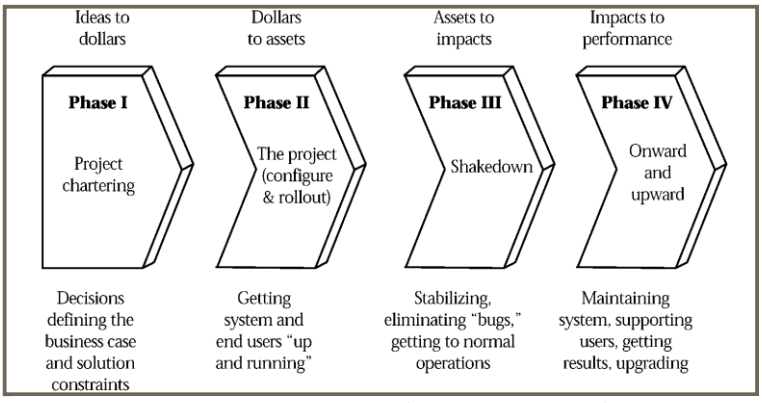


Figure 3 Enterprise System Experience Cycle (Markus & Tanis, 2000)

Project chartering is the first phase of a system implementation. It starts when the desire for a new system comes up. This phase includes everything from idea and feasibility study to goal setting and package selection. This directly means that it is not necessary that all phases will be carried out. If the feasibility study's results are negative, the project will stop. And the second to the fourth phase will never start.

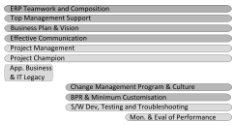
The Project (configuration and rollout) starts when system and provider has been selected. It includes the design of an implementation plan and the actual rollout of the implementation plan till the system goes live. When the system goes live the organisation

should be able to run the system by itself, with in the first month minor help from the consultants. So at the end of The Project phase nearly all consultants are gone.

The Shakedown phase has a clear starting moment, the going live of the system. The end of this phase is less clear, since it goes smoothly over into the next phase. This phase ends when everybody is using it as if it is the default system to use. During this period all the bugs are fixed and the users (employees) have to get used to it.

Onward and Upward is the last phase and does not have an end. At least, it ends when the system is not used anymore or replaced by a new system. In this phase the system is maintained and keeps up with the changes in the organisation. During this phase the positive effects of the new system should surface. If these positive effects take place the implementation is described as successful, if not it is not directly failed. Intervention can sometimes help improve the results. If this would not help either, the implementation is described as a failure. If this happens, it should not have been a surprise. Since the results of the evaluation should have already indicated that something was going wrong.

3.3.1. CRITICAL SUCCESS FACTORS OF THE PROCESS



The framework of Markus and Tanis needs to be filled in. Markus and Tanis have developed the critical success factors (CSF's) for their model, but their CSF's are not specifically made for ERP systems. Fui-Hoon Nah, Lee-Shang Lau and Kuang (2001) have developed a critical success factor model especially for ERP systems. This model describes 11 factors which are important for describing the process; these can be found in table 4. As all phases are important till the last phase, except "Appropriate Business & IT legacy Systems" which is only important in phase 1, the first phase in which a CSF starts to be important is mentioned in table 4. In paragraph 4.3.1 an explanation per CSF is given. (Fui-Hoon Nah, Lee-shang Lau, & Kuang, 2001).

This model has been chosen since it's based on an extensive research of the existing literature about CSF's for ERP implementations and fits well in eEEMSLA, since eEEMSLA is also based on the model of Markus and Tanis. The CSF's which are used are not separated for every phase. This means that the CSF's are important during more phases of the implementation. This is visualised in eEEMSLA by a separate zone for every CSF which covers one or more phases.

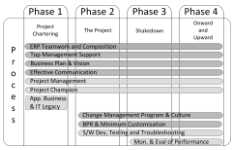
These CSF's do not all have the same importance. In table 4 a weight is given which equals the number of other models, investigated by Fui-Hoon Nah, Lee-Shang Lau and Kuang, which uses this CSF. The CSF's with a score of 6 or higher are CSF's which need to be positive during an implementation to let the implementation succeed. Because these are the CSF's that deal with the core process of an implementation. When applying the eEEMSLA model the

Critical success factor	Start phase	Weight
ERP Teamwork and Composition	1	8
Top Management support	1	6
Business Plan and Vision	1	6
Effective communication	1	6
Project Management	1	5
Project Champion	1	4
Appropriate Business & IT Legacy Systems	1	2
Change Management Program & Culture	2	7
BPR & Minimum Customisation	2	6
S/W Dev. Testing and Troubleshooting	2	5
Monitoring and Evaluation of Performance	3	5

Table 4 CSF's for an ERP system (Fui-Hoon Nah, Lee-shang Lau, & Kuang, 2001)

process phase is regarded as failed when the CSF's which belong to the core CSF's, score of 6 or higher, are negative valued. This cannot be compensated with the other CSF's.

3.3.2. ANALYSIS AND SUMMARY



Markus and Tanis' model uses a phasing which is easy to understand for everybody. It clearly describes the process of an implementation. The four phases are easy to understand because the phases are also in practice clearly different from each other. Another advantage is the possibility to use the four phases also in the Content- and Context segment. This makes it all fits well in eEEMSLA. The addition of the CSF's from Fui-Hoon Nah, Lee-Shang Lau and Kuang reforms the model of Markus and Tanis into a specific model for ERP systems. The CSF's are categorised in two groups, core CSF's which need to be positive for a successful process and the other CSF's which will, when negative, not directly lead to the failure of the complete process.

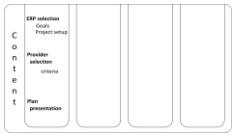
MAIN PROCESS TOPICS

- **Four process phases**: Project Chartering, The Project, Shakedown and Onward & Upward
- **Six core CSF's**: ERP Teamwork and Composition, Top Management Support, Business Plan & Vision, Effective Communication, Change Management Program & Culture and BPR & Minimum Customisation
- **Five other CSF's**: Project Mangement , Project Champion, Appropriate Business & IT Lagecy Systems, Software Development, testing & Troubleshooting and Monitoring & Evaluation of Performance

3.4. THE CONTENT

The process part is discussed in the previous paragraph and resulted in the use of the model of Markus and Tanis. The evaluation of content deals about the goals of every process segment, this means there will be four elements in the content part, with for each element its own way to describe the content. These four elements (Project Chartering, The Project, Shakedown, On- and Upwards) will all be discussed in different subparagraphs. The content of a system is sometimes referred to as the tacit system. The content is nowhere the same; it is dependent of people, organisation and also the context. In this paragraph the different content elements are discussed on basis of the current literature.

3.4.1. PHASE 1: PROJECT CHARTERING



There are a lot of different models developed for evaluating the content of the first phase. The model of Chiesa (2004) is a practical example. Other authors have developed also selection methodologies i.e. Verville, Palanisamy, Bernadas, & Halingten (2007). All those models are more or less the same. These describe step by step what needs to be done in the project chartering phase. There are also more in-depth models, Teltumbde (2000) describes a model for the Chartering Phase, which uses the model of Fitzgerald (1998) and Shankarnarayanan (1999) as basis. These are extensive models which are not necessary for eEEMSLA, but could be used when eEEMSLA shows that something went wrong in the Project Chartering phase. EEEMSLA uses the model of Chiesa (2004),

Phase 1 – ERP Selection
Activity 1 – *Document needs*
- Analysis of needs
- Determine Project team

Activity 2 – *First Selection*
- Market search
- First contact with providers
- Interview potential Candidates and gather information
- Set criteria
- Evaluate Candidates
- Document results from above steps and make plan of action

Activity 3 – *Final Selection*
- Visit Providers
- Product demonstration
- Negotiation and final decision

Phase 2 – Selection of Provider
Activity 1 – *Setup of search*
- Search the market
- Set criteria

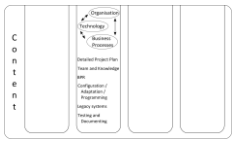
Activity 2 – *Selection of the Candidates*
- Gather information and interview Candidates
- Evaluate Candidates
- Negotiation and final decision

Phase 3 – Presentation of project planning

Table 5 ERP selection methodology of Chiesa

since this is a complete model which is easy to use and goes not too deep, which is good for an SME company. And the author is of Latin American origin, so the model will be better fit to a Latin American country. At SME companies not all steps are always executed (Rosenbrand, Dirks, & Meijaard, 2003). Evaluating with too many steps would result in a model that delivers for every implementation complete different results which are not comparable. The model of Chiesa is used as a fill-in model to check if everything is done and what the result is (Chiesa, 2004), see table 5 for an overview of Chiesa's model. After filling in this model with the facts of the implemented system, it can be used to see if the made choices are logical. In this model the most important elements, which can always be reconstructed, are the analysis of needs (including the goals), the determination of a project plan and the ERP and provider criteria. If these aspects are not included the content of the chartering phase is failed, because without these aspects there is no chance that a considered choice can be made. The next step is the implementation itself, this will be discussed in the next subparagraph.

3.4.2. PHASE 2: THE PROJECT

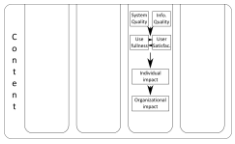


The project phase has also its own content aspect. Govindaraju's Intermediate Outcome Evaluation explains this well with the strategic triangle. This triangle exists of the three elements *business, organisation* and *technology.* Most of the failed implementations are caused by lack of proper business process redesign; this redesign between people, organization, 'ES supported business processes' and the enabling technologies are the key to success, and needs to be done in the project phase (Govindaraju, 2002). This fit between the three topics can also be found in the relevant topics for this phase by Markus and Tanis (2000). These topics will be described below.

First the general project plan needs to be detailed to cover all the aspects which are important to be executed. The selection of the team members who will and can carry out this plan is part of this phase. Sometimes team members need to be trained before they are capable of their job. This could be because somebody misses knowledge for a specific project. Sometimes it is better to acquire knowledge extern. When the project details are set and the team is complete the development of the system begins. This starts with the (re)design of the current and future business processes. The next step is the configuration of the system to the designed business processes. Sometimes the system needs to be adapted to the designed business processes. Another possibility, when the system is custom-build, is that the system needs to be completely written when the design of the business processes is finished and validated. In case of a custom-build system there is also a need for a detailed program plan, before the code will be written. When this is finished the communications with the legacy systems, if planned to be in use after implementation, needs to be incorporated. Than the final step, documenting and testing the system, will be executed. If this is all successful the system goes live and the next phase starts (Markus & Tanis, 2000).

Until now the evaluation focused at the system and organisation, in the implementation process the system goes live at this point. This means that the next two steps focus more on the employees. The next phase is the *Shakedown*. Here the new system is in use and employees get used to the new system.

3.4.3. PHASE 3: SHAKEDOWN



The shakedown phase is the first period after the system went live. In this period it is important that the employees get used to the system by actually using it. Using the system has an impact on the employees and on the organisation. This is the main topic of the content aspect in the Shakedown phase.

DeLone and McLean have developed an information system model, the I/S success model, about the effect of the system on the employees and finally on the organisation, see figure 4. In short this model says that *system quality* and *information quality* are the most important success factors of an IT implementation (DeLone & McLean, 1992). This model fits for an evaluation in a western country, but for a Latin American country it will not. If the employees are told to use the system, they use it in Latin America (Osland, Franco de, & Osland, 1999). This means that the *Use* element in the I/S success model does not work in Latin America. A modification of the I/S success model is made by Seddon and Kiew. They changed the *use* element in *usefulness* (Seddon & Kiew, 1996). This better fits with the culture of Latin America. Now the employees are asked for their opinion instead of monitoring their behaviour. Another well-known model is the Technology Acceptance Model version 2 (TAM2). This model also uses usefulness instead of use. This confirms the change in the I/S success model.

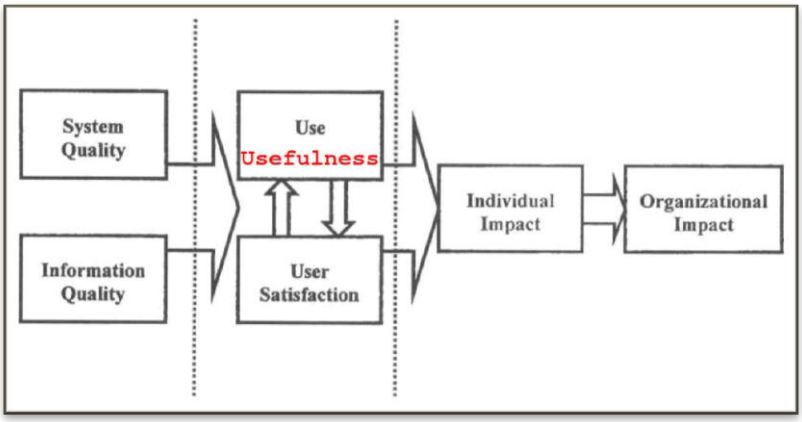


Figure 4 I/S succes model with in red the alteration of Seddon and Kiew (DeLone & McLean, 1992)

The modified I/S success model indicates that *system- and Information Quality* are the roots of *usefulness*. This is a narrow description of *usefulness* since more approaches are used. The Technology Acceptance Model version 2 (TAM2) uses also usefulness. In this model there are more roots of Usefulness indicated, namely Image, Job Relevance, Result demonstrability and some others which overlap with the I/S-success model (Legris, Ingham, & Collerette, 2003). This confirms the use of the usefulness element. Since it will be used here in an ex-post evaluation the approach is reverse. The system will be evaluated and not the behaviour of the employees, so the TAM2 roots of usefulness will not be included. The I/S success model has sufficient roots for our model.

In the next paragraph the long term effect of the implementation will be modelled.

3.4.4. PHASE 4: ONWARD AND UPWARD

The last phase of the evaluation starts when the employees are used to the system and experience it not as new anymore. From this moment on the final questions can be answered like: “What has the system brought us?” For this last part a model of Govindaraju is used, namely “Evaluation of Improved Organisational Effectiveness”. This model uses simple questions which encompass the main goals of the content of an implementation when it is in use.

The first question which arises when assessing organisational effectiveness is: “What is organisational effectiveness?” Govindaraju gives three dimensions for assessing organisational effectiveness, namely *Impact on individual, impact on managerial processes* and *impact on continuous improvement* (Govindaraju, 2002).

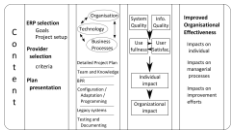
The implementation of an ERP system has impact on the individuals of the company. This has several reasons, the employee’s needs to learn a new system and this often involves training and sometimes also an extension of the task description. This extension is often a consequence of the increased effectiveness of the new system. These changes have impact on the individuals; it’s often a change of working culture which needs to be accepted by the employees (Govindaraju, 2002).

The impact on managerial processes handles about communications and coordination. The new ERP system will mostly deliver extended reports which results in better coordination and communication and finally in better management (Govindaraju, 2002).

The effect of an ERP implementation on continuous improvement can be extensive. New insights in working methods occur to surface when using a new system. This can lead to a change in business practice. This only happens when management encourage employees to indicate this kind of possibilities (Govindaraju, 2002).

This last model will fit into eEEMSLA in the fourth phase and describes the content of the system when it's already running. This means that now the performance of the system can be tested. If the system is a replacement system it can be compared to the old system. All the answers in this phase are very useful for management, since they want to see if the investment was worth it.

3.4.5. ANALYSIS AND SUMMARY



The phasing used in the process part is used in this content part as well. This results in four phases of content for which a concretization is required. Every phase is in short summarized hereunder.

For the content of the first phase (Project Chartering), a model was needed which fits by the Latin American culture and needed to include the evaluation of the goal setting. A model is found which describes the whole chartering phase in terms of content. The elements which are important in this phase are: goal setting, project setup, ERP- and provider criteria setting and finally a well-documented implementation plan.

The second phase (The Project) is the period in which the final system will be developed and build. Govindaraju described this as the streamlining of the Organisation with the Technology and Business Processes. To clarify this, the ideas of Markus and Tanis are used, their six steps features the three elements of Govindaraju. These six steps are: Detailed Project Plan, Team and Knowledge, BPR, Configuration/Adaptation/Programming, Legacy Systems and Testing & Documenting. These need all to be positive valued for a successful implementation.

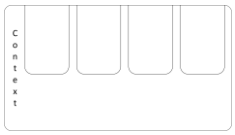
In the third phase (Shakedown) the system is finally in use. The content of this phase is the impact of the system on the individual and finally on the organisation. Therefore the system-, and information-quality is measured, this is done qualitatively. This results in an individual impact later in an organizational impact. These four content elements are all important, and when one fails the implementation is not successful.

The fourth phase (Onward and Upward) can be described as the final result, when looking at the content. In this phase the importance of the impact of the system on the individual, but also on the managerial processes and the improvement efforts of the whole organization is discussed. The general goals of an implementation are reviewed. If, in an exceptional case, some of the goals set in the chartering phase are not covered in this phase, those goals need to be included here to be evaluated in this final phase. If in earlier phases is concluded that the implementation is not successful it automatically results here in a failure on at least one of the three topics, impact of the system on the individual, impact of the system on the managerial processes and improvement efforts of the whole organization.

