CityUniversity
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**THE MATURITY LEVEL OF THE PROJECT MANAGEMENT
IN E-COMMERCE PROJECTS IN GREECE.**

By

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**A THESIS REPORT
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In Partial Fulfillment of the Requirements
For the Degree of
MASTER OF SCIENCE OF PROJECT MANAGEMENT**

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Dedication

To my family and
my friend, Kostas
the most important project of my life.

BIOGRAPHY

Ilias K. Filias

Hlias Filias has finished his postgraduate studies in the T.E.I of Lamia, in the faculty of technological applications the department of Information Technology and Technology of computers. The title that was attributed to him is of an engineer of computers.

Hlias Filias is occupied as a technician of computers and networks. Also, he works as a web developer and is the webmaster in lots of web sites as well as in entire e-commerce projects. This year he is occupied as a teacher in Centres of Professional Training and the cognitive object which teaches is programming and electronic applications.

The projects that Hlias Filias runs, the most times are complicated and also they last a lot of time for their completion. Finally, he is interested a lot in the science of Information Technology as well as in the research and the betterment of his work.

Abstract

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THE MATURITY LEVEL OF THE PROJECT MANAGEMENT, IN
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The short space time that an organization has sometimes makes it difficult to adopt a specific e-commerce project management methodology. Sufficient time is required, adequate financial support and human resources with skills in order to make a start with a comprehensive methodology. It is, however , often more suitable that a maturity model is used so as to move from one maturity model to the next.

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A good evaluation of the maturity level of an organization provides a good benchmarking tool for rating the success of its operations. An exercise like that was carried out in South Africa in 2003, and the general average project management maturity was found to be 2.92 (Sonnekus & Labuschagne, 2004) on a scale of 1 to 5. The success rate of the projects was linked closely with the maturity level.

In this paper we report an exercise that is similar to this and is conducted in Greece regarding the level of maturity of e-commerce projects. The average level of maturity of e-commerce companies in Greece can give us a useful indication of, amongst others, the status that exists now in the software project management with a view to bring about improvement in this sector.

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Chapter 1 – Introduction

1.1 Nature of the Study

In the current era the e-commerce gains more and more acceptance in the Greek reality, not so much in applications but as a new pioneering way of trade. E-Commerce projects are big projects, where involves very big human potential and budgets. So there always exists the fear of failure and success, consequently all risks are taken. For all the previous we understand that the need of project management in these projects is imperative.

In Greece the e-commerce projects starts to grow, consequently there is interest that they deal with the directives and standards of project management. The project management came to help the e-commerce projects and these of course have the need project management.

In Greece this form of trade is no developing process this moment, consequently there is a lot of interest to see how much is assimilation of project management in Greek companies that deal with e-commerce.

1.2 Needs Assessment

The e-commerce projects are from their nature very complicated projects, consequently there are many stakeholders that participate.

This thesis will provide stakeholders with:

- Programmers and persons in charge of design and maintenance of the website (Web Designer, Web Developer)

- Customers

- B2B, and other companies

- Managers

- Project Manager

- Sales department

In an e-commerce project there are many stakeholders, something that gives a lot of advantages in the growth of such a project. Because the target group that is addressed to, is wider and we are evolving with different types of persons, as well as for variety of people. Besides, the parallel growth of B2B e-commerce brings important result and full of hope for the e-commerce application in Greece.

1.3 Purpose of the Study

The author believes that through research and interviews (qualitative research), we will discover the situation that exists now in the Greek e-commerce projects, and the maturity level of Project management in these projects. The research will give us answers in the question for which type of project management and in which degree the administration determined her project.

1.4 Employment Position

My name is Filias Elias and I am a graduate of "Information Technology and Technolonogy of Computer" of Technological University in Lamia Greece the year 2006, with the title of a computer engineer.

I have been occupied as a system administrator and network administrator in an internet cafe.

The past 5 years I am occupied in web design and development of web sites and portals. My role in this workgroup is the design and the develop of a web site, and also the programming of complicated web applications (projects). An example of a complicated web application is the development and the maintenance of an e-shop.

The e-commerce in Greece after the raise of the user of internet in this country, has begun a ascendant course and gains always more new investors. Observing an e-shop as a completed e-commerce project, we understand that this is a project that must have the study of the methods of the Project management.

To project management helps decisive in e-commerce projects so that they have a successful result.

Having some experience in the sector of e-commerce, in my final thesis I decided to deal how much the project management has been included in the Greek reality in e-commerce projects. The research for what's going on here today in the Greek e-commerce projects will give answers on maturity level of e-commerce projects in Greece.

1.5 Relation to the Program of Study

In our daily life, everything are a Project. The role of Project management is decisive for the success of the project.

In Pm501 (Introduction to Project Management), we learned all those tools and the phases of a project below the guidance of project management.

Because of the collectively and as well as the basic elements of Project management, is the suitable for this concrete thesis, so that results come out for the maturity level of the e-commerce projects.

Chapter 2 – Problem Statement

2.1 Problem Statement

The problem is a lack of understanding regarding the percent of project management integration in Greek e-commerce projects, and the how this helps in the evolution, in the excellixis and in its success.

As part of this process, the author will take into consideration several large and successful e-commerce projects and will address questions regarding the maturity level, the percentage the project management plays a factor in the project lifecycle and how and in what way these two factors help in the success of projects. As a result of this study, several E-commerce projects in Greece will be categorised using a ranking System.

2.2 Rational

In Greece's current era exists a tendency in the growth of the e-commerce projects. Such types of Projects are the future, if we contemplate the rapid increase of Internet users in the country.

One effective project management is interwoven with the success of the entire project, after the techniques and the rules that are ordained make the project to achieve also in his three main points, that is to say in to his time, according to the budget as well as with best quality.

The level of maturity of Project management in the Greek e-commerce projects is decisive so that befalls the success of a project.

The project management as new decisive factor in the Greek reality helps in successful completion projects. The three basic factors, time, cost and performance lead with the better possible results.

Many e-commerce projects fail because of improvisation and not good organisation. The rules project management come to give the solution, having the project planned the risk management. Following all these rules the success it is easy to befall.

2.3 Objectives - Hypothesis

Our research hypothesis will therefore be:

> Hypothesis: The maturity level in project management techniques followed in ecommerce projects is the discriminating factor in the success of the project.

2.4 Thesis Overview

This thesis consists of six chapters.

Chapter 1 gives an introduction to the general topic.

Chapter 2 includes the problem statement, the rational of the thesis, as well as the objectives of the thesis.

Chapter 3 is a review of the literature related to PM process maturity

and its correlation with organizations' project success.

Chapter 4, the methodology of our research is described in detail.

The result of the large-scale PM process maturity assessment is presented

in chapter 5. The results are analyzed and major findings pointed out.

In chapter 6, we draw the conclusions from this study and recommend further steps.

Chapter 3- Review of the Literature

Introduction.

The Literature Review constitutes an important piece of this thesis. The author drew up this piece with articles from scientific magazines, articles from internet sources as well as from official bibliography. The Literature Review constitutes from three basic pieces:

1) The project management in e-commerce.

