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The term “*risk*

human perception on making a decision [6]. The study of risk management began after World War II and in the beginning it aimed at protecting people and companies from losses that came out of accidents. During the 1950s, new types of risk management made their appearance, while in the 1960s there were developed activities focusing on handling unexpected events. The following decades of 1970 and 1980 second-generation types of risk management were implemented and economic management was enhanced. It was after 1990, when functional risk management and liquidity risk management emerged. Furthermore, during the same period addressing risks started spreading throughout the globe [9].

5.0 [illegible]

According to NIST (National Institute of Standards and Technology), risk management is the procedure of identifying risks, evaluating them and following steps to reduce these risks to a tolerable level [10

Risk exposure. It is defined as RE = P x C, where RE is risk exposure, P is the probability of an undesirable outcome and C stands for the consequences of this outcome.

Risk leverage. It is defined as (REbefore – REafter) / [risk resolution cost], where REbefore is the RE before starting the resolution process and REafter is the RE after the process is completed. Consequently, risk leverage is a measure of the relative cost, when several activities for risk resolution are being implemented.

Risk threshold. It is specified relying on a quantitative objective, for every risk parameter. A risk is acceptable as long as its value does not overcome the threshold.

Annualized loss expectancy. It is the expected monetary loss due to a risk over a one year period. It is calculated by summing the loss for every asset of the company, because of a single risk, multiplied by the risk's occurrence rate.

Return on investment. The economizing achieved by managing one or more risks, divided by the management cost [15].

7.0 [illegible]

Just like any other strategy, risk management employs particular approaches for the purpose of accomplishing its goals. There have been developed different models, each one with specific procedures, which focus on different issues.

Table 1: Comparison of six basic risk management models

- How many projects fail when using and when not implementing risk management;
- How effective are formal and ad hoc risk management approaches.

8.3 [illegible]

The study was anonymous, was conducted between March and July 2015 and involved Greek companies or international companies with a Greek branch that engage in developing software. The majority of the companies were mainly involved in web designing. Overall, 85 responses were gathered. The person who responded was asked to be a project manager or somebody with appropriate knowledge for completing the questionnaire. Moreover, we requested that only one response was returned per company.

The majority (75) of the sample consisted of small companies with less than 10 employees. Five companies had 10-49 employees and the remaining five 50-250 employees.

37 of the 85 companies were relative new, being active less than 5 years, while 32 companies were active 5-10 years and 16 were founded more than 10 years ago.

8.4 [illegible]

In total 47 out of the 85 companies claimed to be using a strategy for managing risks.

The prominence of ad hoc approaches over formal techniques was evident, as 31 companies used informal methods and 16 preferred formal techniques.

Figure 1: Percentage of failures/cancellations without the usage of risk management, with the usage of a formal risk management method and the usage of an ad hoc method

The results show that there is a slight difference among companies that did not use any risk management approach, companies that opted for a formal method for managing risks and respondents that preferred an ad hoc, tailor-made approach.
For the purpose of validating this conclusion mathematically, responses for the three groups of users were divided in two categories: the first containing those who reported a failure rate below 25% and the second merging all answers that were equal or above 25%, as Table 2 depicts.

Table 2: Categorization of responses for a failure rate below and above or equal 25%

<25%	34	15	24
>=25%	4	1	7

Most of risk management users certify its effectiveness concerning the successful completion of software projects (Figure 2). In detail, 40 respondents perceived that it increases the possibility of a successful outcome, 1 stated that is has no effect and 6 were not sure regarding the impact of risk management.

Figure 2: Risk management impact on software projects success for users of the risk management approach

8.5 R

It is presumable that the responses were not completely accurate, despite the fact that we guaranteed that all the information submitted would remain strictly confidential and it was not possible for us to identify any of the companies, which participated in the research. This is a general challenge when using questionnaires regarding confidential data.

Specifically, we are very sceptical concerning the questions related to the percentage of the unsuccessful projects, as the companies may have conce4(f)10(8(ce4()6(s)-7(f5(s)2(u)5(99(ect)3
ens svhe datathat wu(d)-7(hn)-7(y-17 p)-7(o)-19 theiclly h59(u)5(r)-5t(t)-12(h59(e)-3i(r)-5(r)-5(e)37 p)-7(u)5t(a)-3

The percentages of failed software projects among companies which did not follow a risk management strategy, companies that used a specific model and companies that managed risks with a custom-made approach were hardly diverse.

Thus, from this survey it can be concluded that using risk management did not provide a notable advance in terms of successful software completion and no significant difference was observed in failure rates between users of a formal and ad hoc risk management technique.

10.0 R

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