MAIN CONTENT TOPICS

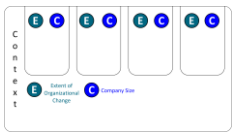
- **1st Phase**: Goal settings, Project set-up, provider selection criteria and implementation plan
- **2nd Phase**: Detailed Project Plan, Team and Knowledge, BPR, Configuration/Adaptation/Programming, Legacy Systems and Testing & Documenting
- **3rd Phase**: System- and Information quality with as result individual and organizational impact
- **4th Phase**: Impacts on individual, managerial processes and improvements efforts

3.5. THE CONTEXT



Culture and characteristics of SME's are the main focus points of the context element. The context of an organization is much broader, but for eEEMSLA the culture and characteristics of SME's are the two important context aspects for this research. In other cases other topics could be of more interest like: Environment, Politic, Law etc. But for an SME trading company in Mexico the SME aspects and the cultural differences will be the most important, because these differ mostly from a regular implementation in a western country. So these two topics will be discussed in this paragraph. In the eEEMSLA model are the SME and culture aspects displayed as circles, the circles are displayed in the phases where those are important.

3.5.1. SMALL AND MEDIUM ENTERPRISE (SME)



Literature about ERP implementations and evaluations is mostly written for large companies. But these companies face different "problems" than SME's. Since SME's make a large part of the whole Mexican market it is important to take the topics important for SME's into account. In this chapter the most important topics within SME's will be searched for.

LITERATURE REVIEW

In some countries SME's play a larger role than in other countries. But especially in developing countries, SME's play an important role, since it was not necessary in earlier times to compete with international players. So the national companies, mostly SME's, are not used to the global competition they encounter nowadays. In Western Countries SME's are in general innovative companies, but when looking at Mexico there is almost no innovation at the SME's. SME's were earlier not stimulates and were merely seen as companies which produces the second choice products for the local people and the multinationals produces high quality products for the export (Ball, McCulloch, Geringer, Minor, & McNett, 2008).

The global competition is often seen as a problem, and not as a chance to growth. For every company it is important to look at its strengths of its business and focus at its strengths. When a new software system is introduced, the main interest for a company is to get the maximum support for its core business. It is also a good moment to investigate the competition. Who are its competitors, what kind of companies are these and how will they compete and develop in the coming years (Chiesa, 2004). This could be done with the help of a SWOT analysis. With a SWOT analysis the **S**trengths and **W**eaknesses of the internal and the **O**pportunities and **T**hreats of the external organization are reviewed.

As SME it is important to keep the company flexible. When a new competitor arrives, be able to directly focus on own competences, which a newcomer can never have. Or when the basis is solid and geographically transferable, start the globalization expanding to countries which are similar to its home market (Dawar & Frost, 1999).

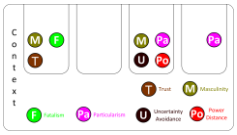
In a research in Mexico of Maranto-Vargas and Gómez-Tagle Rangel (2007) has been concluded that the focus at soft technology (methods and processes) is more important than financial possibilities. When a SME will focus at good internal processes it will get a high competitive advantage (Maranto-Vargas & Gómez-Tagle Rangel, 2007). There is an increased probability that the ERP package will fit the company when the competitive advantage has been investigated on forehand. The first step when selecting an ERP package is, to analyse what is needed. In that analysis it should the needs at future stages of the implementation should be taken into account before start of the implementation. When the complete system, like it will be in the future, has been blueprinted on forehand no disappointment will occur in the future (Chiesa, 2004). The internal processes cannot be seen as context aspects since they are also part of the implementation itself, but there are

two indicators of the difficulty of the implementation regarding the SME factors. These are the extent of the organizational change and the company size. An increasing change or size will result in a more difficult implementation (Buonanno, Faverio, Pigni, Ravarini, Sciuto, & Tagliavini, 2005).

A final point of interest at SME's and evaluating issues is impact of the security of the employees being anonymous when questions are asked about their opinion about the company and job related issues; If their anonymity is not guaranteed the answers will probably be coloured and thus not usable.

3.5.2. CULTURAL ASPECTS IN MEXICO IMPORTANT FOR ERP IMPLEMENTATIONS

INTRODUCTION



This paragraph zooms in on the differences between Mexico and the Western world in general and subsequently the differences when applies to IT implementations in organizations.

Finally the selection of elements from cultural aspects, general evaluation methods and ERP implementation methods will be used to make a new model to ex-post evaluate ERP implementations in Mexico, based on the aspects mentioned before.

CULTURAL DIFFERENCES BETWEEN MEXICO AND THE WESTERN WORLD

Every culture has its own specialties and neither two men nor two countries are the same. This means that the reaction of people in every country will be different. Most research to ERP implementations has been done in Western countries. The general management theories, which are mostly from North American and European origin, can be applied to other regions. But they cannot be directly used in another culture, because the effects in a different culture can be totally different than originally expected. The local characteristics of the culture need to be known and implemented into the theories to be successful (Osland, Franco de, & Osland, 1999; Hofstede G. , 1980). Although the theory of Osland et. al. is general for Latin America and not special for Mexico, the characteristics will be used for eEEMSLA since this model is designed for Latin America and where possible adjusted to Mexico. Later in this paragraph specific elements for Mexico are added.

In Latin America maintaining good relationships is very important. A lot of daily decisions are dependent on the kind of relationship you have. This aspect can be split in the following eight characteristics (Osland, Franco de, & Osland, 1999):

1. Simpatía
2. Personalism
3. Particularism
4. Trust
5. Paternalism
6. Power
7. Humour
8. Fatalism

Hereunder these eight topics characteristics are short explained. These characteristics are important, but are not measurable to compare countries. Therefore the view of Hofstede and Trompenaars will be discussed too. They have developed theories to compare cultures in different countries.

1. SIMPATÍA

Simpatía can roughly be translated as a positive social behaviour that emphasizes empathy, respect towards each other and harmony (Osland, Franco de, & Osland, 1999). Or, according to Triandis, simpatía is like a cultural script. It is like behaving with dignity and respect and be able to share in others feelings. Triandis found statistical evidence for the existence of the simpatía cultural script at Hispanic people (Triandis, Lisansky, Marín, & Betoncourt, 1984). This cultural script is very important for Mexicans, it is even more important than

general accepted business etiquette. For Mexicans social duties are more important than business matters. Because they expect it from each other, if a person considers his work as being more important than the cultural script, he will lose respect from one other. This is the worst what can happen to a Mexican. For this reason they also avoid a conflict and will try to see everything positive. This means that they don't want to say "No", and will probably try to say "Yes". Especially when communicating with someone higher in the hierarchy.

2. Personalism

Personalism is about the relationship a Mexican has with someone. A Latin American is not working because he uses to work, but because he has a personal relationship with the person he is working for. Depending on the kind of relationship he has with different persons, he will prioritise his to-do list (taking in mind that it is always easier to ignore a written request than a face-to-face request, insignificant from whom). But when you have established a relationship with someone, it will be long lasting and not easily broken (Osland, Franco de, & Osland, 1999).

3. Particularism

Particularism is the opposite of universalism. So instead of treating everything equal, they first look at the individual circumstances and personal relationship, and based on that the working procedure will be determined. This results in unpredictable reaction for foreigners, because they often don't understand the differences (Osland, Franco de, & Osland, 1999).

4. Trust

One important problem for Mexicans is that they naturally do not trust each other. This makes it very difficult in a business environment to delegate tasks to other employees. Owners or managers are not sure whether or not an employee would put its own interest first, instead of the company's. To overcome this problem tasks are specialised and people have to control each other. Here is the in- and out-group phenomenon applicable, if your in-group, you're trusted. But if you're out-group, you won't be trusted at all (Osland, Franco de, & Osland, 1999).

5. Paternalism

Paternalism can be translated like fatherly behaviour. This is exactly what happens a lot in Mexican families, the father cares about the whole family when taking a decision. But it is also visible in organisations. A manager will not fire an employee who needs to take care of his family (Osland, Franco de, & Osland, 1999). This behaviour can have a bad impact on a company, if it's not prepared for this kind of behaviour. The paternalistic behaviour goes most of the times together with an autocratic behaviour. This management style is still working for lower class employees, but the higher educated employees are less accepting this style nowadays (Stephens & Greer, 1995).

6. Power

Mexicans have, compared to western citizens, a different mind-set when it comes to work. A Mexican accepts that there are different stages in life and that there is a big power distance between the boss and the employees. They see it as honour, and they don't want to take away this inequality. This could work perfect, but managers tend to use the power also for their own profit. This is quite usual in Mexico, but this will conflict when a foreign manager enters (Stephens & Greer, 1995).

7. Humour

Humour is an important element of the Mexican culture, without humour the culture would be really different. It is used to create the famous "always happy and relaxed" atmosphere of Latin America. But also in business it has useful task. Critic will almost always be given with a joke. That's the way Mexicans can give critic to more powerful people or people higher in the hierarchy. This overcomes the problem of criticising someone above you (Osland, Franco de, & Osland, 1999).

8. FATALISM

Long-time Mexicans were believers of fate. But this changed during the last decade because of internationalisation of the markets. The companies had to change, because they had to compete with international companies (Osland, Franco de, & Osland, 1999).

This change happened several decades ago for western companies, and recently companies in developing countries have to make this change too. The competition will start, but not every country reacts in the same way. This depends on the culture. To make this clear Hofstede has performed a research to the cultural differences between countries, he used a situation in which people in more than 50 countries who were all working for the same company. This resulted in a clear view on the differences in culture. In the next paragraph his theory will be described.

THEORY OF HOFSTEDE

Everybody has his own culture, but some people share some characteristics of culture. Mostly these people live in the same nation. So this can be called a national culture. Between the nations there are differences in culture. People from different cultures will behave different. When you grow up you assimilate to the national culture of the country you live in. Of course there are also inter-nation differences. These arise because of the different circumstances of where you grow up, for example upper class or lower class and urban or rural family. But once you have "your" culture you will always behave like that and it is very difficult to change "your" culture. So when you interact with somebody from another culture you will experience differences in behaviour. These differences also exist between people from the same nation, with the same national culture, but these differences are smaller and easier to overcome. To overcome or deal with the differences between people from different nations it is important to know more about the other party's culture, so you can understand why people act like they act (Hofstede & Hofstede, Culture and organizations, 2005).

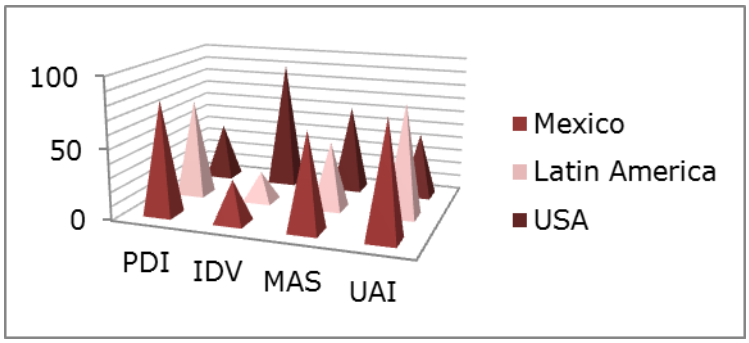


Figure 5 Hofstede comparison chart (Hofstede G.)

Hofstede has performed a research to these differences. The five dimensions for defining culture he found are:

- Power Distance
- Individualism vs. Collectivism
- Masculinity vs. Femininity
- Uncertainty Avoidance
- Long- and Short- term Orientation

He added the last dimension later to his model, after research by Asian scientists who missed this aspect from their view on cultures. The definitions of the dimensions can be found in Table 6 (Hofstede & Hofstede, Culture and organizations, 2005).

Dimension	Definition of Hofstede
Power Distance (PDI)	The extent to which the less powerful members of institutions and organizations within a country expect and accept that power is distributed unequally.
Individualism vs. Collectivism (IDV)	Individualism pertains to societies in which the ties between individuals are loose: everyone is expected to look after himself of herself and his or her immediate family. Collectivism as its opposite pertains to societies in which people from birth onward are integrated into strong, cohesive in-groups, which throughout people's lifetimes continue to protect them in exchange for unquestioning loyalty.
Masculinity vs. Femininity (MAS)	A society is called masculine when emotional gender roles are clearly distinct: men are supposed to be assertive, though, and focused on material success, whereas women are supposed to be more modest, tender, and concerned with the quality of life. A society is called feminine when emotional gender roles overlap: both men and women are supposed to be modest, tender, and concerned with the quality of life.
Uncertainty Avoidance (UAI)	The extent to which the members of a culture feel threatened by ambiguous or unknown situations.
Long- and Short-term Orientation (LTO)	Long-term orientation stands for the fostering of virtues oriented towards future rewards – in particular, perseverance and thrift. Short-term orientation stands for the fostering of virtues related to the past and present – in particular, respect for tradition, preservation of "face", and fulfilling social obligations.

Table 6 Definitions of the Hofstede Dimensions (Hofstede & Hofstede, Culture and organizations, 2005)

Figure 5 shows the comparison of Mexico with Latin America in general and the United States. In this figure has been chosen for the USA as an example of a Western World country. Within the Western world there are also differences, but these are on average minor to the differences with Latin America.

Figure 5 shows a very high power distance in Mexico when compared to the USA but also higher than in Latin America on average. The individuality index is low for Mexico; this indicates a collective based culture. But in recent years the individuality index of Mexico has increased. (Rao & Teegen, 2001) So the differences on this dimension are nil. Masculinity is also relative high in Mexico; this is a positive for companies. Since a masculine culture will "fight" to win, and thus in the interest of the company. Uncertainty avoidance is high in Latin America; this can result in difficulties for change management (Hofstede G.). So the main dimensions to take into account are the Power Distance, Masculinity and Uncertainty Avoidance.

CULTURAL EFFECT IN IT IMPLEMENTATIONS

The elements listed in the beginning of the culture paragraph, which form the cultural script *simpatía,* have impact on the implementation of ERP systems. Some of these characteristics are positive affected by this script and some neutral or negative. Personalism is one of the main issues which influence an implementation and should be seen as a shift in mind-set. Except humour all aspects are listed in Table 7 with the potential problem subjects within an implementation. Humour is a solution of Power; employees do not oppose their boss, but say it with a joke. For this reason Humour is not included in the Table 7.

Due to the high power distance in Mexico (Hofstede G. , Cultural dimensions in management and planning, 1984), changes of working method and procedures are more easily implemented than in the western world. Employees respect the wish of their boss, and follow his orders. This gives an advantage at IT implementations. But another aspect, Particularism, will make the new way of working not directly obvious. Mexicans are not used to stick to standard procedures, which is necessary at most IT applications and their working method. It is important to convince the employees to really use the system, in a broad sense (including attached behavioural rules). Otherwise the expected improvements might not surface. Close to this is the trust in the new system, if the employees don't trust the new technology or are suspicious about it, it will feed their Particularism ideas. This means that every occasion will be considered separately, environment, social status, hierarchy, relationship, etc, and followed by the action they think is best in this situation. But this won't always be the

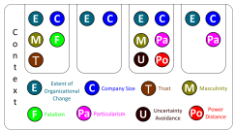
action which is prescribed. To prevent this, it is useful to include their opinion in the development process. Therefore you need to get them actively participating in the first phase (Project Chartering) of the implementation, because they will not participate by themselves. This is a demonstration of fatalism,

Influence of *Culture* at IT implementations		
Reason for difference	**Subject**	**Influence**
Personalism	Reason for working	Neutral
Power Distance	Change of working method	Positive
Particularism	Use of standard procedures	Negative
Trust	New technology	Positive or Negative
Fatalism	Active user participation at implementation process	Negative
Paternalism	Loyal to a relationship	Neutral
Masculinity	People will "fight" for the company	Positive
Uncertainty Avoidance	Change management will be difficult	Negative

Table 7 Influence of culture at IT implementations

they will wait and see what happens. Finally when evaluating the system, only a valid evaluation can be obtained, when the employees trust the person or group who is evaluating the system. Otherwise they will probably give answers which are generally desired. To overcome this, it's necessary to have a good trustful relationship (Personalism) with the interviewed employee, in order to get valid answers and subsequently a valid evaluation. The last subject which needs to be mentioned is the Paternalistic behaviour of Latin American people. It's a behaviour which could also be seen as part of the Personalism and Particularism; since it means that a man or manager will treat his family or employees as father. This can be positive when having a good relation, but also negative if a change is necessary but impossible because of the relation.

3.5.3. ANALYSIS AND SUMMARY



The context is an important element of the eEEMSLA evaluation model. It puts the model in a place which makes it easier to make expectations of the results of the process and content, since the context helps to answers the questions about how people react and how the business works.

Soft technology is important within SME's. The internal business processes are the soft technology of an organization. The soft technology needs to be up to date before implementing a new ERP system. If, for the implementation of the ERP system, there are much processes affected by the changes which are needed to implement the new ERP system, an increased risk for failure of the implementation is noticed. Therefore the extent of the organizational change in relation to the company size is an important context aspect at ERP implementations at SME's. Thus a small number of changes in a small company will result in a large negative impact on the ERP implementation, a small number of changes in a large company will be easily introduced without a negative impact.

When looking at the cultural differences it is important to realise that there is a complete different mind-set. It is not possible to completely change this mind-set, but the characteristics mentioned in Table 7 should be taken into account for a successful ERP implementation and evaluation. This will raise the awareness of the people's mind-set and makes it easier to understand why some responses are given. At the end of this paragraph the important characteristics from table 7 are repeated as being important, except from the elements Personalism and Paternalism. Personalism deals with the reason why employees are working and has a neutral effect on an implementation and therefore not included in the model, while paternalism in an organization deals with the fatherly relationship between employer and employee which has no special influence at an ERP implementation.