2) Project Management Maturity Models

3) Project Success in Project Management

3.1. The project management in e-commerce.

3.1.1 E-commerce in Greece.

According to a unique comparative study by a Company of Advisors Strategic International SA, the B2C electronic commerce in Greece only constitutes the 0.024% of the total of retail sales, while it does not exceed the 0.4% in the United States that is considered the protagonist in the particular space.

In the study, it is inter alia stressed that the dream of the fast and easy profit finished. The laws of the market of Old Economy are also in effect for the New Economy and the companies should turn in them and invest in the long term drawings. They owe to focus their efforts in the cleansing and their profitability as well as in the guarantee of added value in the products and their services. The

Information Technology should be used for the increase of efficiency, the better service of customers, the reduction of cost and the most optimal use of inner company information.

But as Bill Gates paraphrased the known utterance of Winston Churchill "This is not the end. It is not even the beginning of end. Perhaps it is the end of beginning".

3.1.2 Project management progress in e-commence projects.

A software related business risk its face changed when it imports the use applications of e-commerce. The developers of these e-commerce applications may also be presented a corresponding change in the risks they confront.

Particular repercussions in a business exist if overlooked changes in software projects risks are involved. Initially, on systems development literatures and e-commerce, the analysis draws the determination of the differences between traditional projects of development and e-commerce development projects. The traditional projects and the e-commerce were found different in four areas of interest. There were changes in the methods and in the development process, also in the development process outcomes, the stakeholder groups were different and changes were existed in the requirements of the determining application. Secondly, these differences are analyzed against the extracted software project risk factors from a recent reliable study. Each one of the risk factors was influenced in some way. Certain of these effects are presented to be provisional, while others are presented particularly - depended from the individual circumstances of the organization that undertakes the project. Certain risks, nevertheless, were presented to be increased permanently or decreased, pointing out accordingly a fundamental difference in the overall profile of

risk of e-commerce projects when they are compared with the traditional ones. If the effects are provisional, based on the contact or permanent, they all have the repercussions in the way in which risk in projects of e-commerce software is evaluated and regulated. (Kenneth J. Stevens, Greg T. Timbrell, 2003)

3.2 Project Management Maturity Models.

Maturity models are useful as objective scorecards to measure and track the progress.

The author presents the common maturity models:

- o Project Management Maturity Model (PMMM) – Kerzner
- o Capability Maturity Model Integration (CMMI) – SEI
- o (PM)^2 Maturity Assessment Methodology Organizational
- o ESI International's Project Framework – ESI
- o MicroFrame's Self Assessment Tool

The best model is the one that can easily be associated with the real needs of the company – organization.

3.2.1 Kerzner's Project Management Maturity Model.

The International Institute for Learning (IIL) and Harold Kerzner see the project management as an important competency that lots of companies should follow in order to stay competitive in their market. In this opinion, the project management

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maturity models are a strategic tool of major importance (Kerzner,2001) that allows

an organization to measure its capabilities for the project management with its

competitors. Like that, an assessment model for the project management maturity is a

means of establishing a project management excellence that is considered a condition

for success.

Like (PM)2 and CMM, the Kerzner's maturity model defines the five levels

using the lack of project management processes to continuous improvement in order

to rank the organization. These five levels are shown in figure 1 and are shown in

details in the following (Kerzner, 2001):

Level 1 – Common Language The organization recognizes the importance of

project management and the need for a good understanding of the basic

knowledge on project management.

Level 2 – Common Processes At his level, the organization recognizes that

common processes need to be defined and developed so that project success

can be repeated.

Level 3 – Singular Methodology The organization defines a single methodology

for project management in order to take advantage of the associated

synergistic effect.
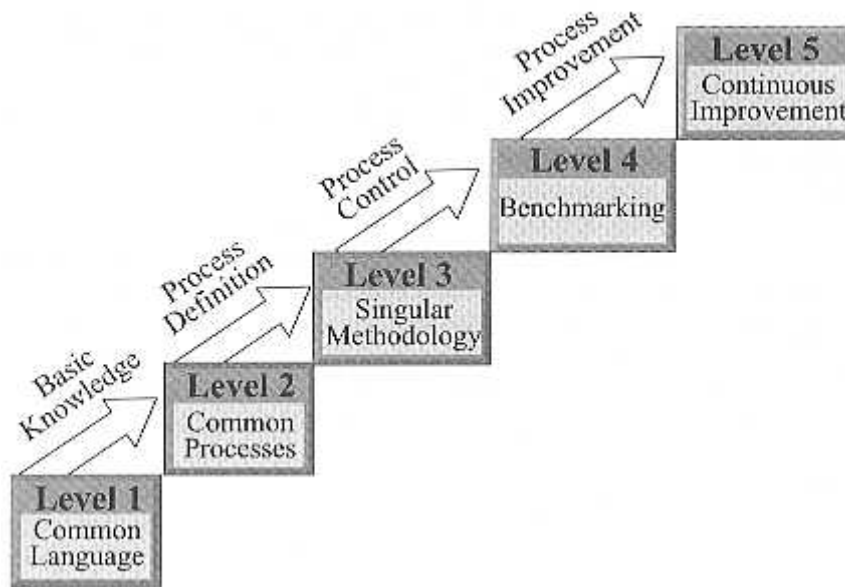
Figure 1 Kerzner's Maturity Levels (Kerzner, 2001)

Level 4 – Benchmarking the organization recognizes that process improvement is necessary to maintain competitive advantage.

Level 5 – Continuous Improvement At this level, the organization evaluates the information obtained through benchmarking and decides how to improve its processes.

The questionnaire is explained in the book of Kerzner about PM maturity models (Kerzner, 2001). Multiple choice is the structure of the questions, where the respondent selects the answer so that his current situation to be the most closely described, a lot alike the $(PM)^2$ questionnaire. This assessment for project management maturity is also given as an electronic assessment tool on the Internet that is able to be licensed by organizations through IIL.

3.2.2 SEI's Capability Maturity Model (CMMI).

The framework that shows the key elements of an effective software development process (Paulk, Weber, Garcia, Chrissis, & Bush, 1993) is the Capability Maturity Model (Paulk et al., 1993) of SEI. The thorough description of this framework makes it a very good theoretical starting point for the develop of process maturity models in other areas (such as project management). The authors describe us a step-by step process for the deriving of key practices that can be transformed into much focused questions.

Maturity levels for which process capabilities are described are the start of this process. The question is: "What are the distinguishing capabilities that an organization has when it is at the maturity level X?". After these capabilities are described, the key process areas are determined, accompanied with the goals that are achieved by the use of these process areas. In the next step, the common features that characterize the successful implementation of these areas of process are determined. Finally, key practices that show us this successful implementation of the common features, i.e. activities that are performed or infrastructure that us in place, are described. In the final step, in order to determine the presence of the key practices, the formulation of questions that have to be asked is a relatively simple. (Schiltz, S. J.(2003).

The CMM defines the five levels of the maturity process, these are very similar to those of the $(PM)^2$ model. The maturity levels are portrayed in the figure 2 The levels (for software development) are defined as follows (Paulk et al., 1993):

Level 1 – Initial Level. The organization does not provide a stable environment for software development. Project success depends on having good software managers or teams.
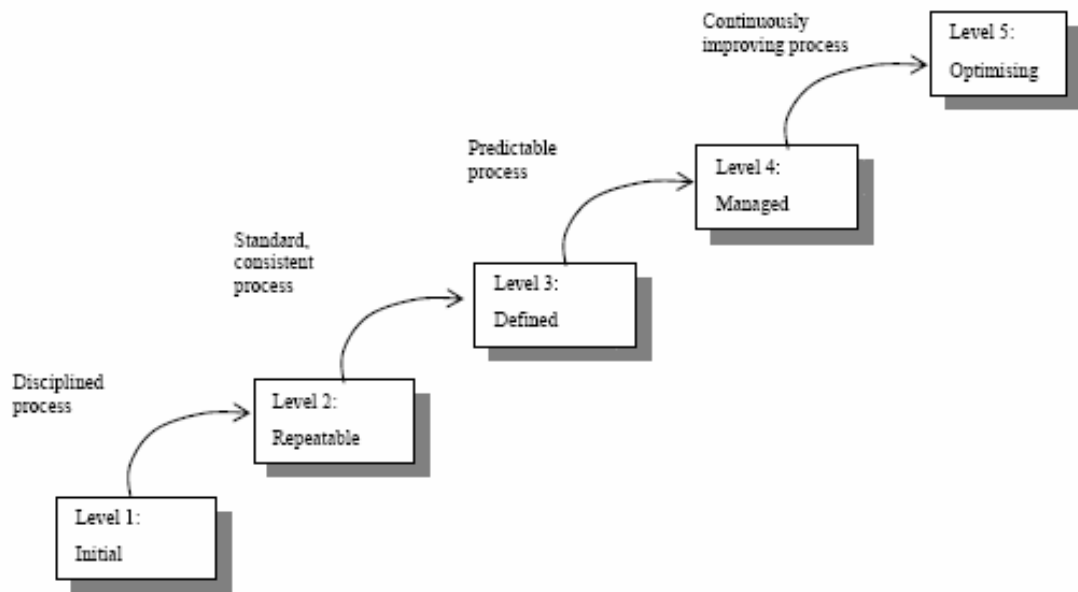
Figure 2 CMM Maturity Levels (Paulk et al., 1993)

Level 2 – Repeatable Level. At the repeatable level, the organization establishes

basic guidelines for managing the software project and its various

procedures.

Level 3 – Defined Level. The organization has a formally documented standard

process for developing and maintaining software engineering and management.

Level 4 – Managed Level. At the managed level, the organization sets quantitative

goals for both software products and processes. They have a predictable

process.

Level 5 – Optimizing Level. The entire organization is focused on continuous

process improvement. Software processes are evaluated to prevent known

types of defects from recurring and lessons learned are spread to other

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projects.

A CMM example questionnaire is also accessible in (Zubrow, Hayes, Siegel, & Goldenson, 1994). The CMM questionnaire provides the respondent with four options throughout: 'yes', 'no', 'does not apply', and 'don't know', contrary to the (PM)2 questionnaire that is asking the respondent to select the situation description that is the closest to what can be found in his organization. The type of questions in the CMM questionnaire allow more distinct answers with less space for interpretation. Consequently, less the support is required for the respondents.

3.2.3 ISO/IEC Software Process Assessment.

In the SPICE project an international standard has been developed for a framework to evaluate the software process, which started in 1991. This approach evaluates the software processes of an organization against the baseline practices in order for the potential capabilities of a process to be determined and to propose an improvement in the process, as portrayed in figure 3. The evaluation tool (questionnaire) in not a part of the standard, but only the guidelines of the construction. This model defines six maturity levels: It adds the "Level 0 – Not Performed Level" to the other five levels that are in other process maturity models (SPICE Project, 1995):

Level 0 – Not-Performed Level There is general failure to perform the base practices in the process. There are no easily identifiable products or outputs of the process.

Level 1 – Performed Informally Level Base practices are generally performed, but may not be rigorously planned and tracked. Performance depends on individual knowledge and effort.
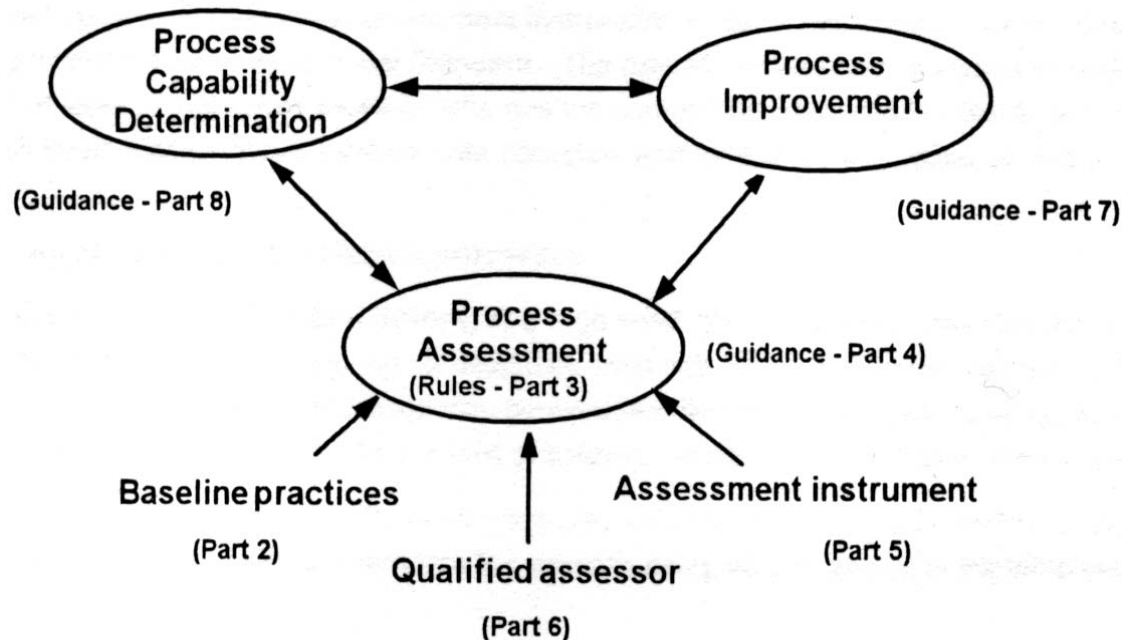
Figure 3 ISO/IEC Software Process Assessment (SPICE Project, 1995)

Level 2 – Planned-and-Tracked Level Performance of the base practices is planned and tracked. Work products conform to specified standards and requirements.

Level 3 – Well-Defined Level Base practices are performed according to a well-defined process using approved, tailored versions of standard, documented processes.

Level 4 – Quantitatively-Controlled Level Detailed measures of performance are collected and analyzed. This leads to a quantitative understanding of

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process capability and an improved ability to predict performance, which
is objectively managed.

Level 5 – Continuously-Improving Level Quantitative process effectiveness
and efficiency goals for performance are established, based on the business
goals of the organization. Continuous process improvement against these
goals is enabled by quantitative feedback from performing the defined processes
and from piloting innovative ideas and technologies.