Main Context Topics

- **Extent of organizational change** in relation to the **company size** can predict the impact of the implementation
- **Power Distance** has a positive effect on the change of working methods
- **Particularism** has a negative influence on the use of standard procedures
- **Trust** is important in the negotiation phase between organization and system provider
- **Fatalism** results in a passive attitude towards user participation at projects
- **Masculinity** has a positive influence because people "fight" for the company
- **Uncertainty avoidance** has a negative influence, because a change brings uncertainty with it

3.6. ex-post ERP Evaluation Model for SME's in Latin America

The complete literature review of the process, the content and the context is used to create the ex-post ERP Evaluation Model for SME's in Latin America (eEEMSLA), see table 8. The model is created for a trading SME in Latin America, optimized for evaluating a custom build ERP system in Mexico. It could also be used for evaluation outside Latin America and for different branches, but therefore the model should be reviewed and customized for the specific region. This falls beyond the scope of this research.

In the beginning of this chapter the three main elements of this chapter are defined as Context, Process and Content. The model will not start with the context, but with the process; as the process is the main flow through the implementation. The context has an influence on the process, so it is not logical to start with the context. And the content has been designed in the same "format" as the process, thus starting with the process is most logical.

Process

First the process is divided into the four phases to clarify the process. For this division the model of Markus and Tanis is chosen. This model has four phases, project chartering, the project, shakedown and Onward & Upward, that divide the whole implementation into consecutive phases. This phasing is used for the content part too, which makes it fit perfect with the three part structure Process, Content and Context. The model of Markus and Tanis is not special made for ERP evaluations, therefore the process elements are replaced by the 11 Critical Success Factors (CSF) of Fui-Hoon Nah, Lee-Shang Lau and Kuang, which are special developed for ERP systems within the model of Markus and Tanis. This resulted in the first part of eEEMSLA, namely the process. Six of the eleven CSF's should be positive during an implementation because those form the core process of the implementation. If these are negatively valued the process part of the evaluation is failed. These six elements are dark grey in Table 8.

Content

In every process phase there are a couple of activities which are executed. These activities result in content. This content does not have general characteristics except that it is generated in a process phase. This generated content is evaluated; therefore evaluation methods are needed for every process phase.

In the *first phase* the set-up of the project is evaluated, including the defined goals for the whole implementation. The complete model of Chiesa is executed to get a well-formulated project plan that will be implemented. The elements that should be positive during an implementation to let the implementation be successful are: **the set goals, the project setup, the provider selection and the final project plan**. These four elements form the backbone of this chartering phase (phase 1). If these elements are not positive valued during the evaluation, the complete first phase has failed.

In the *second phase* (The Project) the execution of the implementation of the new system is done. This process is modelled with the intermediate outcome evaluation of Govindaraju. She said that this is about the balance of the Organization with the Technology and Business Processes. An ERP system is the bridge between these

three areas and therefore this intermediate outcome evaluation framework is used. To further specify these topics the critical points at the content of Markus and Tanis have been used, namely **Detailed Project Plan, Team and Knowledge, BPR, Configuration/Adaptation/Programming, Legacy Systems and Testing & Documenting**. All need to be positive valued for a successful implementation.

The *third phase* is the Shakedown; this phase delivers the impact of the system on the organization and its employees. To model the process from system to impact, the I/S success model of DeLone and McLean is used. This model focuses exactly on what is needed, namely the **impact of the system and information on the users and organization**. When the system goes live it is important that it has a positive influence on the organization. This influence starts always at the employees. Therefore this model is used.

Finally the *fourth phase*, Onward & Upward, is evaluated. This is done with the model of Govindaraju because she describes in a simple manner the three important aspects of the whole implementation, namely the **impact on the individual, the impact on the business processes** and the **impact on the improvement of efforts** to improve the current way of doing business. These three aspects are the final results of the implementation.

Context

The context is an influence on the implementation; therefore the phases have not been drawn to the bottom of the context box in Table 8. The different context elements from Table 7 which have a positive or a negative influence on the model are included in eEEMSLA. The elements which are special for SME's, '**extent of organizational change**' and '**company size**' are important in every phase of the model. Especially in the first phase these are important, because that is the moment that the project plan is written and this aspect can be taken with it. But because the course of the implementation can change during the implementation, these elements remain important. If the course changes, these elements can change too with as result a positive or negative influence on the whole implementation.

Phase 1: Project Chartering

The culture elements are mainly interesting in the first and third phase. In the first phase, Chartering Phase, important decisions will be made. When employees or the ERP team self have a reactive instead of proactive attitude it decisions are taken on incomplete information. For this reason **fatalism** is an important aspect in the first phase. Sometimes **masculinity** can level the fatalistic elements; therefore masculinity is in the first phase important too.

Phase 2: The Project

In the second phase, The Project, the configuration, adaptation and programming are executed. Depending of the situation more or less culture aspects can be important. Since eEEMSLA is optimized for a custom build ERP system without a redesign of the business processes, in this phase the main activity is programming, testing and going live of the system. This means that no special culture aspects are influencing this phase.

Phase 3: Shakedown

In the third phase, Shakedown, the new system is just live and all employees need to work with the new system. This means that there are changes in working methods, although the business process changes can be as little as possible a new system means changes. Latin American people have an **uncertainty avoiding** character, so changing to a new system can result in resistance because of the new uncertain situation they enter. Every employee can react different on the situation, since they asses every situation in the context of that moment (**Particularism**). This means the reactions are difficult to predict. The positive elements for the change are the **power distance** and **masculinity**. The Power distance results in an obeying behaviour of the employees that makes changes easier. This counter speaks with the particularistic behaviour, this makes the prediction difficult.

Phase 4: Upward and Onward

In the fourth phase the culture aspect **Particularism** plays an interesting role, a system has been implemented which will standardise much, but Latin American people are from origin not motivated to use always the same path. So the particularistic influence can influence the way the system will perform after a while.

Use of eEEMSLA

The model has been designed and explained always in the same other till now. First, the process, than the content and the context last. This has been done to discuss similar aspects at the same time. But to use the model a more chronological method is used. When using this model the first step is to evaluate the first phase, there after the second phase and so on. For every phase the three parts, process, content and context, are executed. This will finally result in the eEEMSLA model with for every aspect noted if it was positive, neutral or negative, this is the basis for the final conclusion of the evaluation.

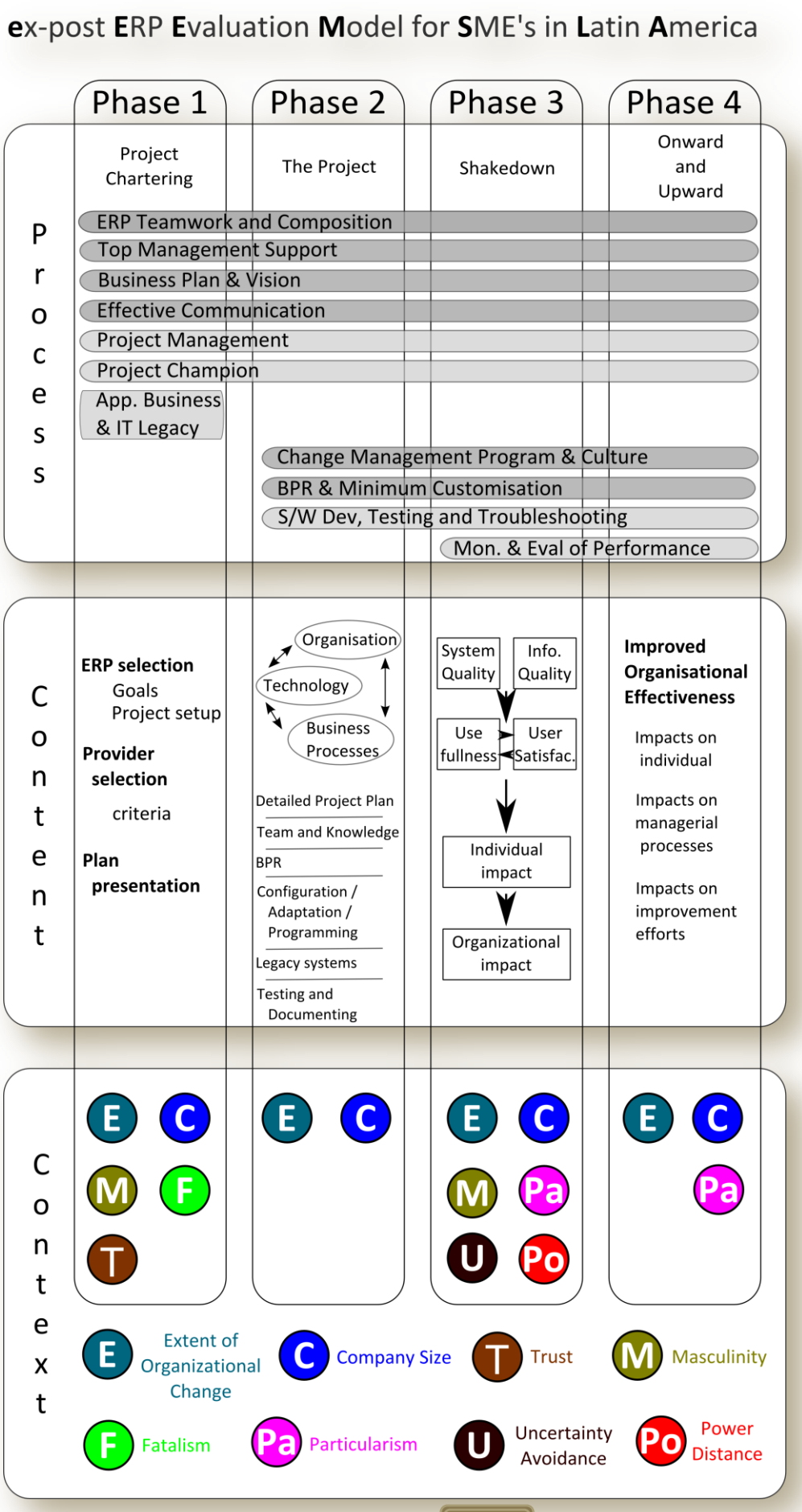


Table 8 ERP Evalution Model for SME's in Latin America (eEEMSLA)

4. RESEARCH METHODOLOGY AND DATA COLLECTION FOR TC

4.1. INTRODUCTION

In this chapter the application of eEEMSLA at TC will be described. First the applicability of the model needs to be validated. Therefore the design characteristics of eEEMSLA will be compared with the situation of TC. Next the data collection methods will be described. The data collection will be linked to, by using the structure of, eEEMSLA. EEEMSLA is leading in the way it is explained in the last paragraph of chapter 3. This means the model is used in chronological order. The application starts with phase 1, including the three parts (process, content and context) and then phase 2 with the three parts, and so further. Finally the overall analysis method of eEEMSLA is described with as result the judgement of the implementation.

Before proceeding to the applicability of the model an explanation of the research method is given. The model is in principle designed for the assignment at TC. But can be used at more cases. Therefore it is also presented as being a general model with TC as test case. For choosing the best methodology the guidance of P. Geurts is used. He described 11 sorts of research of which only one was applicable to organizational research, namely fieldwork. The data collection methods described to use fieldwork are: participating observation, survey, governmental statistical information and interviews (Geurts, 1999). These methods will all be used, except governmental statistical information. This research at TC is pure internal without connections to the outside world. This means that governmental statistical information is of minor interest. The methods participating observation, survey and interviews will be completed with document reviews. Document review can also be seen as observation, but to make the sources of information more visible the decision has been made to present the document reviews separately.

4.2. APPLICABILITY OF MODEL

EEEMSLA is developed with scientific theory as foundation. This means that the applicability of eEEMSLA for TC needs to be tested before it can be used in practice. Table 9 shows the characteristics of eEEMSLA and TC, the match between them is explained below.

	eEEMSLA	TC
Characteristics	Designed for SME's	SME
	Designed for Latin America	Mexico is a Latin American country
	Designed for the whole implementation process	Process has just been finished; so last phase is not yet possible to execute
	Data of complete implementation needs to be available	Data is available, except of last phase

Table 9 Comparision EEEMSLA vs. TC requirements

EEMSLA is designed for SME's in Latin America. Some choices during the development of eEEMSLA are based on the fact that it will be first used at a trading company with a custom build ERP system. TC has 120 employees and one office, this means that it falls in the category SME (Ayyagari, Beck, & Demirgüç-Kunt, 2003). TC is a fully Mexican company, although management is mainly from Dutch origin. But the main language is Spanish and the corporate culture is Mexican. This means that TC needs an evaluation model for a Latin American country. During the research at TC the implementation was still in progress and the survey was hold a few months after going live, this means that the implementation was yet completely finished, because it was still not business as usual. When putting TC in the eEEMSLA structure, TC was not yet in the last phase. So only the first three phases of the model can be applied at TC. The data needed for the evaluation is available. Finally is concluded that the eEEMSLA model is applicable at TC.

The result of the comparison of eEEMSLA with the situation of TC is positive. The only inconsistency is that the implementation at TC is at the moment of writing in the Shakedown phase. So the evaluation could be executed, but cannot include the Onward and Upward phase. This means that, when this model will be used, the long term effect of the implementation will not be part of this evaluation.

4.3. Data Collection

For the collection of data has been chosen for an observation and participation (fieldwork) period and a survey. The fieldwork has been carried out during the implementation of the system. This resulted in a good image of the organisation and the work processes. Finally a survey is used to get the opinion of the employees in the evaluation. Since there are three groups of employees which can answer different kind of questions there will be three versions of the survey, one for management members, one for the IT department and one for all other employees. In this chapter there will be references to the survey questions, document reviews, observations and interviews; these will respectively be noted between square brackets with the abbreviation sur., doc., obs. and int., for example [sur. 3.5] which refers to survey table 3 question 5. The survey can be found in Appendix A.

EEEMSLA will be used for the research, but it needs to be operationalized before it can be used. Now for every part of the model the operationalization will be explained. This will be done in chronicle order. Finally the elements for the survey and the elements for the fieldwork will be collected to form two research sets, namely the fieldwork and the survey. In figure 10 eEEMSLA is showed with rectangles around the areas masking the different collection methods.

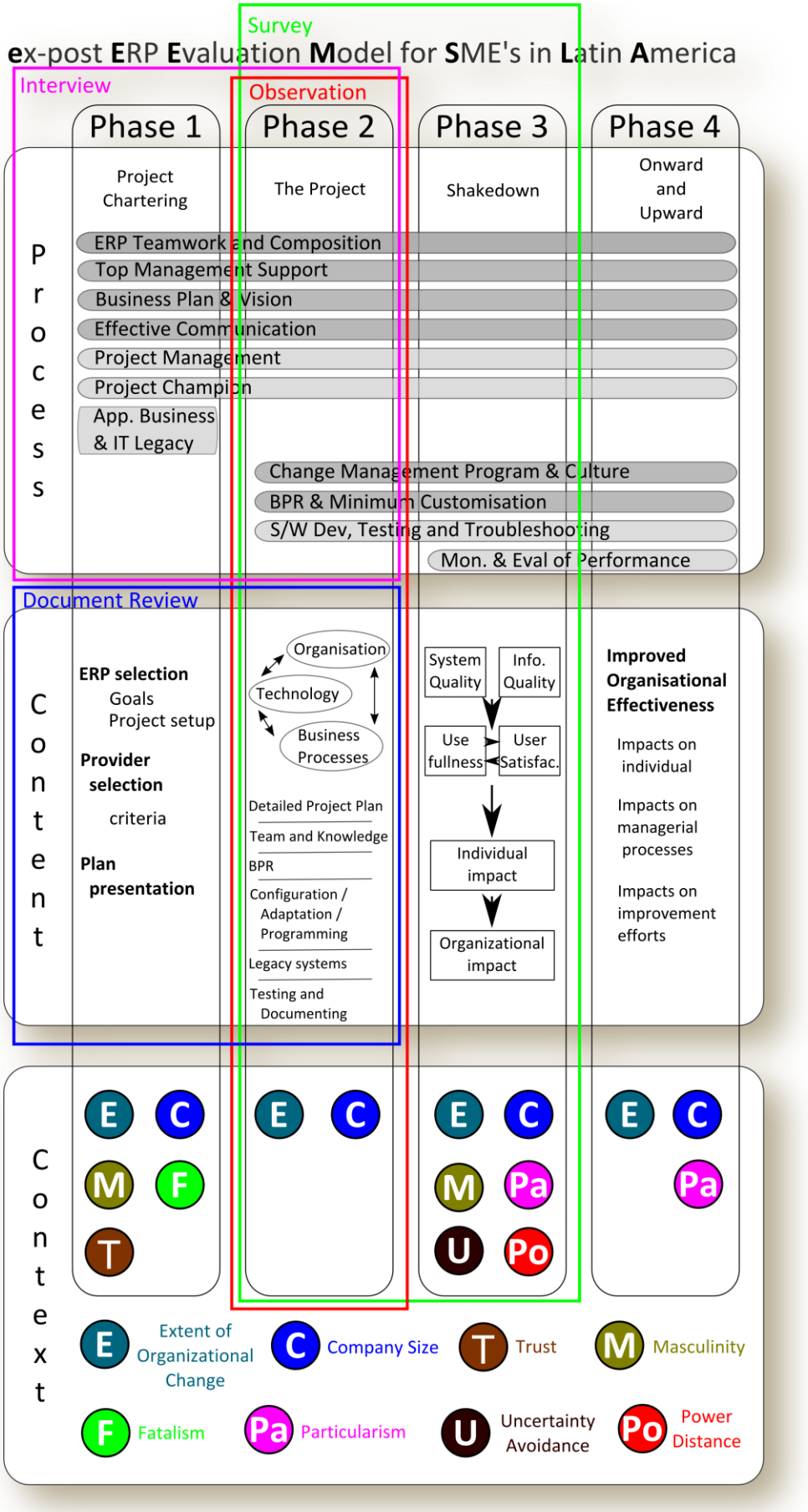


Table 10 EEEMSLA with sources as rectangles

4.3.1. Phase 1: Project Chartering

The implementation of the ERP system starts with the "Project Chartering" phase. In this phase the management forms a team to start the process to implement an ERP system.