The similarity of the approaching in order for identification of the process
capabilities that has to be present at the different maturity with the one that is
described in SEI's CMM is not a surprise. This is because several people were
involved in these initiatives.

3.2.4 (PM)^2 Maturity Assessment Methodology.

Professor William C. Ibbs formed a research team at the University of
California at Berkeley set itself a goal to investigate the benefits to organizations
through financial and organization factors that result from the implementation of the
project management processes (Ibbs & Kwak, 1997b). On of their research steps was
the develop of a five-level "Project Management Process Maturity: (PM)2 model
(shown in figure 4) that would allow the project management process information for
a number of organizations to be collected and compared (Ibbs & Kwak, 1998) and to
be used in furthermore researches. These five levels of maturity process are described
as follows (Kwak, 1997):

Level 1 – Ad-hoc Stage Organizations at level 1 do not use formal procedures
for executing a project. Project activities are poorly defined and cost estimates

are inferior.

Level 2 – Planned Stage At the planned stage, informal and incomplete procedures manage a project. The organization has a strength in doing similar and repeatable work.

Level 3 – Managed Stage Most of the project management problems are identified and informally documented. PM data for project planning and management are collected across the organization.

Level 4 – Integrated Stage At the integrated stage, an organization can manage, integrate, and control multiple projects efficiently. PM process data are standardized, collected, and stored.

Level 5 – Sustained Stage At the sustained stage, PM processes are continuously improved. PM data are collected and rigorously analyzed to improve processes. Innovative ideas are vigorously pursued.

The final aim of Ibbs's team is the determination of "success drivers", i.e. to determine the most critical factors for the success of a project and being able to calculate the magnitude of the return on investment that an organization draws from the raise of its project management process maturity (Ibbs & Kwak, 2000).
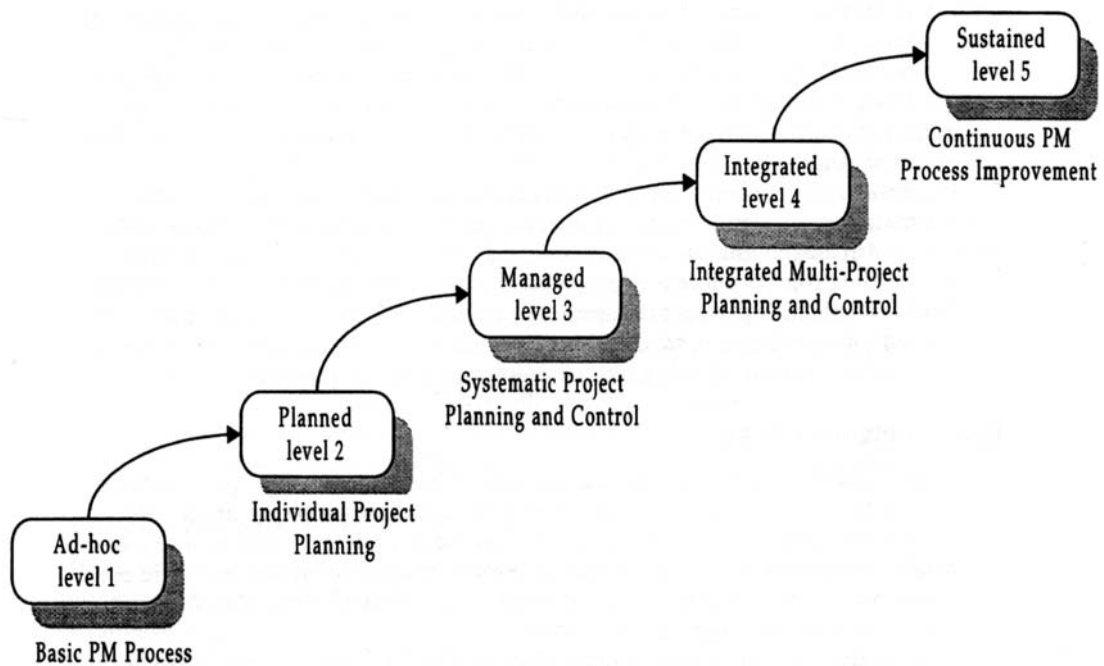
Figure 4 Five levels of (PM)[2] (Ibbs & Kwak, 1997a)

3.2.5 MicroFrame's Self Assessment Tool.

The Microframe Technologies and the Project Management technologies have developed a self-assessment tool for maturity in project management and let it available on the Internet. This tool has 50 multiple choice questions (Enterprise Planning Associates, 2000). The result of this quick self-evaluation tool is a ranking in one of the five following levels :

Level 1 – Ad-hoc The project management process is described as disorganized, and occasionally even chaotic. Systems and data processes are not defined. Project success depends on individual effort. Chronic cost and schedule problems.

Level 2 – Abbreviated Some project management processes and systems are established to track cost, schedule, and performance. Underlying disciplines, however, are not well understood or consistently followed. Project success is largely unpredictable and cost and schedule problems are the norm.

Level 3 – Organized Project management processes and systems are documented, standardized, and integrated into an end-to-end process for the company. Project success is more predictable. Cost and schedule performance is improved.

Level 4 – Managed Detailed measures of the effectiveness of project management are collected and used by management. The process is understood and controlled. Project success is more uniform. Cost and schedule performance conforms to plan.

Level 5 – Adaptive Continuous improvement of the project management process is enabled by feedback from the process and from piloting innovative ideas and technologies. Project success is the norm. Cost and schedule performance is continuously improving.

The Microframe's questionnaire evaluates the maturity of an organization at a very high level and prohibits a detailed analysis according to the areas of process or knowledge. However, it gives the organization an idea where they stand in terms of project management maturity process without having to pass through an expensive and complex evaluation process. From this point of view, this self-assessment tool

comes very close to the PM maturity assessment that the author intend to develop for this study.

3.2.6 Benefits of Maturity Models.

Summarizing and having seen analytically the most important models, the author summarizes his benefits:

- Allow to look into the organization's strength and weakness

- Identify the links between needs and real education requirements.

- Set realistic targets for improvement

- Provide a roadmap for strategic improvement

- Measure progress towards enhanced capability

- Assess organization's project management against agreed criteria

Table 1 The Project management maturity models

	PMMM (Kerzner)	SEI's Capability Maturity Model (CMMI)	ISO/IEC Software Process Assessment	$(PM)^2$ Maturity Assessment Methodology	MicroFrame's Self Assessment Tool
Level 0			Not-Performed Level		
Level 1	Common Language	Initial Level	Performed Informally Level	Ad-hoc Stage	Ad-hoc
Level 2	Common Processes	Repeatable Level	Planned-and-Tracked Level	Planned Stage	Abbreviated

Level 3	Singular Methodology	Defined Level	Well-Defined Level Base	Managed Stage	Organized
Level 4	Benchmarking	Managed Level	Quantitatively-Controlled Level	Integrated Stage	Managed
Level 5	Continuous Improvement	Optimizing Level	Continuously-Improving Level	Sustained Stage	Adaptive

3.3 Project Management benefits.

3.3.1 Project Success in Project Management.

According to a study conducted by KPMG Canada in 1997 (Whittaker, 1999), the three most common reasons for failure of information technology projects are:

- Poor project planning,

- A weak business case,

- Lack of top management involvement and support.

Table 2 Magnitude and frequency of cost overruns (Standish Group, 1994)

Cost Overruns	% of responses
Under 20%	15.5%
21 – 50%	31.5%
51 - 100%	29.6%
101 – 200%	10.2%
201 – 400%	8.8%
Over 400%	4.4%

Table 3 Magnitude and frequency of schedule overruns (Standish Group, 1994)

Time Overruns %	% of responses
Under 20%	13.9%
21 – 50%	18.3%
51 - 100%	20.0%
101 – 200%	35.5%
201 – 400%	11.2%
Over 400%	1.1%

Contrary to what have been expected, the technical complexity isn't between the main reasons for the failure. All the reasons that were mentioned are very clearly project management related. In some business areas, for example in Information technology projects, divergences from cost or schedule plans are the norm and not the exception. Standish Group's CHAOS report in 1994 show that the overrun of the

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average cost of an IT project is 178% (shown in table 2), and the average time overrun 239% (shown in table 3)

Except these if we wanted to combine the maturity of project management with the success of a project, we could see the following elements:

- Companies with more mature project management practices have better project performance. They deliver projects on time and on budget more often
- Project management maturity is strongly correlated with more predictable project schedule and cost performance. More mature companies have a schedule performance index (SPI) variation of 0.08 and a cost performance index (CPI) variation of 0.11. Less mature companies have indexes of 0.16 for SPI and CPI. For a $10 million project, this translates into a $1.6 million cost variation
- High project management maturity results in lower direct costs of project management. Companies with a high maturity level spend 6-7 percent of total project costs on project management. Companies with low maturity spent about 11 percent (Ibbs, William and Justin Reginato, 2002)

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3.3.2 Project Success and Failure.

What are the factors of a successful project and what are of a failed one? Lots of factors involve in the determination if a project has delivered:

• Completeness of planned deliverables

• Delivery according to the planned schedule

• Meeting of financial objectives

• Customer satisfaction

The last point is interesting under the significance that a project can become perceptible in order to be not successful, even if the formally agreed, measurable goals of the project have been achieved objectively. Characteristically, such a situation results when the formally determined objectives of project are not discussed at greater length and agreed with all stakeholders. Nevertheless, this criterion is difficult to be measured in a small scale evaluation as I intend to make for this study. If we check the delivery of a project contrary to what that has been agreed formally, we will see that it would also exceed the available resources for this study. So, we will focus on the second and third points, the cost and schedule compliance, which can be calculated with a small effort.

3.4 Summary of Literature Review.

In Literature Review that hardly preceded, the author wanted to show the situation that exists this moment in Greece in the e-commerce as well as cross-correlation that exists between e-commerce projects and project management..

Big meaning was given by the author in the description of Maturity levels, so that it is rightly comprehended and with this manner the situation in which exists the Greek e-commerce Projects to become more perceptible.

Chapter 4 – Methodologies and Procedures Used in the study

4.1 Methodology of research.

The e-commerce projects have various methodologies of project management available. Project management methodologies exist as well as for other types of projects. In the step of the preparation of the survey's questionnaire, some maturity models have been included and the "Project Management Body of Knowledge" (PMBOK® (PMI, 1996)), in order for the maturity level of software project management of the organizations to be ascertained.

Several models exist for the project management maturity, as we saw it also on chapter 2. In this thesis, the author through the questionnaires that has formed (see appendix A), uses the following five levels that are a complex of the previous project management maturity models.

- **Maturity Level 1 - Initial Process**

  o Processes: No established practices and standards.

  o Management: understands the determination of a project, and knows the need for project management.

- **Maturity Level 2 - Structured Process and Standards**

  o Processes: Processes exist, but are not perceived as an organizational standard.

  o Management: Management supports the application of project management, but the comprehension and the attendance is not

consistent / in effect to all projects. Large projects are executed in a systematic fashion, and management is included in such projects.

- **Maturity Level 3 - Organizational Standards and Institutionalized Process**
    - Processes: All project management processes are in place and established as organizational standards.
    - Management: Management is regularly included in the input and the approval of basic decisions.

- **Maturity Level 4 - Managed Process**
    - Processes: processes of project management, standards and supporting systems are incorporated with other corporate processes and systems.
    - Management**:** Management understands its role in the project management process. There are different management styles and project management requirements for different projects.

- **Maturity Level 5 - Optimizing Process**
    - Processes**:** Processes are in force and actively used in order to improve project management activities.
    - Management: Management is focused not only on effectively managing the projects but also on constant improvement.

4.2 The Survey.

The PMBOK®, is developed by the "Project Management Institute" (PMI). It is used internationally and the current version was released in 2000. The methodology of the PMBOK® consists of nine knowledge areas that are grouped into core functions and into facilitating functions as shown in Figure 5. A number of processes consists the knowledge are. The total numbers of these processes are equal to thirty nine.

Process groups exist that are used to map each process. These five groups are the initiating, the planning, executing, the controlling and closing
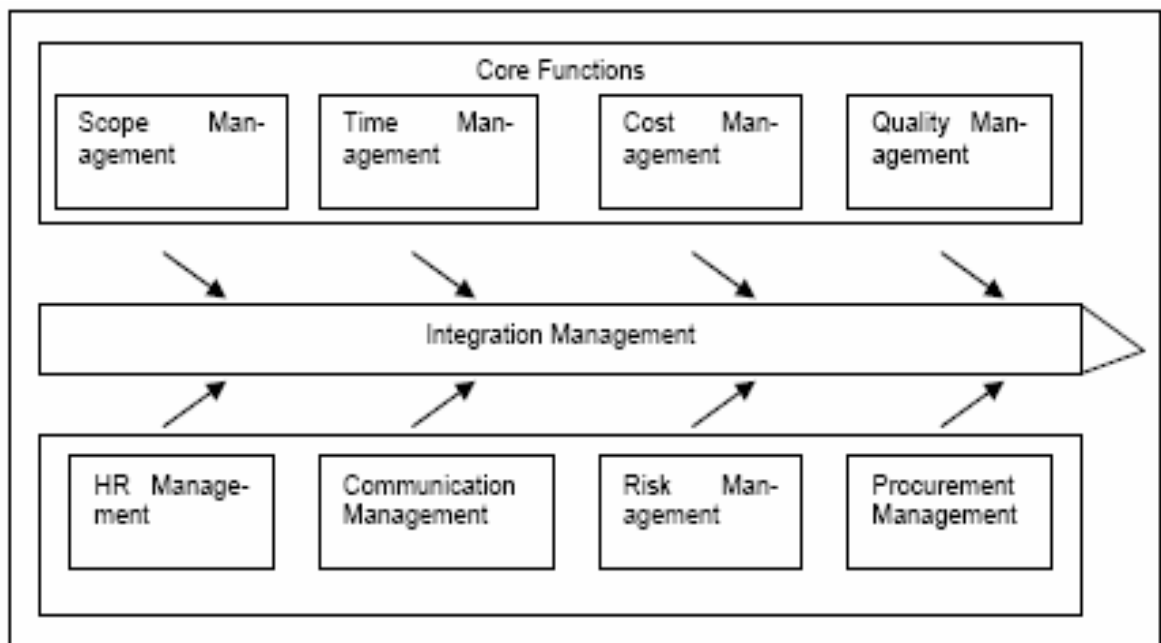

Figure 5 PMBOK® Guide

4.2.1 Selection of Survey Participants.

The questionnaire was sent to approximately 70 e-commerce projects in Greece. The companies are those registered in Greece and they are listed on the Skroutz.gr – E-shops price checker - web site (Website:http://www.skroutz.gr).