Process

The eEEMSLA model provides 7 critical success factors which will be evaluated. These 7 factors are not only important in phase one, but these are factors which play an important role throughout the whole process.

ERP Teamwork and Composition is one of the first important topics. The composition is important; it should include the best people in the organisation and form a cross-functional team which is assisted by external consultants of the ERP provider. This should result in a team which has enough technical knowledge of the ERP system and the business processes at TC. The fieldwork resulted in a description of the team and the way it was functioning [obs. IT department; int. general project leader, project manager IT]. This topic is translated to two survey questions to measure the opinion of all users about the business-process and technical knowledge of the implementation team. [sur.1.4 & 1.5]

Top management support needs to be realised at the beginning of the project; this includes addition of the ERP implementation to top priority and the provision of enough resources by top management. This is evaluated in the fieldwork by interviewing management about this topic [int. senior management] and in the survey by questioning all users about their perception of the top general top management support for the whole ERP implementation. [sur.1.6]

Business plan and vision needs to be available to guide the implementation. This plan should include the costs, necessary resources, timeline, benefits and risks. This plan will be evaluated on these topics in the fieldwork by examining project documents [doc. project plan] and in the survey the extent of project description in the project plan will be questioned at management and IT-staff. [sur.1.7]

Effective communication is during the whole implementation important. Communication is the key to success. It spreads the vision through the organization and makes resistance but also positive reactions visible. This way the business plan is adjusted by new insights. The communication lines are visible during the fieldwork [obs. communication] and the opinion of management and employees about the effectiveness of the communication during the whole implementation will be questioned in the survey. [sur.1.8]

Project management is related to teamwork and composition. Someone or a couple of persons within the ERP team are responsibility for the whole project. Without a responsible person nobody feels the need to accomplish the whole project within the set boundaries. Top management is interviewed during the fieldwork about the way the project was managed [int. senior management and general project leader]. And the opinion of management and IT-staff about the project management will be questioned in the survey, including the subject project plan control and project documentation control. [sur.1.9, 1.16 & 1.17]

Project champion will clear the way for the implementation of the project. He is supported by the project sponsor. The sponsor is a high level executive who supports the project at all times. The champion and sponsor are identified during the fieldwork [int. senior management]. In the survey all users are asked rate the functioning of the champion. [sur.1.11]

Appropriate business and IT legacy systems are important aspects in this first phase. Business processes and environment should be stable and healthy before the implementation starts. During the

fieldwork this will be discovered by informal talks [int. general project leader]. But also in the survey the employees are asked to the business climate before the implementation. [sur.1.12]

CONTENT

The goals of the "Project Chartering" phase are described in the content. This results in a plan presentation. But there are also sub-goals which need to be evaluated. EEEMSLA included the model of Chiesa; see Table 5, to evaluate this. The model of Chiesa is divided into 3 parts and these will be sequentially discussed hereunder. Since this is completed in the first phase of the total implementation the employees are not involved in this part and will not be questioned about it. Therefore the data for this part will be collected during the fieldwork period by having informal interviews with management and IT-staff.

ERP selection, in this part the needs of the organization should be set and the project team will be formed. As stated in the CSF above this is important, since it influences the complete implementation. Points of interest will be the team composition. It is of main interest that employees from different departments which will use the new ERP system are represented in the implementation team. This means that at least the following departments need to be involved: top management, IT-department, HRM, and from every department which will use the future system one key user. The needs of the organization will be discussed with the whole team and finally fixated. This means that the whole team agrees with the set goals for the new ERP system. When these goals are not unanimous agreed, the implementation should not go further [doc. project plan]. Since the ERP system will be a significant part of the companies' backbone. In the survey management will be asked which processes are planned to be included in the ERP system [sur.3.4].

The team should perform a market research to the available ERP systems. This should be done, before contacting any consulting company, in order to get an objective comparison of the market possibilities. This market research should be finished with a report with a comparison of all the possibilities with a final choice for the system. [int. general project leader; doc. project plan] In the survey management is questioned about ERP selection criteria, which product has been chosen and the number of providers which are asked for a proposal [sur.3.5, 3.6 & 3.7].

Provider selection is the next step which should be done. With the ERP system choice in mind the search for an implementation partner (provider) can start. This results in a selection report and the final decision will be made. When the implementation partner advices another system than earlier selected, it will judged if this is interesting, since this comparison is made internally before. In a rare case the well-founded advice of the implementation partner is taken over. Document review should reveal information about the selection process, which providers have been selected and which criteria have been used. [doc. project plan, planning] In the survey the provider selection criteria are questioned at management [sur.3.8].

Plan presentation is de last step of the first phase. When the system and implementation partner have been chosen the final project plan can be written in which all details of the new ERP system and provider will be included. This will be a joint document which is validated by both parties. The final presentation of the project plan should be hold [doc. Project plan].

CONTEXT

In this first phase there are a few contextual elements which need attention. In the eEEMSLA model the contextual points of interest are: Extent of Organizational Change, Company Size, Masculinity, Fatalism and Trust.

On forehand should be judged how complex the implementation of the ERP system will be by estimating "**the extent of the organizational change**" and "**the size of the company**". The second one

is easy to estimate, the more employees and processes a company has the more complex the implementation is. But the extent of organizational change is more difficult to estimate. It depends on the quantity of changes in business processes. If no business processes change and no new processes are introduced, the implementation does not have additional difficulties. This will be evaluated during the fieldwork, by questioning about the forecasted complexity of changes [int. general project leader] and in the survey by questioning about the integration of existing (changed) business processes in the new ERP system. [sur.1.2, 1.3] The users are asked to describe the existing ERP system and which departments are missing in the new ERP system [sur.3.1, 3.3].

On the cultural aspects of the project chartering phase eEEMSLA indicates the assessment of **masculinity**, **fatalism** and **trust**. When the employees have a fatalistic attitude it will be more difficult to let them actively participate in the implementation team. In some cases the masculine aspects can level this, when members see the use of the team. Once they are convinced of the use of the team they will work for it and the fatalistic behavior will diminish. During the fieldwork attention will be paid at this topic in general by observing the corporate culture [obs. culture] and it will be included in the survey with direct questions about their believe in fate and the attitude on masculine and feminine topics [sur.2.2 & 2.6]. Trust is in this first phase important because there needs to be a trust relation between the provider and TC to share all necessary details for the implementation. At the fieldwork this will be asked [int. general project leader].

4.3.2. Phase 2: The Project

In this phase the chosen ERP system will be implemented to finally let it go live.

Process

The eEEMSLA model prescribes the important CSF's for the processes as being the same as in phase 1 expanded with four new CSF's, the already described CSF's are not repeated since there is nothing new. Except from the element Appropriate Business & IT Legacy Systems, this CSF is only in the first phase important and not anymore in this phase.

Change management program and culture is a CSF that starts when the project phase starts. From the beginning on changes in organizational structure are needed to let the ERP project be successful. This can be changes on different areas of the organization. The most tangible are the changes in business processes, but also changes in culture and communications are important. During the fieldwork it will become clear if the changes are set in from the beginning and in the survey the culture change during the implementation will be questioned. [obs. culture, communication; sur.1.13]

Business process redesign and minimum customization are relevant to be discussed since in the project plan is described what needs to be done. So when the project is running the redesign of the business processes should only focus on the adaption of the business processes to the ERP system. But this will be minor in the case of TC since they have chosen not to adapt the business processes to the system, but the system to the business processes. This topic will be researched during the fieldwork [doc. organization structure, project plan]. In the survey is management questioned about the differences in implementation of the ERP system at the departments [sur.3.10].

Software development, testing and troubleshooting is important to keep the new system compatible with legacy systems. This results in the linking of different systems, which is a great source of problems. This should be tested well on forehand to prevent the troubleshooting afterwards. But also in the beginning of the project phase is the development of the overall architecture important to overcome complex adjustments later in the process. The scale of this CSF heavily depends of the chosen system and the integration of legacy systems. This topic will also only be researched during the

fieldwork by observing the working methods and reading the blueprints of the system [doc. blueprint ERP program; obs. Knowledge, IT-department].

Content

The process phase elements have been discussed, now it is time for the results of the process, namely the content. But what needs to be delivered in terms of content in the second phase? The eEEMSLA model prescribes the triangle of Govindaraju. This triangle consists of Organization, Technology and Business Processes. It means that the new ERP system implementation needs to result in a situation where these three elements are well balanced in the organization. To accomplish this eEEMSLA prescribed six important content goals. These will be described below.

Detailed project plan is already available from the chartering phase. But this plan is not yet detailed enough for the project phase. This means the project plan needs to be extended with the planning of the project phase. This plan includes elements as responsibilities, planning and deadlines. This is the first deliverable of this content phase and should be continuously updated and validated by the whole team. This will be researched during the fieldwork by reviewing the project plan and its history and in the survey by questioning management about the updating of the project plan and planning and management and IT-staff about the validation of the project plan [doc. project plan, planning; sur.1.10, 2.1 & 3.2].

Team and knowledge Next step is the check if all the necessary knowledge for the implementation is available. Since the project plan is made more specific, there is a possibility that the requirements in skills are changed. This could mean that the team composition should be changed or extended to resolve the shortfall. This will be evaluated during the fieldwork by observing the working manner and interviewing the project manager IT [obs. knowledge; int. project manager IT]. In the survey this is questioned by asking all users about the knowledge of the implementation team of business processes and IT [sur.1.4&1.5]

BPR (Business Process Redesign) is a major part of the evaluation. During this phase changes in the organization, which are necessary for the new ERP system, are executed. The extent of these changes varies between organizations. It is important to keep track of the successful execution of these changes. When changes are not executed according to plan direct intervention is necessary to prevent delays or implementation failures. The execution of the changes will be researched by reviewing the organization structure, the project plan and interviewing the general project leader [doc. organization structure; int. general project leader].

Configuring / Adaptation / Programming is the main part of the whole implementation. In this phase the new system will be prepared for the organization. Depending of the kind of system which has been chosen, the results will vary. Like an off-the-shelf package will not include much programming, but if the decision had been made to use a custom build system it involves almost only programming and not much adapting and configuring. This part will be researched during the fieldwork by interviewing the project manager IT [int. project manager IT].

Legacy systems need to be linked to the new system. This is not in every implementation necessary; it depends on the legacy systems which will still be in use after the implementation of the new ERP system. If there are systems which will be in use after the ERP implementation, it should already be taken into account at the previous topic, namely the configuring/adapting/programming. This topic will handle only the linking of the systems and the troubleshooting of it. This is often underestimated, since the team has little experience with the legacy software in terms of compatibility. This topic will also be evaluated during the fieldwork by observing the working procedures and interviewing the

project manager IT and in the survey with a question about changes in hardware [obs. knowledge; int. project manager IT; sur.3.9].

Testing and documenting is the last step of content creation in phase 2. In this step it is important that the test results will be made available and the documentation of the system finished. This is the final step of the implementation; therefore this step includes also the delivery of the system. Before this delivery the system should have enough capacity, current data from the old system needs to be converted to the new system and the key-users need to be trained and prepared to train the other users. This will finally result in a working system. In the survey management is questioned about the training and all users are questioned about the data conversion [sur.1.15 & 1.18].

Context

In the second phase the contextual elements do not play an important role. In this phase everyone is doing his job to prepare the new ERP system. Only the SME contextual elements which are also in the first phase important are here important too, namely extent of organizational change and company size. But these topics are already discussed in the first phase and will therefore not be repeated here.

4.3.3. Phase 3: Shakedown

In this phase the employees are going to use the system for the first time. This is the main idea of this phase, the settle down of the new ERP system. This phase will also be divided into the three phases, process, content and context.

Process

For the process the CSF's which are discussed in the previous phases are still applicable there is only one new CSF which is only applicable in phase three and four. This one will be discussed below.

Monitoring and evaluation of performance is one of the most important processes in this phase. It mainly consists of the processes to control the shakedown of the implementation. The main issue is to monitor the progress of the expected benefits of the new system. To get these results it is important that milestones and targets are set to track the progress of the implementation on project management and production management. The results are used for the evaluation of the whole implementation. This will be evaluated in the survey with a question for management about the delivered quality of the system and a question for all users about their opinion of the new ERP system. [sur.1.14 & 3.11]

Content

The content part of phase 3 handles about the impact of the system on the organization. The eEEMSLA model prescribes the use a modified version of the I/S success model. Below the collection methods for this model are described. The survey questions used for this part are derived from the work of Gable (Gable, Sedera, & Chan, 2008).

System quality refers to the quality of the delivered system from a technical and design point of view. The completeness, usability, actuality, speed, uptime and adaptability are measured by the employees. Since this is one of the most important topics, including the three topics below, there has been included a large number of questions in the survey [sur.1.35 – 1.43].

Information quality is about the correctness, usability, availability and completeness of the outputs of the system on screen and in reports. The measure of this will also be executed by the survey [sur.1.29 – 1.34].

Individual impact refers to the changes the system has brought to the employees. The new system should have a positive influence on them, as a new system should improve on all aspects. This will also

be measured in the survey by questioning the users about effectiveness and productivity [sur.1.19 & 1.20].

Organizational impact refers to the main target of an implementation, namely the improvements for the whole organization. Measurements about the improvement of the capabilities of the organization will be executed in the survey on the topics of costs, productivity, capacity and business positioning [sur.1.21 – 1.28].

When all data about the above four points is collected, the 'Individual Impact' should be positive if the 'System Quality' and 'Information Quality' are positive too. For negative 'System and Information Quality' the 'Impact on the Individual' is negative too. But when only one of the topics 'System- or Information-Quality' is negative the impact will depend on the situation. The 'Organizational Impact' will be the same as the 'Individual Impact'. When the results do not comply with the above theory, the results need to be carefully interpreted to find the inconsistency in the answers and thus the problem in the system.

Context

Since this phase deals mostly about the employees and their opinion; it is logical that the cultural aspects are of major interest in this phase. The culture is described in the context. The context in this phase consists of the following elements: Extent of Organizational Change, Company Size, Masculinity, Particularism, Uncertainty Avoidance and Power Distance. Only the last three elements are not described before in earlier phases, so these are described here.

Particularism is an import aspect in this phase, especially when managers of non-Latin American origin are involved. They will have difficulties in interpreting the reactions of the employees. In this phase employees' reactions are important to let the system work well. Therefore the employees need to use it and accept it. To test the extent of Particularism a question about interpretation is added to the survey [sur.2.5].

Uncertainty Avoidance is important in this phase since it can be difficult for employees in Latin America to change to a new uncertain situation, it can lead to strange behavior. For this reason they try to avoid uncertain situations, which results in a situation where real opinions of employees are difficult to measure. In the survey it will be questioned by a question about choices and uncertainty [sur.2.3].

Power distance is relatively high in Mexico, but is changing to a lower level depending of the region and kind of work. Employees respect their boss and would not disagree with him, because it's a kind of honor to respect his 'power'. This makes evaluations harder because negative feedback from users might not be given, the only way they will express negative issues is by means of a joke. The survey will check the extent of the power distance by a direct question if the users like the distance or not [sur.2.4]. To ensure that the highest possible accuracy of the employees' opinion will be reached the survey has been executed totally anonymously.

Phase four could not be executed because the implementation project is not yet in this phase. In a year the last phase can be evaluated too. The results of the new system should by then be clear enough for evaluation.

4.4. Method of Analysis

In the previous paragraphs the needed information has been described. This results in information about every aspect when the evaluation is executed. The information is qualitatively judged which results in a positive, neutral or negative judgment per aspect. This also means that there is no norm for every aspect to which the results can be measured, the interpretation of the interpreter is leading in the current version of eEEMSLA. These judgments are displayed in the eEEMSLA figure by highlighting the aspects green, yellow and red for

respectively positive, neutral or negative. This judgment version of eEEMSLA will be the graphical representation of the evaluation.

For every phase a judgment will be formulated. This judgment is based upon the process and the content. The context has only a positive or negative influence on the process, and is afterwards more an explanation for the results. The process aspects which are dark gray in eEEMSLA as well as all content aspects need to be positive to get a positive phase result. Because it is one project, the processes will have a big influence on several phases. This means that when the process is negative it will often result in a negative result for all phases. Only after a failed first, the second phase can be positive since choice made in the first phase can be positive implemented. But when the second phase is negative the third phase has a high probability to be negative too. The final result of eEEMSLA will be dependent on the results of phase 3 and 4, if one of these phases is negative it means that the final result of the implementation is negative and therefore the conclusion of eEEMSLA will be negative.