4.2.2 Questionnaire Design.

It was a goal of the study to get project data from as many respondents as possible. Distributing paper forms to several hundred people would have been logistically difficult and would have caused major costs for paper, envelopes, and postage. We therefore initially planned to upload the questionnaire to a Web site and to only distribute electronic links to the participants. The feedback that we got from the initial testers of the paper version of the questionnaire indicated that the respondents would feel more comfortable with an electronic from in Microsoft Word format.

The final version of the questionnaire consists:

A questionnaire form that can be distributed to several project participants with 25 Yes/No questions and basic questions supported in knowledge areas (PMI,1996), where the asked have put a degree from 1-5. (see appendix A)

4.2.3 Data Collection.

Data collection was carried out during 2008 by sending questionnaires via email to 70 companies actively involved in e-commerce. A total of 30 companies responded (i.e. 43%). The 30 respondents include small-sized through medium-sized

30

to large-sized companies. An attempt was made to interview the people concerned but this failed because these persons could not find free time to contribute to this research.

The data collected were imported into a Microsoft Excel spreadsheet for analysis.

5.1 Maturity Level by Knowledge Area.

The maturity level of each process is evaluated and also the average results are summarized in Table 4.

Table 4 Maturity levels by knowledge area

Process Area		Average Maturity Level
Integration Management		2.25
Core Functions	Scope Management	2.51
	Time Management	2.31
	Cost Management	2.42
	Quality Management	2.31
Average of Core Functions		2.39
Facilitating Functions	Human Resource Management	2.34
	Communication Management	2.25
	Risk Management	1.77
	Procurement Management	2.40
Average of Facilitating Management		2.19
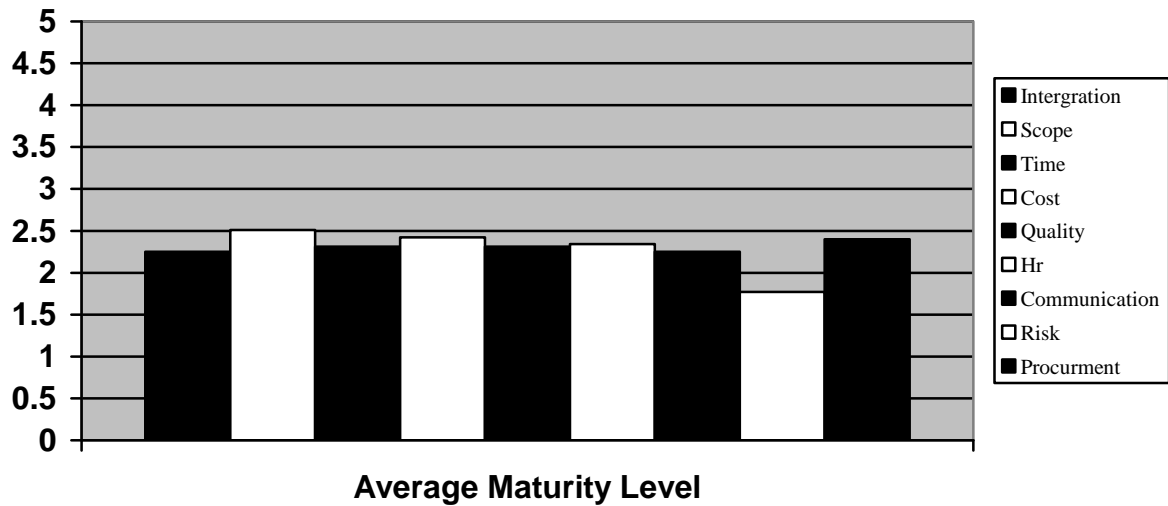
Figure 6 Average Maturity level by Knowledge Area

The majority of the knowledge areas mark an average in the level of the maturity by exceeding the value 2, apart from the Risk Management. This reveals that the Greek e-commerce enterprises must pay more attention to the risk management, which can be an important cause of failure in the software project.

The cost management has succeeded in the maturity evaluation; amongst the other knowledge areas it marks the highest level. This indicates that the Greek E-commerce enterprises are worried enough for the cost overruns. Consequently, high importance is given to metrics that follow the projects' costs.

The Scope Management is faced equally with high priority since this is a knowledge area that should be examined in an early age. An inaccurately formulated scope of the project will of course have important effects in the next phases of the project.

Consequently, it is imperative that the suitable scope is decided carefully so that to extinct the possibility of the risk management to get off track during the next stages.

5.2 Maturity Level by Process Groups.

Each knowledge area of PMBOK®,, considered in the previous section, is subdivided into a number of processes and these processes are mapped onto the following five process groups:

• initiating

• planning

• executing

• controlling

• closing

A further analysis of the data collected by virtue of the above process groups was carried out.

The results are given in Table 5:

Table 5 Maturity Level by Knowledge Area

Knowledge Area and Processes	Initiating	Planning	Executing	Controlling	Closing
Integration Management					
Plan Development		2.25			
Scope Management					
Initiation	2.25				
Scope Verification				2.77	

Time Management					
Activity Definition		2.31			
Cost Management					
Cost Estimating		2.32			
Cost Control				2.52	
Quality Management			2.31		
Quality Assurance					
Human Resource Management					
Team Development			2.34		
Communications Management					
Communications Planning	2.25				
Risk Management					
Risk Identification		1,83			
Risk Management Planning		1.71			
Risk Monitoring and Control		1.77			
Procurement Management					
Contract Closeout					2.40

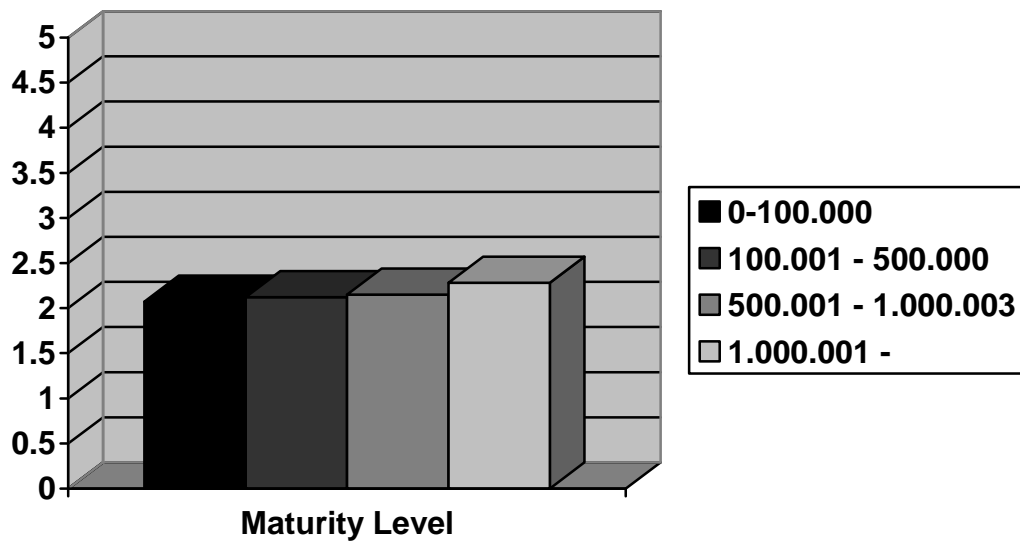**5.3 Maturity Level vs Project Success.**

The particular survey gives us also elements regarding the connection between

the Maturity level of project management and the success of a project, something

which also constitutes the hypothesis of the author.