5. Case study

5.1. Introduction

This chapter describes the case-study which is executed at TradCo (TC). This article starts with a profound introduction of TC (paragraph 2). For the evaluation of the ERP implementation a period of three months, March 2008 till June 2008, is spent at TC in Mexico City. In this period interviews, document reviews and observations have been done to gather data about the implementation. In January 2009 the new ERP system went live. To gather data of the period after the going live of the system a survey is carried out in December 2009. These two moments of data gathering resulted in four data sources, namely document reviews, observations, interviews and a survey. This data will be presented per source to keep the data as objective as possible (paragraph 3). After gathering the data the analysis according to eEEMSLA started. This is done as described in chapter 4, this means in chronological order from phase 1 till phase 3. Phase 4 is not evaluated since the implementation was not yet arrived in phase 4 (paragraph 4). When all data is evaluated in eEEMSLA the final conclusion of the evaluation is drawn, this is done with the graphical representation of the data in eEEMSLA (paragraph 5).

5.2. Company description

Key figures TradCo:

Employees: 120 (70 production/50 office)
Locations: 1 office in Mexico City
Founded: 1998
Branch: Trading promotional items
Competition: Number 2 in Mexico

5.2.1. Activities

TC is a company which is specialised in the trading of promotional items. Currently it imports most articles from China and sells it on the Mexican market. It has two divisions, namely 'Distributors' and 'Final Clients'. Only large companies or clients which needs large volumes are directly served by the 'Final Clients' department. Smaller clients are forwarded to distributors. For these smaller distributers TC serves as a wholesaler. This function is served by the division 'Distributors'. The division 'Final clients' delivers all kind of promotional items, from standard stock items to special designed promotional items. The division 'Distributors' delivers only standard stock items.

5.2.2. Mission and vision

TC has set a mission, a vision and the goals for the near future. The vision of TC is: "To become the number one company in promotional items in Mexico". To realize this vision, TC has formulated the following mission: "TradCo provides high quality promotional items for a reasonable price. The company offers a complete service, and provides clients with promotional items suited to their specific needs". This mission can be strived for in different ways. TC set three goals to project its way to the fulfilment of her mission. These goals are:

- "To offer good service to the customers and distributers"
- "To capture a larger market share in the market for promotional items"
- "To improve the cooperation with final clients by working together with them on the development of special promotions"

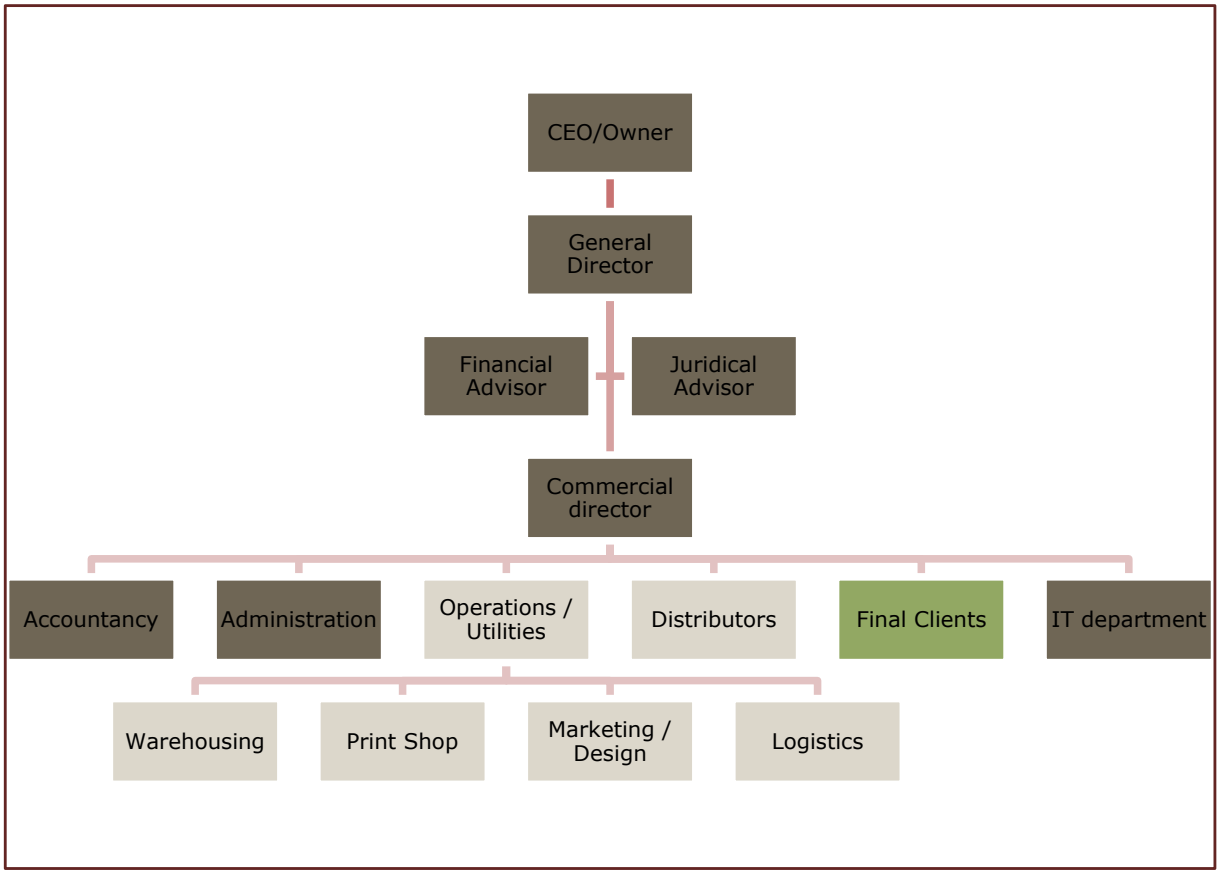


Figure 6 Organization chart TC

5.2.3. COMPANY STRUCTURE

TradCo is the outside name of the company. Internally it has two divisions, which are already introduced above. The division 'Distributors' has a complete logistic process from purchasing to distributing and the division 'Final Clients' exists only of a Sales department and the facilitating departments. The complete logistics are outsourced to the division 'Distributors'. In the organization chart in Figure 6 the division 'Final Clients' is marked green, the division 'Distributors' is marked light brown and the dark brown elements belong to both divisions.

5.2.4. FACTS, FIGURES AND HISTORY

TC has been founded in 1998. Since its start it has been growing rapidly with double digit growth figures in the last 3 years. The main reason for its success is that TC always sticks to the deals made. Late deliveries are very rare; this is the most important unique selling point of TC.

This rapid growth of the organization has its negative side effects. The IT systems to support the organization are not growing with it and need to be updated. For this reason a new ERP system is implemented. This implementation project has not been carried out as smooth as expected, which is the reason to initiate an external evaluation.

The history of the IT systems at TC starts with the founding of TC. In the beginning the complete administration was kept in MS Excel. But after a few years a system was needed to keep up with the expanding administration. In 2003 the introduction of ASAP was a fact. This system was able to keep track of the orders, the stock values, the sales and purchasing. But it did not include an extensive reporting module. For the first years it was more than enough for TC. Simple logistics and management methods were sufficient to run the company and let it

grow rapidly. After a couple of years the expansion of TC kept on going and new warehouses at various locations were added, which could not be included in the system. Also the ambition of using an e-commerce system to keep in pace with the currently used IT technologies is not possible with the old system. And last but not least the missing reporting facilities to keep track of the day to day business. This resulted in the need for a new ERP system that could support these wishes and solve the problems.

5.3. Empirical data

In the beginning of 2007 TC decided to start the process of searching for a better solution. An ERP implementation team was formed, which consisted of the General Director, the Commercial Director, head IT and the head Sales. This team changed when the package had been selected. The General Director and head Sales left the team and external IT-specialists joined the team when the provider had been chosen. The empirical research data will be presented in four categories, according to acquiring source. The four sources are: documents, observation, interviews and a survey. First the empirical data will be presented per source; next an analysis of the data will be made according to eEEMSLA.

5.3.1. Documents

During the period at TC in Mexico relevant documents of the ERP implementation has been studied. In general there was no well-structured archive of project documents. The documents which have been studied are the project plan, the planning, the new organization structure and the blueprints for writing the new system. The document which is missing is the ex-ante evaluation report, which is the evaluation report of the different ERP systems and providers that should have be done before selecting an ERP system. All the documents were only in hardcopy available.

5.3.1.1. Project plan

The project plan is a pile of papers with no clear structure, partly written by the ERP provider and partly by TC itself. The part of TC itself is very small. It contains the important aspects of the implementation. These are not detailed described, but are more written in form of a reminder. There are proposals of different providers, but no comparison has been documented. This has been discussed in a meeting. The proposal of the winning ERP provider is extensive; it includes a team description, a planning, strict deadlines and costs. The risks of the project are not documented. This proposal is completely focused on the software side of an ERP implementation. Nothing is written about the changes in business processes, culture changes or communication lines. But the request of TC was also to build a system like they already had; this means that there will be almost no changes in business processes.

The initial project plan was never updated to new insights during the implementation. This resulted in an outdated document which was not used anymore since most of the content had been changed. Unfortunately the changes were mostly not documented. Some of the meetings resulted in an e-mail confirmation, but there was no standard for archiving and reporting changes.

5.3.1.2. Planning

The project plan included a planning made in MS Project, which was for the proposal very extensive. It divided the whole project in different processes with for each process a timeline. This planning was also a good visualization of the whole project. It indicated the important deadlines, the quiet moments and the peak moments. This planning was a good starting point and didn't need any extension when the project phase started. But also the planning wasn't updated during the implementation. This resulted in a planning which was after a couple of months of no use, since most processes were delayed and the planning not updated. After 6 months an update of the planning was made. Unfortunately this planning wasn't updated either and outdated soon after.

5.3.1.3. ORGANIZATION STRUCTURE

There was no plan for changing the organization structure. The old structure, as showed in figure 6, was the structure of TC and will be the structure of TC. But the old structure was not well executed. With the implementation of the new system the original intention of the organization structure will be realized. This means an official split of the company in two different companies. The working procedures will not be different, only the system needs to handle the requests of the two companies different. The old organizational structure could not be realized with the old ERP system. The differences with the new structure are visualized with the colors. The green color refers to the company which deals with the final clients and outsources the complete logistics to the company Distributors. All light brown parts belong to the company Distributors. The dark brown parts are part of both companies. This split in the organization structure should give a better view on the results of the different parts of the company and realizes an internal market mechanism which should result improved efficiency.

5.3.1.4. BLUEPRINT ERP PROGRAM

The ERP provider created a blueprint of the new ERP system on basis of the project plan and the old system. This blueprint consisted mainly of visual relations between the different modules and the characteristics of the modules itself. Since the new system was mainly based on the old system it was according to them not necessary to create a fully detailed blueprint. But also these blueprints are never updated with new features and wishes of TC and insights of the ERP provider. The new modules were discussed with the project leader IT, the programmers and the external project member; they invented a solution to imbed the modules, but the solution was neither added to the blueprint or to the project plan, it existed only in their minds. The architecture of the ERP framework has never been carefully thought-out before starting the programming.

5.3.2. OBSERVATION

The period of three months at TC in Mexico can be seen as a long observation period. In this period interviews with different employees are hold, documents have been read and some co-working has been done. While working in this area, the company and its way of doing business has been observed. The observations have been divided into four categories, namely IT department, Communication, Knowledge and Culture. The categories are chosen to cluster the observations and make the observations accessible without putting any form of interpretation or analysis in it; the categories are not related to eEEMSLA.

5.3.2.1. IT DEPARTMENT

As evaluator of an ERP implementation the default place to be is the in-house IT department. For this reason this is the department which has been best seen from the inside. This department was almost fully outsourced to the ERP provider. This meant in practice that only one employee of TC was working here. He did the general IT maintenance and was the support desk for TC. The rest of the IT staff was from the ERP provider, they provided the head of IT and two, sometimes three, programmers. Later an external project member joined the staff.

The external project member joined because of the difficulties with the authorization and the linking of the different modules. The most striking aspect of the working manner of this team was the large amount of time which was spent at discussing the design of the system. These discussions were most of the time ad-hoc and no minutes were drawn up. The original targets were soon outdated and no new targets were set. New deadlines were only indications as nobody worked harder to meet them. The time efficiency was low.

5.3.2.2. COMMUNICATION

In the whole organization structural planned meetings are not found. Most meetings are planned if someone has a need for it. This results in ad-hoc meetings without agenda and minutes. In general this should not be a problem. But it can act as a source of problems. For example, sometimes there is no need for a meeting, but

when a meeting would have been hold topics could have been handled pro-active instead of reactive. This has happened with the ERP implementation too. The business processes were not changed, so there has no change in communications been carried out.

There is not much communication between the IT department and the users of the system, except the support for problems. More communication between the ERP implementation team and the future users could have realized more support for the project and as a result a better fit between system, organization and technology. There is a key-users group which should inform the IT department about the wishes from the users with respect to the ERP system. The initiative for these meetings lays at the IT department, which only organize meetings when they have to tell something and to inquire. No pro-active input from the users is seen during these meetings.

5.3.2.3. KNOWLEDGE

The ERP provider did underestimate the complexity of developing an ERP system. They have estimated it as a standard program to develop. In the beginning it worked well. But after completion of a few modules it became clear that the interdependencies of the system are more complex than expected. The main problems for complexities were attributed by the security and authentication issues. To solve these problems an external expert on these topics (external project member) is hired to coach them. This resulted in a delay of the implementation. The expert needed time to read up on the system and thereafter explain the team how to proceed. This process took time and finally the expert ended up in spending a large amount of time in the design of the system. Although the key-users, the head of IT and the team leader should have enough knowledge of the business processes and technology to design the system, it remains hard to bring it into practice. The ERP system did not need to be linked to legacy systems, therefore no problems with knowledge of legacy systems has been encountered.

5.3.2.4. CULTURE

When entering the building of TC a strict way of doing business is noticed. Everybody who comes in needs to check in with a time registration and visitors get a visitors batch. When inside everything looked clean and well organized. People are friendly to each other and there seems to be a calm and positive work environment. The offices are well designed and furnished and support a positive work environment. Only a few offices aren't nicely designed, namely a director's office and the IT office.

When talking with the employees in general a friendly atmosphere is felt. But after having a deeper conversation with the employees the power distance between different layers in the organization becomes clear. The layers which are shown in figure 6 are all except the lowest one, directly noticeable in a conversation. For example the owner of TC is by all employees referred to as "Licenciado", the Spanish title of someone with a Master degree. But also the general director and the commercial director are clearly placed at a higher rank in the hierarchy. But in the hallway everybody makes small talks with everybody.

After co-working at TC with the employees some more remarks should be made. At TC there is a systematic difference in the way the employees handle Mexican employees and foreign employees. A foreign employee gets a different treatment when compared to Mexican employees. The rules seem not to be as strict as these are for Mexican employees. These come out when rules are violated; nobody (dares) to say something about it, at least not face-to-face.

The internal working methods are bureaucratic. For a lot of actions approval of an executive is needed, and it seems that the employees are happy with this working method. But this situation does not motivate creativeness, since approval will be more difficult to get and this way it supports fatalism. Since executives need to approve most decisions; they have a good impression of the wellbeing of the employees at work and in personal life.

During the three months at TC no changes in corporate culture have been noticed. This is also difficult, since culture is intangible and takes time to understand. Changes could have been realized but not noticed.

5.3.3. Interviews

During the period at TC informal talks took place, since formal interviews wouldn't reveal the real opinion of the employees. The results of these informal talks are presented in the following paragraphs. The descriptions follow a chronological order and deal mainly with the process part of phase 1 and 2; if other parts are included this is mentioned.

5.3.3.1. General Project Leader

Phase 1: Project Chartering

His regular job is commercial director, but within this project he is the general project leader. His experience and place in the organization made him the best person for this job. It was beginning 2007 that he discussed the growth of the organization with the CEO. The growth of the organization was impressive, but he said it was difficult to keep a good overview over the organization and the processes. He said: *"How could we manage articles with very short cycle times, if the reports we use are a week old?"* The reports are exported from the system, edited by the secretary and finally he gets them. This way he makes decisions a week too late. Of course the planning is adjusted in order to let this delay in reporting not be interrupting our core business. At this time he could still handle it, but if TC grows further he will lose the overview. This was the main reason to start searching for a new ERP system, since the old system could not be expanded or changed.

The current organization of functioning perfect, in terms of business processes. Everybody knows exactly what he must do. Therefore he didn't want to make changes to the business processes, because the employees are not very flexible and to bring them in an uncertain situation will decrease their motivation and with it their production. The company is legally fragmented in four different entities, but for the ERP system only two of them are important, namely 'Distributers' and 'Final Clients'. It is very normal for him to only talk about 'Final Clients' and 'Distributers'. In the old ERP system he could not make a difference between them. This meant that for the report this was sort out manually in the reports. And the last problem he mentioned was the number of warehouses. He said: *"We have 5 warehouses, and our old system could only manage 1… I am still wondering how we have managed that"*. So the last main requirement for the new ERP system was the inclusion of multiple warehouses.

The goals for the new system were clear and he started inquiring information about different providers and systems. He formed a team to discuss the different proposals. The CEO, project manager IT and he were participating in this team. The proposals he received varied from regular ERP packages with a large number of consulting hours to reform the organization till a custom build ERP system which would fit perfectly with the current business processes. The choice was easy; we wanted a system which was not expensive which could be implemented without changing the business processes. This meant we choose the custom build ERP system. He also pointed on the fact that he had experience with this provider. This provider was already taking care of the IT department. This meant that they knew already how TC is functioning and have already connection with the employees which facilitates the communication lines.