The two tables that follow present us this connection.

The maturity level results regarding the budget of e-commerce projects.(see table 6;

figure 7)

Table 6 Maturity level and budget.

Budget of Company	Maturity Level
0 - 100.000	2.07
100.001 – 500.000	2.12
500.001 – 1.000.000	2.15
1.000.001 -	2.28

Figure 7 Maturity level and budget.

The results of the maturity level and of the successful Projects in the last 12 months. (see table 7; figure8)

Table 7 Maturity Level and projects success

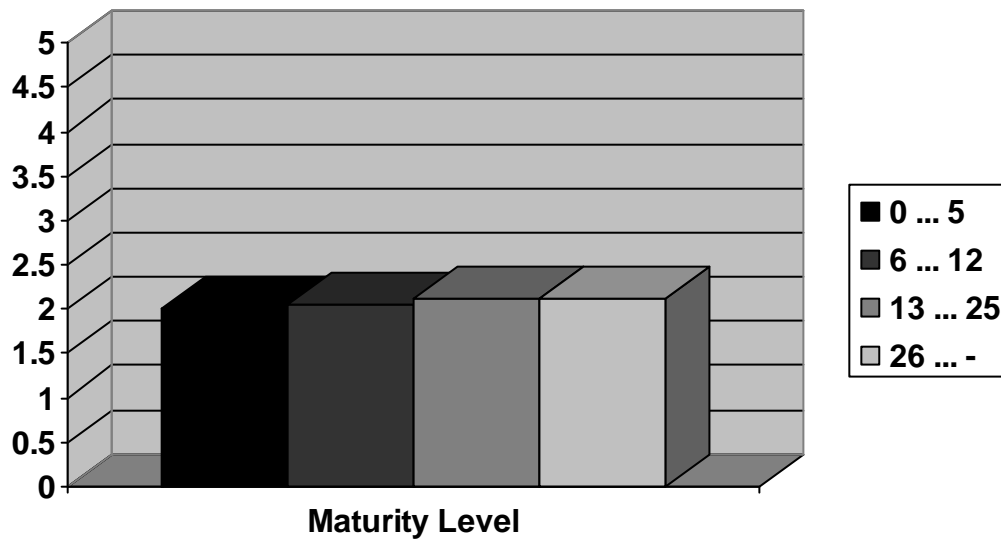| Success Projects	Maturity Level
0 – 5	2.01
6 – 12	2.05
13 – 25	2.11
26 -	2.12

Figure 8 Maturity Level and projects success.

5.3 Maturity Level to other facts.

Beyond the analysis of the project processes, as was reported above, it is of major importance that we analyze some individual components in the maturity of Project management in e-commerce projects in Greece.

Through the research we can also export still one point for Maturity level of project management in e-commerce projects in Greece. In the question *« Are "standardized" Work Breakdown structures in general use?»* the 74% of the respondent answered positively. (see figure 9)
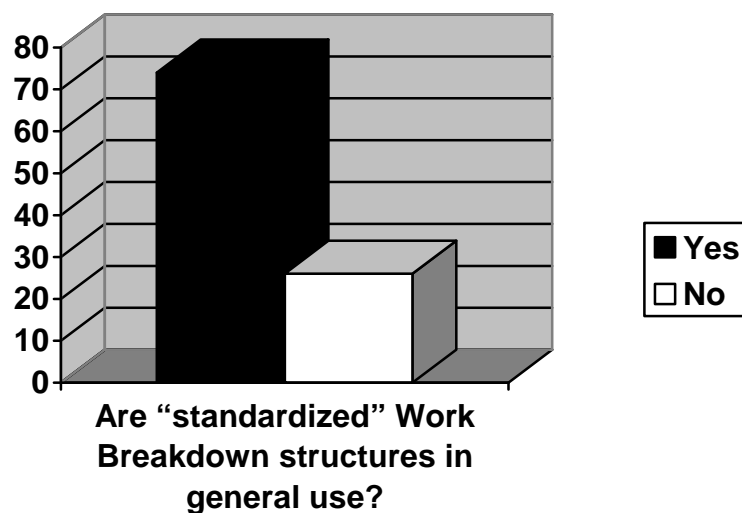

Figure 9 Question 6 Are "standardized" Work Breakdown structures in general use?

A big percentage of the questioned (45%), as long as it concerns in the ways of the personnel motivation they answered that they allow in the team members the

attendance in the decision-makings, so as they have also a share of responsibility in the growth of the project that they have proposed.

Above half of the respondent (63%) in the question «Is a formal change management system implemented and is it effective in use?» answered positively, something that confirms us the perception that the project management is change management.

Besides, a very big percentage (65%) of the asking, answered negatively in the use of software (as Ms Project) in the life cycle project.
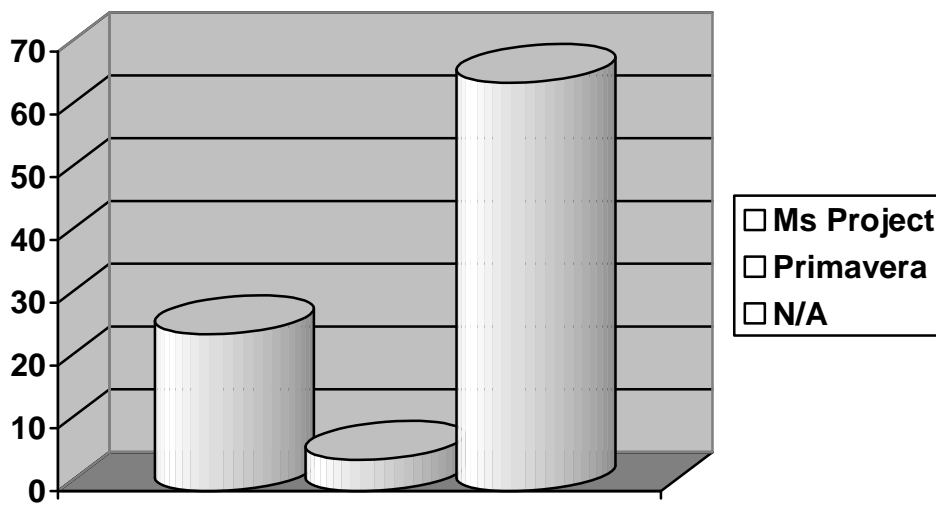
Figure 10 Project management software use.