Phase 2: The Project

The start of the implementation went well. He was very satisfied with the planning and the concise project plan they had made. With the start of this new phase he changed the implementation team, the CEO left the team and three programmers joined the team. He handed over the daily responsibility to the project manager IT. He was more a champion of the system, tackling the problems on organizational issues to let the implementation succeed.

Since the chosen option was a custom build ERP system the main activity in the beginning was programming. His office was next to the office of the IT department, but he still did not get all information about the implementation. In the beginning this was not a problem, he was informed and everything seemed to be going well. Halfway the implementation he got doubts about the progress. It seemed not to be going according to plan. A serious discussion followed and the planning was updated. He hoped that this was sufficient to let the team work according to plan. But again the planning was not met and the ERP provider kept on saying it will be finished soon. He requested an external project evaluation. But also this time

The team did not work with strict deadlines which resulted in a delay in the planning. Since the team was sitting at the IT office the general project leader could not see why the planning was exceeded time after time. There were no new features added to the wish list which could cause the delay. From his point of view, bad internal communications and not working with real deadlines caused the delays. The general project leader was not daily involved in the project and was more a representative from TC. The project manager IT was the person who had the daily responsibility of the project. When the project did not finish on time, he decided to start an external evaluation. This evaluation started March 2008, and the system was still not ready. Weekly meetings did not result in more progression. The team was stuck in technical difficulties, which he couldn't help. The suggestion to get external help was taken over by the project manager IT. An external project member was added to the team and solved the problems. But this took a long time. The system was finished in October 2008 and went life after testing in January 2009.

PHASE 3: SHAKEDOWN

It took about a half year after the system went live before he said, the system is implemented. Finally in December 2009 still not everybody was using the system. He said: *"I can say it time after time, but it is still difficult to get some employees change to the new procedures"*. But in the end he is happy with the system, although the implementation could have been much and much smoother.

5.3.3.2. SENIOR MANAGEMENT

As CEO he was not involved that much in the whole implementation process. Only in the beginning, the first phase, he was participating in the team, but that was mainly because of the main financial issues and to get the top management support which is necessary. In this period the different providers are invited and presented their solution. He let the main decisions to the general project leader since he had more experience with these systems. As CEO he was the sponsor of the implementation. He was always positive about it and explained it to the employees as a positive change they are going to make.

Somewhere in the end of the second phase he said: *"Maybe we took the wrong the decision, since the costs are higher than expected and I still don't see what we get"*. But he never let the team down; he has the mentality to learn from mistakes. He has always supported the implementation and never mentioned any doubt to anyone.

5.3.3.3. PROJECT MANAGER IT

One of the problems at TC is that during the project new features are added to the wish list for the project. This resulted in the delay of the complete project. And the project manager IT agrees that on some topics the project has been underestimated, but the addition of new features to the system is the main reason. It would have been a lot easier if all features were known in advance, because the blueprints of the system needed to be changed to include those new elements, and changing the existing modules to include the new features costs a lot of time extra. To overcome the underestimations an extra project member has been added to the team. He has a lot of experiences in this field and we can learn a lot of him and now they can deliver a complete secure system. Besides that he takes care of setting up of the documentation of the system.

5.3.3.4. EMPLOYEE

There was not much communication about the implementation of the new system. He did not know what the planning was and if there were any changes. The current system works well, but he needs to enter a lot of already available digital data into Excel sheets and the current ERP system. It would have been great if they had involved us more, then our problems with the old system could have solved too. Like he said that at the moment the number of steps to insert an order could be reduced too. But he does not know if these issues will be solved with the new system.

5.3.3.5. EXTERNAL PROJECT MEMBER

The implementation was far behind schedule and there was no expectation of improvement in following the planning and delivering the requested system. He was needed to help the project leader with redesigning the system to include the elements which were overlooked before or added later. Further problems for which his assistance was needed included the system security. Especially on the topic of user authorization could be much improved. This was more important than the team expected in the beginning, because the system needed to be ready for e-commerce which meant access from the internet must be possible and secure. Another part which was overlooked was the documentation of the system. He started with a framework for the documentation. Overall he was surprised about the little planning that was made to design this system.

5.3.4. SURVEY

Almost all information above has been gathered during the period at the office of TC in Mexico City. But at the time of leaving Mexico City, the system was far from ready. Therefore a second part of research was planned to include the results of the implementation. A survey has been used to measure the results of the implementation. The survey includes questions of almost every aspect of the first three phases of the eEEMSLA model. The results of the survey can be found in Appendix A. The most striking results of the survey, when comparing the answers of management, IT-staff and users, will be mentioned below in Table 11.

Question number	Remark
1.4	Management interpreted the business process knowledge of the implementation team as good, while the employees see this as insufficient.
1.8	Management and employees agree that the communication about the whole implementation was insufficient.
1.10	Management regards the project plan as well updated with all changes, while IT staff says opposite.
1.15	Management regards the staff as insufficient trained, while the IT team said it is trained well.
1.19 – 1.42	At all these questions management answers mostly very positive while the employees are almost always negative. This range is questioning about the performance of the system, the information quality and the personal- and organizational impact of the new ERP system.
2.2 – 2.6	These questions deals about culture, there is a big difference between the employees and the IT-staff & Management. One remark should be made, management is of Dutch origin and the employees are almost all Mexican.

Table 11 Remarkable outcomes of the survey

5.4. ANALYSIS

In the previous paragraph the results of the empirical research at TC in Mexico City have been presented. This presentation of data is structured per source type. This is done to make it as objective as possible.

For the analysis of the data the structure of eEEMSLA, as explained in chapter 4: Research Methodology and Data Collection for TC, will be used. This means that the model will be walked through from phase 1 till phase

3; phase 4 will not be evaluated because the implementation is not yet in this phase. For every phase the process, content and context part will be analyzed. All elements in every phase in every part of the model will be valued as being positive, neutral or negative during the implementation at TC. Per phase a conclusion is given. (Paragraph 5.4.1 till 5.4.3) Finally when all three phases are analyzed the overall conclusion is given. This overall conclusion is drawn from the graphical representation of all the results of the analysis, see Figure 7.

5.4.1. PHASE 1: PROJECT CHARTERING

The analysis starts with the process part of this phase. Management had mainly three reasons for searching a new ERP system. First of all the old system was not able to generate real-time reports, which resulted in decisions on old data. Second the system did not fit anymore to the organization structure, multiple business units and warehouses were not possible use in the system. And third the old ERP system could not be extended to facilitate an e-Commerce function. Employees complained that it took too much steps to insert or change orders. This means that the whole organization agreed that a new system is useful. But management and employees did not have the same objectives regarding the new system.

PROCESS

Here the process part of the first phase will be evaluated according to the eEEMSLA model.

ERP teamwork and composition was not very well executed. The team consisted of members of senior management, IT department and Sales. But the administrative employees were not involved. This has its effects on the set goals for the ERP implementation. The team had **enough business knowledge**, but large implementations were not executed before. This resulted in **marginal documentation** of the project proceedings and **missing steps in the ERP system selection**.

Top management support was completely as wished. Senior management understood exactly why the project was executed and did not inhibit the project in any way and **provided all the resources** necessary. But it should have put more pressure or importance at the provider decision. Since costs were probably most important in this phase, but finally an off-the-shelf package would have been cheaper. **More accuracy in the first phase** could have resulted in a better and cheaper system, therefore in the first phase the top management support is negative.

Business plan and vision are created, but did not have the priority which it deserves. It is the backbone of the whole implementation. The company size is probably the underlying reason for overseeing the use of it. During the setting up of the project **nobody has time for writing a complete project plan** and nobody regards this as important, since it is a **small company** everybody should know why decisions are taken. This results in a project where nobody has put effort in thinking about every aspect, with as results that important aspects are simply overlooked. The differentiation between ERP system selection and provider selection has never been made and the team saw the implementation more as a replacement of the old ERP system and not as a method of improving the current business processes and systems. This is a direct result of a **missing vision about the implementation**. The IT-department recognizes this missing, but management thought the project is sufficiently described.

Effective communication did **not occur**. The team didn't have a representative of the administrative employees on board, but a key-user group has been created to communicate with the users of other departments and levels. In practice this **communication was most of the time one way**. This is probably caused by the **Power Distance** within the company. Although management would like to reduce this, the employees see it as positive that the Power Distance exists. This contradicts with an interview of an **employee who wants more influence** bottom up. Finally both management and employees said that the **communication was not sufficient**. This can also be attributed to the **missing of a solid project plan**, which needed to be executed well.

Project management could have been executed better. In this first phase important documents have not been written which has resulted in **misunderstandings between ERP provider and TC**. Management of TC recognized that the project management should have been better executed.

Project champion has executed his task well according to management and IT department, but the employees didn't see anything of it. This means that he **did his job well**, but the **communication to the employees was not sufficient**. But the new system is not received positive by the employees, since it does not solve their problems with the old system. The project champion cannot solve this. Therefore the employees do not reward his job.

Appropriate business and IT legacy systems were positive in the project. The **business climate at TC was stable** according to all participants of the survey. The planning of the inclusion of legacy systems was easy, since no legacy systems where used.

CONTENT

The content of the first phase handles mostly about the goal setting and the ERP-, and provider-selection with the final implementation proposal. These elements will be analyzed below

The Goals which are set for the new ERP system are as follows: the system must be the **same as the current system** but it must include a **better reporting module**. Second it must be able to handle **different business units, warehouses** and in the future **e-Commerce** applications. These are **weak goals** for a new ERP system. The goals are clear, but when a new system is introduced it is the perfect moment to **rethink the business processes**, but as far as the results of the evaluation reach, no attention has been given to this point. For this reason the **goal setting is neutral**.

The ERP and provider selection will be discussed here without a subdivision in ERP system and provider, because TC didn't do that either. TC did **not have the knowledge how to start an ERP implementation project**. The list of demands for the new system is not extensively made up. There is **not made a distinction between an ERP system and provider selection**. So a couple of providers has been approached and delivered a proposal. A **comparison of these proposals has not been found**. Neither were these proposals easy to compare. Even afterwards it is difficult to see if the current provider choice was the best. When looking at the final costs and time of the implementation a different choice could have been better.

Plan presentation was a success. Although the ERP system and provider selection was not executed well, the ERP provider made a **clear and detailed plan for the implementation**. This already included a planning and resulted in a **satisfied management** which was confident in the execution of it.

CONTEXT

The context includes SME and culture elements which will be analyzed below. These elements have influence on the process and content and are therefore an important predictor for the evaluation of the phase.

Extend of Organizational Change and **Company Size** are the SME context elements in the first phase which will be discussed. The company size seems to be large with 120 people of which 50 office employees. But the sales departments are relative large, which means those employees are all having the same procedures. The relevance of **company size** will thus be measured with the number of departments and procedures. This number **is relative small**, which should imply a **relative easy implementation**. The **extent of the organizational change is also small** as the general project leader said that the new system should be almost the same as the old system. The **current internal procedures are working well**, since internal **climate is calm** and the profit numbers are high. The SME-context aspects predict a positive implementation.

The context elements also include a culture aspect, namely 'Masculinity', 'Fatalism' and 'Trust'.

Fatalism is not found in the survey under the employees and management of TC. This means that they are not fatalistic, which is a neutral for the implementation. Now the attitude resembles the western attitude and is it not an extra culture aspect which should be taken into account.

Masculinity is clearly different between management and employees. **Management has a masculine attitude**, but the **employees have a feminine attitude**. On average this resembles the expectation on basis of the results of Hofstede and is **almost the same as in western countries**. But since the employees are not so much involved in this phase the result is

Trust is important in this phase between the ERP provider and TC. Since TC has to share company specific data to let them make a system that totally fit with the organization structure. Both parties know each other **good because the IT department is largely outsourced to the same company which now delivers the new ERP system**. This means the trust relation is positive.

CONCLUSION ANALYSIS PHASE 1

The first phase is negative evaluated, although the context had a positive influence on the process. The weak goals resulted in easy to reach ERP and provider criteria. Looking at the process the preparation of TC and the minimal documentation of the goals, the changes and the possibilities with a new ERP system, the only conclusion that can be drawn is that TC did underestimate the possibilities of an ERP implementation and the far reaching consequences of the system choice. More effort in this phase had result in different system choices and a smoother continuation of the implementation.

5.4.2. PHASE 2: THE PROJECT

This first phase was not successful executed, but resulted in a clear project plan of the ERP provider. As this is the basis for this second phase it can still result in a positive final conclusion. In this second phase the ERP provider needs to make its promises true. Because there are almost no business process changes, thus from the side of TC not many changes are needed.

PROCESS

In the second phase there are a couple of process elements which are also important in the first phase. Only the elements where the analysis is different or needs to be extended have been added in this paragraph, namely ERP teamwork and composition, Top management support and Project management. The new elements will all be discussed.

ERP teamwork and composition could have been better. In the project phase the team changed of composition. Senior management was not part of the team anymore and programmers of the ERP provider joined the team. But this **team did not have experience with building ERP systems**. They **underestimated the project**, because of **dissimilarity between the description of the ERP provider and TC**. This could have been prevented by a strong project plan. When the problems became insuperable, the ERP provider decided to hire an external specialist to help them solve the problems. This finally resulted in a working system, but the **delay of the implementation** was almost more than the original planning.

Top management support is described well in the first phase, although it was negative in the first phase it did everything needed in the other phases. Top management supported the whole implementation and was **always positive to employees** about it. And last but not least all necessary **resources were available** for a sound implementation.

Project management was executed better in the second phase, according to the IT department. The general project leader was not concerned as much anymore. The daily responsibility was transferred to the project manager IT. As planning is also an important part of the implementation the project management was not successful in this phase either. The **delay in the implementation is with doubling the**

original planning too large to accept for good project management. The start situation, when looking at the planning was perfect, but the **project manager did not steer the team well to meet the deadlines**. Besides that he underestimated the project and **called in help too late**. It seemed that he **did not control the project**. Management found the **documentation during the project outstanding**; it was not observed that it was executed which **counter speaks the opinion of management**. The final documentation is excellent according to management. But the IT staff was not satisfied with the results of the documentation they made.

Change management program and culture were not executed from the beginning of the implementation. Management is very clear that **nothing has changed**, only after the implementation some changes has been put through. This is logical, since the planning of TC was to get a new system which resembles the old system without any changes in working procedures or culture. This means this was **done according to the planning**.

Business process redesign and minimum customization are executed as planned. The system has been built to make the **changes as little as possible**. The customization is not relevant at this implementation, since the **whole system is custom build**.

Software development, testing and troubleshooting has been executed in a **non-standard manner**. There was **not a well-documented framework** as basis for the whole ERP system. The system is **modular build**. This would have been the perfect way if a framework exists. But the missing of it resulted in problems when some modules were not planned or more complex than thought on forehand. This resulted in difficult changes and the missing of security issues. Therefore an **external specialist needed** to be hired. The **testing and troubleshooting has been done, well**. They took three months to find the bugs and fix them. In this period the old and new system were running both. Finally a **good working system is delivered**.

CONTENT

The content which needed to be delivered in the second phase is a working system within the organization. This means that there needs to be a fit between the system, organization and technology. Therefore six elements are prescribed and the results at TC will be discussed below.

Detailed project plan was already written in the chartering phase. This plan contained the planning and idea of the ERP provider. This **plan was already extensive**. From this plan a MS Project planning has been made. This was a **good starting point**. Management said that all changes are reported in the project plan, but the IT department denies that. In the observation also **no proof of any updates in the project plan is found**. Only the planning has once been updated after six months. The planning looked impressive, but the IT department did not unanimous validate it. This had been said afterwards and they made the planning.

Team and knowledge seemed to be sufficient, but **halfway the project it was getting complex** and the project manager IT decided that **they needed a specialist** who could help with the security of the system and someone who has a good overview of the total system. When observing the specialist it seems that the **team had missed such a person** from the beginning on. This was the responsibility of the project manager IT.

BPR (Business Process Redesign) was not executed during the project phase. Three departments needed to change as earlier stated, but these departments changed at once when the new system went live. It took a year before everyone was almost used to the new system.

Configuring / Adaptation / Programming At TC the system has been **custom build**, this means that **configuring was no issue** and since the system needed to be built to fit with the organization **no adaptation was needed**. The result is that they only need to program the system. This was more complex

than thought in advance. They expected to work with one or two programmers, finally three were working at the system. The **result was sufficient**, but it took more time and man-hours to get it done. But the time delay is a team and project management issue. The result of programming is sufficient, because the ERP system is functioning according to the set goals.

Legacy systems are no issue at this implementation, since the new system did **not need to work with any other system**. Everything is custom build.

Testing and documenting has been executed. **Management is very satisfied** with the documentation of the system. The training of the staff to use and maintain the system could be much better according to management. The IT department said it has **trained everyone well**. For management an easy negotiating position to get more support. All users agree that the **data has been converted well** to the new system. The system went totally life at January 1st, 2009.

CONTEXT

The context specific elements which are prescribed are **Extend of Organizational Change** and **Company Size**. These have been discussed in the first phase and have their influence on the second phase too, but are not changed. This means that the SME aspects predict a positive second phase.

CONCLUSION ANALYSIS PHASE 2

The second phase is negative evaluated, although the small number of context elements had a positive influence on the process. The implementation process was not well controlled. Planning was not met, the implementation team had not enough technical knowledge, and the project plan was not used well. This resulted in a significant delay in the going-live date. This can be partly subscribed to the negative first phase, but with the good project plan and change of project team members the situation could have been positively changed. The content was mostly positive as the programmers have delivered a working system which did not need to communicate with legacy systems. But because required elements of the process are negative, the final result is negative for phase 2.

5.4.3. PHASE 3: SHAKEDOWN

The new ERP system went live with significant delay. Although the previous two parts are negative evaluated by eEEMSLA, this does not mean that management and the users need to be negative about the net ERP system. In this phase the first period after the going live date will be evaluated according to eEEMSLA.

PROCESS

The process specific elements in this phase are almost all the same as in the second phase, except that the change management and culture needs to be changed, because of a different setting. The Monitoring and evaluation of performance is new in this phase, both will be discussed here.

Change management program and culture did take place when the ERP system went live. Administration, accounting and logistics need to work with the ERP system which they had never done before. This **took almost a year before they were used to the new ERP system** and still some procedures are **daily violated**. The new system has less impact on other departments, because they are more used to working with an ERP system. The conclusion is that the change management and culture is not successful in this phase because the departments where the changes took place are not prepared for the change.

Monitoring and evaluation of performance has been done, but in a **different way than planned** on forehand. An extensive evaluation was planned. But due to the **delay of the project** this

evaluation has been **changed in a two phase evaluation**, partly the evaluation during the implementation and the second part with a survey afterwards. This results in **less data about the third phase** which results in a less extensive evaluation than expected.

CONTENT

The system itself is the main content part of this phase. In the survey a fair amount of questions has been asked about the system quality and information quality.

System quality is the first topic discussed here. The implementation has been positively rewarded by management. They are satisfied with the results, but the period till complete acceptation by the users took longer than planned. When looking at the system quality there are questions about the system itself and about the usability of the system. The results of the employees do almost not make any difference between these groups, but **management sees the system itself as very good**, but the **usability as good**. This is a distinction which is important, because the system cannot be changed but the **usability is an aspect that can be learned**. This complies with the reaction of the general project leader; he is satisfied too. The **employees see the system as just sufficient**. And when looking at the minor details the **usability is a little bit higher rated** than the system itself. This distinction is not as big as the distinction of management. This **opposite opinion of the employees** can be based by the fact that they are in common **more used to using systems** and therefore more **easily learn a new system**. This all result in a positive system quality.

Information quality is a topic where **management and employees do not agree**. **Management value the information quality with the highest score**, while the **employees value it with non-sufficient**. There is one exception with the employees; they say the information is easy to understand. But low-quality information can, as-well as high quality information, be easily understood and thus this question does not say much about the quality of the information itself. The reason for this split in results is that the **management reports are of high quality**, while the **information which needs to be used by the employees is not**; with as result more work for the employees to do their job well and less work for management to do its job. This results in a split conclusion on the element information quality.

The above information should result in an impact on the organization on individual level and thereafter on organizational level.

Individual impact is, according to above results, **expected to be positive for management and negative for the employees**. This is **in line with the results** of the survey. Management reflected it as positive on their personal work and the employees as a little bit negative. As earlier stated the **employees need to do a lot of work to use the system**, which will not have a positive influence on their personal work.

Organizational impact is the final result of the new system at the organization. As this **should also follow from the individual impact** the expectation is that management will say it has a positive influence and the employees will see it as a little bit negative. The survey gives these results as well. **Management is positive**, **except** that the system did **not result in reduced staff costs and no productivity improvement**. These were also **no main reasons for the implementation**, so it would have only been extra if it improved too. The opinion of management about the organizational impact is finally positive. The employees see only the positioning for e-business as positive, **all other elements are rewarded as insufficient.** This is also in line with the expectations of the model, namely the results of the individual impact.

CONTEXT

The context has also an import influence on the implementation and acceptance of the new system. The elements 'Extend of Organizational Change', 'Company Size' and 'Masculinity' have already discussed at earlier phases. But 'Extend of Organizational Change' needs an extra explanation in this phase, since the going live of the system changed this SME aspect. The 'company size' and 'Masculinity' did not change and are still both positive toward the implementation.

Extend of Organizational Change did change. Because first was said that the new ERP system functions the same as the old ERP system, but the survey reveals that the **departments administration, accounting and logistics are new to using a system at all**. This means that the changes are almost non-existing for most departments but the processes at **these three departments will probably change a lot**. This information was received as last, so it was not possible to see how this change has been experienced. Positive is that the starting **situation was stable and healthy**; this has a positive influence on an implementation. But the change from no ERP use to a new ERP system is large. Therefore in this phase the influence is negative.

New culture elements in this phase are 'Particularism', 'Uncertainty Avoidance' and 'Power Distance'.

Particularism has been indicated as important since it has a **negative influence** at the use of **standard procedures** and an **ERP system works best with standard procedures** and in this phase everybody needs to start working with the new system. The survey reveals that the property **particularism is** not **applied** to the management but it is **to the employees**. This could imply **resistance to work with the new ERP system** according to the eEEMSLA model.

Uncertainty avoidance is in general very high in Mexico, see figure 5. A new **ERP system is an unknown new situation** that can cause a **feeling of uncertainty**, which has a negative influence on the use of it. The survey indicated that management has low uncertainty avoidance, but the **employees have moderate uncertainty avoidance**. This does result in a moderate resistance in the use of the new system.

Power Distance **is in general high** in Mexico, **which is positive for the implementation** of a new system, since employees will follow the direction of their boss. The survey indicated that management does want a low power distance and the **employees a high power distance**. Although employees and management are not sharing the same values, it is positive for the implementation. Employees respect the orders from their boss and will try to follow them. The boss will implement the system, thus the power distance is positive.

CONCLUSION ANALYSIS PHASE 3

The process of the third phase is difficult because there are three negative contextual influences, but also three positive. The process of changing the organization to use the new structure took more time than expected. This is partly because three departments, which were not prepared, needed to use the new ERP system at once, without ever using an ERP system before. This took almost a year for these departments to adjust to the new procedures. This could have been prevented when these departments were already prepared in the second phase. But also the new ERP system itself is not everybody hoped for. Management is satisfied with the system, it fits the organization as requested and the management reports are very good. But the Employees whishes have not been implemented in the system and they see the new system only as extra work, without any positive effects for them. The particularistic and uncertainty avoidance qualities of the employees do not work in positive direction. This results in a negative evaluation of the third phase.

5.5. CONCLUSION OVERALL ANALYSIS

The step by step analysis of the previous paragraph will first be displayed in the model with the colors green, yellow and red indicating a respectively positive, neutral or negative execution. At the context part the colors refer not to the execution but at the influence the element had on the implementation, see Figure 7.

PHASE 1: PROJECT CHARTERING

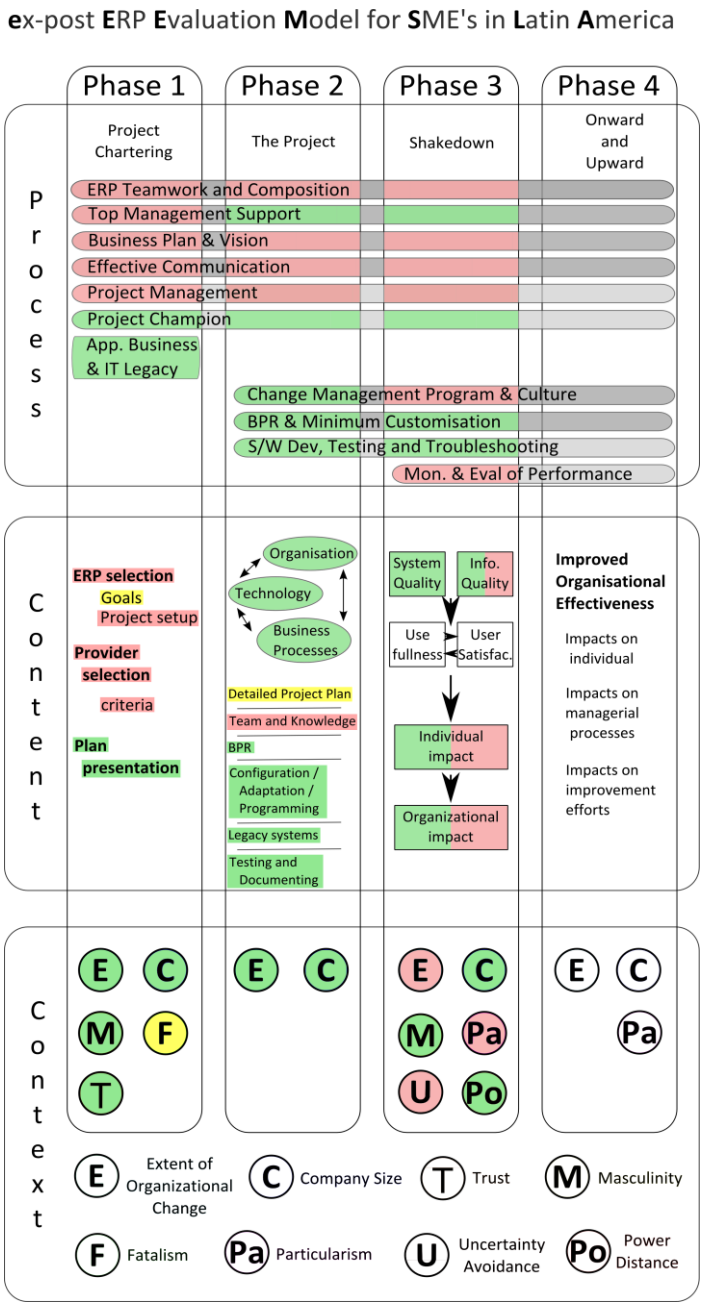


Figure 7 eEEMSLA results of TC evaluation

The first phase of the eEEMSLA model projected on the situation at TC has a positive contextual setting. But the starting of the project was not successful. Because only the secondary elements (light grey in eEEMSLA), like top management support, project champion and appropriate business are done well, but when the team has no well formulated business plan and does not communicate well the conclusion can be drawn that the project management will not be executed well which result in a sub-optimal project chartering. This is also the result of the content phase where only the plan presentation is positive. This is not the result of a well-structured ERP and provider selection process. This process was not well documented and seems to have led to a sub-optimal system choice. But the presentation of the chosen system was well done. According to eEEMSLA this phase is negative evaluated.

PHASE 2: THE PROJECT

The basis for the second phase is the project plan of the first phase, which is well presented and is a good starting position. This whole project is well executed, but the missing of a good ERP team in combination with a poorly documented business plan resulted in an ERP team that finally could not handle the requests of the organization. The team did not have the knowledge needed which resulted in the delay of the project. And because the project plan is not constantly maintained, the team recognized the need for external knowledge late. The contextual factors are also in this phase positive. The result is a too expensive system which fits the organization. Although the content of this phase is mainly positive rewarded, the final eEEMSLA evaluation is negative.

Phase 3: Shakedown

When the system went live in the third phase the whole project was a year delayed. Most employees did not know what to expect, since the communication was at a low level through-out the implementation course. This resulted in an abrupt change of the departments 'administration', 'accounting' and 'logistics', because they were expected to work with the new system. Before the implementation they did not need to work with the system. Especially for these three departments it took nearly a year to adjust to the new system and procedures. But the other departments took also several months to adjust to the new situation. This can be explained in this phase by the low level of communication. The whishes from the employees are not mapped before, so the system is not designed to integrate their wishes. This results in an information supply from the system to the employees which does not meet their wishes and thus does not satisfy. As result the individual impact and organizational impact is less than expected. But for management the system is perfect, the information and the system itself is as requested. That the system is not welcomed by the employees as expected is explained by the context elements. From the six important elements are three negative and three positive. Especially the extent of organizational complexity (the three departments which had to use a system and did this never before) is an important foreseeable negative aspect. When combined with the uncertainty avoidance and the particularistic employees it is logical that the new system did not fit well in the organization with the employees. The final evaluation of eEEMSLA for the third phase is thus negative too.

Final evaluation conclusion

The final overall evaluation of eEEMSLA about the ERP implementation at TC based on the three negative evaluated phases is negative. The implementation has failed. But according to management of TC the implementation has succeeded. This is logical, since the system does meet the requirements set by management in advance. Management recognizes that the implementation of the whole system was far from smooth, but that does not influence the final result. The conclusion of the evaluation of the employees is negative; they have not seen their wishes accomplished in the new ERP system. For them is the new system only more work and uncertain. All this finally results in there negative opinion.

The final conclusion is, based on the conclusion of eEEMSLA, management and the employees, that the ERP implementation at TC failed.

6. CONCLUSION

In this chapter the conclusions of this research will be presented. This will be done following the research questions from paragraph 2.4 which will lead to the final conclusion of the problem statement from paragraph 2.3.

TradCo is a young fast growing company which is specialized in the trading of promotional items. With double digit growth figures it is fast growing, but the ERP system was not build for this size company and needed replacement, since an update was not possible. This study analyzed the implementation of a new ERP system.

The research is set-up to investigate the implementation of a new ERP system at TC. Below the conclusion of this research is presented, therefore the following problem statement was formulated: ***"To which extent was the ERP implementation at TradCo successful?"***

To answer the question about the successfulness of the ERP implementation a model is needed to evaluate the implementation. A search to scientific models for an ERP evaluation in a Latin American country has been performed, but without result. There was no model that could be used which takes the cultural and SME aspects into account. This was reason to develop an evaluation model for Latin America, namely eEEMSLA (ex-post ERP Evaluation Model for Latin America). This model is based on a combination of existing models. The main difference with other models is the inclusion of the context, being culture and SME aspects, in current IT models for ERP evaluations. EEEMSLA does not make use of quantitative measuring methods but is only a descriptive model. This model can be used to evaluate the ERP implementation at TC since it combines the process, content and context elements. With these three building blocks the situation of TC can be evaluated without concessions in any form. This model is finally used to evaluate the ERP implementation at TC.

The empirical data which has been gathered at TC by means of document review, interviews, observation and a survey have been put into eEEMSLA to see on which elements the implementation was positive and where negative. This results in an eEEMSLA overview with the positive, neutral and negative elements highlighted. Based on this figure conclusions about the implementation are drawn. There are negative and also positive elements of the implementation. The first phase was almost completely negative, because the goal setting and the selection of the ERP system and provider has been done without a well-structured business plan. This Results in a custom-build ERP system which is finally very expensive compared with other possibilities. This missing project plan is partly the reason of the lacking knowledge during the second phase. But this can also partly be attributed to the ERP team which could have discovered this knowledge gap earlier. Both are also responsible for updating the project plan, which was done only once, instead of continuously. These two elements resulted in the delay of the implementation of a year. When the system went life management was satisfied with the result, but the employees not. The employees did find the quality of information in the system not sufficient, which can be caused by the almost non existing communication between employees and the ERP implementation team and by the culture aspects which predict resistance to the new system. This resulted non-satisfied employees about the new system.

The evaluation result of eEEMSLA is that the implementation has failed. This is concluded because the three phases of the model are negative concluded. The main reason for the failure of all phases is that the process part was not well executed. The ERP teamwork and composition together with a good project planning was not sufficient executed to get the expected result from an ERP implementation. Management is satisfied with the final result, because the system does comply the goals set by management in the first phase. The employees are not satisfied with the new ERP system, because their problems with the old system were not included in the set goals. This undermines the goal setting of management, as being incomplete. The three conclusions about the evaluation, from eEEMSLA, management and employees, result in the final result that the implementation has failed.

When considered all the results of the evaluation at TradCo a resemblance with implementations of 10 years ago in western countries is found. The classical mistakes are found, such as a denial of the importance of the project plan, not working with a strict planning and a weak goal setting. The implementation is seen as a regular software implementation, which is a huge underestimation of the complexity of the implementation. It is very difficult for a Mexican company to jump over the mistakes which the western world made years ago. It looks like that every country or region needs to reinvent solutions which are common knowledge for other countries and regions.

Recommendations

When reviewing all the elements which have been seen and researched during the writing of this thesis there are a few elements which need special attention to let this implementation be of help for future implementations of ERP systems or information systems in general.

The importance of a well formulated and complete project plan which is updated during the whole process will prevent the organization of missing opportunities and helps in reaching the best solution. This project plan will be the backbone of an implementation and results in the adopting the best people with the right knowledge for the job. If these people communicate well with the organization, to hear what the organization wants and to let the organization hear what is proposed, the implemented system will be better received. These are standard, but important, business rules.

What makes the situation at TC different? The first thing which is noticed is that the management of TC is largely of Dutch origin. Although management can think that they have overcome the cultural differences, it remains important to be continuously aware of these differences, to be sure that culture will not be the reason of a failure. It was not expected that the employees wanted to have more influence on the system design, but it was a result of the interviews. This is an example of a changing culture.

A last interesting issue is inter-organizational trust. When can two companies trust each other? At the ERP implementation TC and the ERP provider trusted each other, which resulted in less documentation. But without trust the deal would never have been made. But in a trust relation nobody knows exactly what is agreed, unless all the arrangements are documented in detail. This will ensure both parties will know exactly what can be expected, because neither side will break the trust relation by breaking a contract or launching an unjust reproach.