Finally, the 78% of the asking answered positively in the question if they have somebody certified Project manager.

Chapter 6 — Discussion, Conclusions, Recommendations

6.1 Hypothesis Validation.

The research motivation and problem statement for this study are presented in chapter 1. The hypothesis to be verified was the following:

> The maturity level in project management techniques followed in e-commerce projects is the discriminating factor in the success of the project.

The maturity assessment conducted with 30 e-commerce projects has verified the hypothesis.

6.2 General Conclusion.

The level of maturity of an organisation provides a comparative measurement of records for the success of its operation. Sonnekus and Labuschagne (2004) presented the connection between the level of maturity and the rate of success in software projects that were undertaken in the South Africa with the help of a research that was conducted. A similar survey that was realised in Greece revealed the level of maturity of the E-commerce projects from the knowledge area, the process and the team of process. The obtained results are enough encouraging for Greece as a

developing country. The results show that Greece is making a very concerted effort to progress in the sector of development at the software field. The average level of maturity already exceeds level 2 (average of 2.28) and a tendency exists in order to reach the next level. The second level of maturity is the suitable to describe this moment the maturity level in e-commerce projects in Greece.

Maturity Level 2 - Structured Process and Standards

Processes are repeatable across projects. Basic project management processes are used to keep track of cost, schedule and quality.

Studying the Sonnekus and Labuschagne (2004), it is clearly presented the existence of a connection between the maturity of project management and the success of a project. We lead to the conclusion with the note that the current survey supports the need for a methodology that can bridge the existing gap in the project management of e-commerce between Greece (or potentially other developing countries) and the developed countries in an effort to internationalise the discipline.

"We are what we repeatedly do. Excellence, then, is not an act, but a habit "

Aristotle (384-322 BC)

6.3 Recommendations.

According to Sonnekus and Labuschagne (2004), a link exists between project management maturity and project success. We conclude by noting that the current survey supports the need for a methodology that can bridge the existing gap in

e-commerce project management between Greece and developed countries in an attempt to globalize the discipline.

As se saw in the previous chapter (chapter5), the Greek e-commerce deprives in risk management. Big importance should be given in the risk management at the duration of Project life cycle and more concretely in the planning.

The strategic risks and the upside opportunities should be encompassed by the risk management. The benefits of this integrated risk management approach include:

- Spanning the gap of strategy and tactic in order to ensure that the delivery of project is tied up in the vision and the needs of an organization.
- Turning the projects on the benefits that they exist to support, despite the production of a set of deliverables.
- In an uncertain environment, the decision-makers should be provided with useful information at all levels.
- A suitable level of risk to be allowed to be taken smartly with the complete awareness of the uncertainty degree and its likely results in the objectives.

Finally, we encourage Greek e-commerce projects, to make use of this new tool (project management maturity model) and thereby help the project management discipline get the recognition it deserves based on its value to organizations - companies.

6.4 Future Profits.

Greece continuously develops and places new objectives for the betterment of life of her citizens. E-commerce is a sector that helps in this growth. The phenomenon of electronic market grows and gains continuously more and more new interested people.

The research proved us how the project management as a new sector in the Greek society helps catalytic in the growth and in the biggest success of a project.

The author believes that Project management will infiltrate more in Greek e-commerce and it will still help more businessmen in the success of their projects.

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Appendix A   Survey Questionnaire

The questionnaire sent to 70 e-commerce project in Greece, and it is shown on the following pages.

Questionnaire

Section A

General Information

1. Total no. of staff in your organization _____
2. Name of company _____
3. Position of respondent _____
4. Would you like to receive an electronic copy of the survey results Yes/No (delete whichever is not applicable)
If yes, please provide your email/postal address
_____
5. Budget of company _____

Name : ....
Surname: ....
Telephone: ....
E-mail: ....

Section B

Project Success and Failure

- ▪ **Project success**

A successful project is a project that is delivered on time, within the budget, and on brief (in scope).

- ▪ **Project failure**

A failed project is a project that is never completed or does not meet customer expectations.

- ▪ **Project challenge**

A challenged project is a project that is completed, but is either late, over-budget, or does not meet all the requirements.

Total number of projects completed in last 12 months by your company	
Number of **successful** projects in last 12 months	
Number of **failed** projects in last 12 months.	
Number of **challenged** projects in last 12 months	

Section C

Project Management Maturity

1. Overall Level of Maturity	1	2	3	4	5
a. What do you think the overall level of project management maturity is in your company?					

2. Are the business processes within the organization repeatable?

□ Yes   □ No

3. Is any project methodology followed?

□ Yes   □ No

4. Is "buy-in" to the process consistently obtained from all stakeholders, as well as from project team members and others who will perform the work?

□ Yes   □ No

5. Is project estimating done at a high level and is it broken down by accounting codes instead of by project deliverables (WBS)?

□ Yes   □ No

6. Are "standardized" Work Breakdown structures in general use?

□ Yes   □ No

7. Are costs and schedules integrated through the WBS and pro-actively tracked, controlled and forecast?

□ Yes   □ No

8. Are most project schedule updates simply "pretty pictures", consisting mainly of assessing per cent complete for the project at very high level breakdowns with no baseline contrasted against current status?

□ Yes   □ No

9. Is project status data that is provided to the team timely enough to allow for proactive analysis?

□ Yes   □ No

10. Is project status used mainly only for historical/reporting purposes?

□ Yes   □ No

11. Is Earned Value (EV) used to ascertain the progress of the work via a set of pre-defined metrics?

□ Yes   □ No

12. Is a formal change management system implemented and is it effective in use?

□ Yes   □ No

13. Are project management processes formalized and encompass methods and practices for planning and controlling multiple projects?

□ Yes   □ No

14. Are the project management processes well defined, quantitatively measured, understood and executed?

□ Yes   □ No

15. Is any project data captured? Any Software tools used? What have been the advantages of using this software?

□ Yes   □ No

16. How are project roles determined?

17. How is project information communicated?

18. How do you motivate team members who are burned out, or bored?

19. Give me an example of your leadership involvement where teamwork played an important role.

20. Are there certified project managers in the company?

□ Yes   □ No

Section D

Project Management Maturity II

1. Project Integration Management	N/A	1	2	3	4	5
a. Project Plan Development						

2. Project Scope Management	N/A	1	2	3	4	5
a. Initiation						
b. Scope Verification						

3. Project Time Management	N/A	1	2	3	4	5
a. Activity Definition						

4. Project Cost Management	N/A	1	2	3	4	5
a. Cost Estimating						
b. Cost Control						

5. Project Quality Management	N/A	1	2	3	4	5
a. Quality Assurance						

5. Project Human Resources Management	N/A	1	2	3	4	5
a. Team Development						

6. Project Communications Management	N/A	1	2	3	4	5
a. Communications Planning						

7. Project Risk Management	N/A	1	2	3	4	5
a. Project Risk Management						
b. Risk Identification						
c. Qualitative Risk Analysis						
d. Quantitative Risk Analysis						
e. Risk Response Planning						
f. Risk Monitoring and Control						

6. Procurement Management	N/A	1	2	3	4	5
a. Contract Closeout						

Thank You.
Ilias K. Filias.