Final notes about eEEMSLA

After applying eEEMSLA some details have been noticed that needs to be researched for a better application of eEEMSLA next time. In phase 2 there are no culture elements used. This is developed because the custom building of the system did not involve many changes. But when using a standard ERP packaged solution, many changes are needed in the second phase. In that case culture comes in as an important element in the second phase too.

In the third phase the questioning about the system quality and information quality might be replaced by questioning about the usefulness and user satisfaction. These two elements can be better measured, than the system quality and information quality. When the answers about the usefulness and user satisfaction are negative, the source of this negativism will be the system quality and information quality. Scientific research to this opposite reasoning is necessary for implementation of this change.

The judgments of the aspects in eEEMSLA are based on qualitative interpretations of the results. This means that these judgments are dependent of the interpreter and would not always be judged in the same way. To make these judgments reproducible, there need to be a norm for every aspect to which the result can be measured. Then eEEMSLA could also be used to compare different evaluations without subjectivity problems.

For application of this model in other Latin American countries than Mexico, the culture elements need to be reviewed. Further application of this model should reveal the consistency and value of it.

7. List of figures and tables

7.1. Figures

Figure 1 Research model in chronological order 10
Figure 2 Framework eEEMSLA model 14
Figure 3 Enterprise System Experience Cycle (Markus & Tanis, 2000) 15
Figure 4 I/S succes model with in red the alteration of Seddon and Kiew (DeLone & McLean, 1992) 19
Figure 5 Hofstede comparison chart (Hofstede G.) 24
Figure 6 Organization chart TC 42
Figure 7 eEEMSLA results of TC evaluation 56

7.2. Tables

Table 1 Reasons for Evaluations (Russ-Eft & Preskill, 2001) 12
Table 2 Questions for Generating Lessons learned (Patton, 2001) 12
Table 3 Process segmentation according to different authors 15
Table 4 CSF's for an ERP system (Fui-Hoon Nah, Lee-shang Lau, & Kuang, 2001) 16
Table 5 ERP selection methodology of Chiesa 17
Table 6 Definitions of the Hofstede Dimensions (Hofstede & Hofstede, Culture and organizations, 2005) 25
Table 7 Influence of culture at IT implementations 26
Table 8 ERP Evalution Model for SME's in Latin America (eEEMSLA) 30
Table 9 Comparision EEEMSLA vs. TC requirements 31
Table 10 EEEMSLA with sources as rectangles 33
Table 11 Remarkable outcomes of the survey 48

8. REFERENCES

Ayyagari, M., Beck, T., & Demirgüç-Kunt, A. (2003). *Small and Medium Enterprises across the Globe: A new Database.* Working Paper, World Bank.

Ball, D. A., McCulloch, W. H., Geringer, J. M., Minor, M. S., & McNett, J. M. (2008). *International Business: The Challenge of Global Competition.* Ney York: McGraw-Hill.

Bedel, M., & Floyd, B. (2006). Top 10 lessons learned from implementing ERP/E-business systems in academic programs. En M. G. Adams, & A. Alkhafaji, *Business Research Yearbook: Global Business Perspective* (págs. 458-463). Maryland: The International Academy of Business Disciplines.

Bingi, P., Sharma, M. K., & Godla, J. (1999). Critical Issues affecting an ERP implementation. *Information Systems Management*, 7-14.

Botta-Genoulaz, V., Millet, P. A., & Grabot, B. (2005). A survey on the recent research literature on ERP systems. *Computers in Industry*, 510-522.

Buonanno, G., Faverio, P., Pigni, F., Ravarini, A., Sciuto, D., & Tagliavini, M. (2005). Factors Affecting ERP system adoption; A comparative analysis between SMEs and large companies. *Journal of Enterprise Information Management*, 384-426.

Chiesa, F. (2004). Methodología para selección de sistemas ERP. *Reportes Técnicos en Ingeniería de Software, 6*(1), 17-37.

Cooper, R. B., & Zmud, R. W. (1990). Information technology implementation research: A technological diffusion approach. *Management Science, 36*(2), 123-139.

Dawar, N., & Frost, T. (1999). Competing with giants: Survival Strategies for Local Companies in Emerging Markets. *Harvard Business Review, 77*(2), 119-129.

DeLone, W. H., & McLean, E. R. (1992). Information systems success: The quest for the dependent variable. *Information System Research, 3*(1), 60-95.

Devos, G., & Buelens, M. (2003). *Openness to organizational change:the contribution of content, context, and process.* Gent: Vlerick Leuven Gent Management School.

Fui-Hoon Nah, F., Lee-shang Lau, J., & Kuang, J. (2001). Critical factors for successful implementation of enterprise systems. *Business Process Management Journal, 7*(3), 285-296.

Gable, G. G., Sedera, D., & Chan, T. (2008). Re-conceptualizing Information System Success: the IS-Impact Measurement Model. *Journal of the Association for Information Systems*.

Geurts, P. (1999). *Van probleem naar onderzoek.* Bussum, Netherlands: Uitgeverij Coutinho.

Govindaraju, R. (2002). *Effective enterprise systems implementation, case studies in Indonesian organisations.* Enschede, The Netherlands: Grafisch Centrum Twente.

Hofstede, G. (1980). Motivation, leadership, and organization: Do American theories apply abroad? *Organizational Dynamics, 9*(1), 42-63.

Hofstede, G. (January de 1984). Cultural dimensions in management and planning. *Asia Pacific Journal of Management*, 81-99.

Hofstede, G. (n.d.). *Geert Hofstede Cultural Dimensions Explained*. Retrieved September 7, 2009, from Geert Hofstede™ Cultural Dimensions Mexico: http://www.geert-hofstede.com/hofstede_mexico.shtml

Hofstede, G., & Hofstede, G. J. (2005). *Culture and organizations: Software of the mind.* New York, NY: McGraw-Hill.

Huang, Z., & Palvia, P. (2001). ERP implementation issues in advanced and developing countries. *Business Process Management Journal*, 276-284.

Kumar, V. (2003). An investigation of critical management issues in ERP implementation: emperical evidence from Canadian organizations. *Technovation, 23*(10), 793-807.

Legris, P., Ingham, J., & Collerette, P. (2003). Why do people use information technology? A critical review of the Technology Acceptance Model. *Information and Management*(40), 191-204.

Lin, H., Hsu, P., & Ting, P. (2006). ERP Systems Success: An Integration of IS Success Model and Balanced Scorecard. *Journal of Research and Practice in Information Technology, 38*(3), 215-228.

Maranto-Vargas, D., & Gómez-Tagle Rangel, R. (2007). Development of internal resources and capabilities as sources of differentiation of SME under increased global competition: A field study in Mexico. *Technological Forecasting & Social Change*(74), 90-99.

Markus, M. L., & Tanis, C. (2000). The enterprise system experience - From adoption to success. En R. Zmud (Ed.), *Framing domains of IT management: Projecting the future through the past* (págs. 173-207). Cincinnati: Pinnaflex Educational Resources inc.

Osland, J. S., Franco de, S., & Osland, A. (1999). Organizational implications of Latin American culture, Lessons for the expatriate manager. *Journal of management inquiry, 8*(2), 219-234.

Parr, A., & Shanks, G. (2000). A model of ERP project implementation. *Journal of Information Technology, 15*, 289-303.

Patton, M. Q. (2001). Evaluation, Knowledge Management, Best Practices, and High Quality Lessons Learned. *American Journal of Evaluation, 22*(3), 329–336.

Rao, P., & Teegen, H. (2001). Human Resource Issues : US-Mexico Joint Ventures. *The 2001 IberoAmerican Acadamy of Management.* Mexico City.

Rosenbrand, M. E., Dirks, F. R., & Meijaard, J. (2003). *Kansrijker door samenwerking; Kenmerken en en resultaten van samenwerking van kleine ondernemingen.* Zoetermeer, The Netherlands: Raad voor zelfstandig ondernemerschap.

Russ-Eft, D., & Preskill, H. (2001). *Evaluation in Organizations; A systematic approach to enhancing learning, performance, and change.* Cambridge, MA, USA: Basic Books.

Seddon, P. B., & Kiew, M.-Y. (1996). A partial test and development of DeLone and McLean's model of IS success. *Asian Journal of Information Systems, 4*(1), 90-109.

Soh, C., & Markus, M. (1995). How IT creates business value: a process theory. *Proceedings of the 16th International Conference on Information.* Amsterdam, The Netherlands.

Stephens, G. K., & Greer, c. R. (1995). Doing business in Mexico: Understanding cultural differences. *Organizational Dynamics, 24*(1), 39-55.

Teltumbde, A. (2000). A framework for evaluating ERP projects. *International Journal of Production Research, 38*(17), 4507-4520.

Triandis, H. C., Lisansky, J., Marín, G., & Betoncourt, H. (1984). Sympatía as a cultural script for Hispanics. *journal of Personality and Social Psychology, 47*(6), 1363-1375.

Trompenaars, F., & Hampden-Turner, C. (1998). *Riding the waves of culture: Understanding diversity in global business* (2nd ed.). New York, NY: McGraw-Hill.

Zhou-sivunen, P. (2006). *Organizational culture impact in ERP implementation in China.* Master of Science Thesis, Hanken School of Economics, Accounting, Helsinki.

Zmud, R. W., & Apple, L. E. (1989). Measuring Information Technology Infusion. *Unpublished Manuscript.*

9. APPENDIX A: EEEMSLA SURVEY AT TC

(If a cell is grey, the question has not been asked to the corresponding group)

Results:

Survey questions part 1		Totally disagree	disagree	agree	Totally agree	*n=1*	*n=1*	*n=4*
No	**Question**					Managmnt	IT-dep	users
1	The high maturity of TC with ERP systems resulted in a smooth implementation of the new ERP system	1	2	3	4	2	4	
2	Existing business processes are integrated in the new ERP system in order to create competitive advantage	1	2	3	4	4	3	2¼
3	Most business processes have been redesigned for the implementation of the new ERP system	1	2	3	4	2	3	
4	The ERP implementation team had enough knowledge about the business processes to build the new ERP system	1	2	3	4	4	3	2
5	The ERP implementation team had enough technical knowledge to build the new ERP system	1	2	3	4	3	4	
6	Top management supported the complete implementation of the new ERP system in all aspects	1	2	3	4	4	3	2¾
7	The whole ERP implementation project (including strategic benefits, tangible benefits, resources, costs, risks, timeline, etc.) has been described in a project plan	1	2	3	4	3	2	
8	The ERP implementation project has been well communicated from the beginning to the end of the implementation	1	2	3	4	2		2
9	The ERP implementation project is managed well	1	2	3	4	2	3	
10	Every change of plan is documented in the project plan	1	2	3	4	4	2	
11	The project champion took all obstacles away and made the organization ready for a smooth transition to the new ERP system	1	2	3	4	3	3	1¾
12	Before the implementation of the ERP system started TC had a calm and healthy atmosphere	1	2	3	4	4	3	3¼
13	The corporate culture changed during the implementation of the ERP system	1	2	3	4	1	3	2¼
14	The delivered new ERP system meets the quality requirements set in advance	1	2	3	4	4		
15	Staff is trained well to maintain the new ERP system	1	2	3	4	2	4	
16	All Organizational changes are described in de project plan before the implementation of the new ERP system started	1	2	3	4	2	3	

17	The ERP implementation project has been well documented during the implementation	1	2	3	4	4	3	
18	All existing data is converted to the new ERP system	1	2	3	4	3	2	2¾
19	The new ERP system enhances my effectiveness in the job	1	2	3	4	3		2¼
20	The new ERP system decreases my productivity	1	2	3	4	1		2¾
21	The new ERP system is cost effective	1	2	3	4	4		
22	The new ERP system has resulted in reduced staff costs	1	2	3	4	2		
23	The new ERP system has resulted in cost reductions (e.g. inventory holding costs, administration expenses etc.)	1	2	3	4	3		
24	The new ERP system has resulted in overall productivity improvements	1	2	3	4	2		2½
25	The new ERP system has resulted in improved outcomes or outputs.	1	2	3	4	3		2¼
26	The new ERP system has resulted in an increased capacity to manage a growing volume of activity (e.g. transactions, populations' growth, etc.)	1	1	2	3	4		2¾
27	The new ERP system has resulted in improved business processes	1	2	3	4	3		2¾
28	The new ERP system has resulted in better positioning for e-Business	1	2	3	4	4		3
29	The new ERP system provides output that seems to be exactly what is needed	1	2	3	4	3		2
30	Information needed from the new ERP system is always available	1	2	3	4	4		1¾
31	Information from the new ERP system is in a form that is readily usable	1	2	3	4	4		2¼
32	Information from the new ERP system is easy to understand	1	2	3	4	4		3¼
33	Information from the new ERP system is concise	1	2	3	4	4		2½
34	Information from the new ERP system is always timely	1	2	3	4	4		2¼
35	Data from the new ERP system is current enough	1	2	3	4	4		2½
36	The new ERP system is missing key data	1	2	3	4	1		3
37	The new ERP system is easy to use	1	2	3	4	3		3
38	The new ERP system is easy to learn	1	2	3	4	3		3½
39	The new ERP system meets the departments requirements	1	2	3	4	3		2¼
40	The new ERP system is always up and running as necessary	1	2	3	4	4		2¼
41	The new ERP system responds quickly enough	1	2	3	4	4		2½
42	All data within the new ERP system is fully integrated and consistent	1	2	3	4	4		2½
43	The new ERP system can be easily modified, corrected or improved.	1	2	3	4	4		3

				Results		
Survey questions part 2				*n=1*	*n=1*	*n=4*
No	**Question**	**1**	**2**	Managmnt	IT-dep	Users
1	The complete team validated the time planning before the start of the implementation of the new ERP system (1); the complete team did not validated the time planning (2)	1	2	2	1	
2	Do you prefer to get compensation in monetary rewards, status, recognition, and promotions in proposition to the achievement of ideals (1); or to seek a cooperative work climate, security, and overall job satisfaction (2)	1	2	1	1	2
3	Do you prefer to judge a decision against potential rewards, flexibility, and innovation (1); or to consider a decision lead to high anxiety, and thus use mechanisms that offer a hedge against uncertainty (2)	1	2	1	1	1½
4	Do you prefer to have greater participation between management and employees (1); or to have restricted interaction between management and employees (2)	1	2	1	1	1¾
5	Do you judge “good” and “right” to universal applied rules (1); or do you judge “good” and “right” to rules which are dependent of the situation (2)	1	2	2	1	2
6	Do you believe in fate (1); or do you belief you have influence in the future (2)	1	2	2	2	2

(If a cell is grey, the question has not been asked to the corresponding group)

(If a cell is grey, the question has not been asked to the corresponding group)

Survey questions part 3		Answers					
No	**Question**	**Man 1**	**IT 1**	**User 1**	**User 2**	**User 3**	**User 4**
1	Describe the ERP system used to support the process in the organization, prior to the implementation of the new ERP system.	Inventory management system with restrictions linked to non-inventory processes. (Picking list and invoice had to be generated to be able to take merchandise		Es un sistema fácil, pero son muchos pasos para solo un pedido.	Es un buen sistema pero lo falta ser un poco más amigable, en cuanto a un manejo más ágil del mismo.	se hace más laborioso por la cantidad de pantallas que existen y que tienes que abrir para poder generar un pedido (en el caso de ventas)sobre todo porque el clientes tan en el momento y hay que atender de forma inmediata el	No answer provided.
2	What was the expected timeline for the complete implementation and what was the realized timeline of the implementation?	18 months28 months	The Timeline over 1 year; the realized timeline 3 year.				
3	Are all departments included in the new system? If not, which are missing?	Not included are design & human resources.	Diseño / Design is not included	yo considero que falta crédito y cobranza	Faltaría agregar recepción, mensajeros	no están incluidos todos falta tráfico (extracciones fiscales) y compras (mercancía por llegar)	Design department
4	Which business processes were planned to be incorporated into the new ERP system at the time of selecting an ERP system?	sales and inventory movements; as well as all related financial movements					
5	How many providers have been selected to inquire more information about ERP systems?	No answer provided.					

Survey questions part 3 (continue form previous page)		Answers					
No	**Question**	**Man 1**	**IT 1**	**User 1**	**User 2**	**User 3**	**User 4**
6	What were the selection criteria for the ERP system?	Flexibility to adapt to the business and cost					
7	Which systems have been chosen to evaluate in greater detail?	Due to cost considerations it was cheaper to make something					
8	What were the selection criteria for the provider of the ERP system	Cost; experience; and knowing the provider from other projects					
9	Which changes in hard technology were required for the ERP implementation?	Upgrading workstations to a min of 2G memory and windows2000	New Computer for some users; new printer for some areas.				
10	Were there differences in the introduction of the new system in different business units? If so, what were the differences?	Sales and inventory modules had little change. Administration and accounting units were not incorporated in a system before					
11	Describe the new ERP system in your own words	A much needed actualization to more current programming; providing the possibility to link to other programs; exporting data and to bridge to web based	Designed in New Technologies (Microsoft .Net). With possibilities to developer in the future	Un sistema que permita ver todos los movimientos realizados por producto y por cliente.	Se trata de un buen sistema al cual se le puede explotar más, ya que le falte más información y adecuaciones para ser completo.	es útil porque están establecidos varios parámetros que no se consideraban antes y con ello ayuda a llevar un control mejor	A system where all movement of stock products is monitored and managed, simplifying various processes in daily work, making clear reports and easy to use for the whole company