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A Simplified Enterprise Risk Management (SERM) Model

Asma'a Ahmed ALQarni[1], Mashael Mahmoud Khayyat[2]
[1, 2]Department of Information Systems and Technology, College of Computer Science and Engineering, University of Jeddah, Jeddah, Saudi Arabia
Email address: [1]aaalqarni @ uj.edu.sa, [2]mkhayyat @ uj.edu.sa

Abstract— *This paper is a magnifying lens for applying risk management (RM) at an enterprise level. The challenges and realities of applying RM are difficult. However, neglecting or ignoring risk management at any enterprise would be a basic reason for failure or even termination of this enterprise. In this paper, primary and secondary data collection methods have been employed: A Literature review of previous research that corresponding to RM; and a questionnaire survey technique which is about risk management. It has been built upon the Fourth Generation Activity Theory. The analysis resulted from the literature review and the survey's responses (100 participants) led to the creation of the Simplified Enterprise Risk Management (SERM) Model. In this research, it has been found that simplifying the process of RM and providing a clear model can help in using it. It has been found that in this research that even though there are many research papers that provide rich information about how to manage risk in organizations and institutions, there was a need for visualizing and simplifying the process of adopting risk management that need to be part of the enterprise's culture.*

Keywords—*Enterprise Risk Management; Risk Management Professional; Risk Management processes; Risk Management Model.*

I. INTRODUCTION

Starting with Murphy's law, "Anything that can go wrong will go wrong" [1] gives an impression about the necessity of being cautious to avoid or prevent things from going wrong. This concept is related to a critical area, which is how to manage risk. Risk can be defined as "an uncertain event or condition that, if it occurs, has a positive or negative effect on one or more of a project's objectives" [2].

"Risk management is one of the most important techniques that has to apply in every enterprise. The growth of enterprise challenges and development could lead to critical risks, which end to certain failure. Enterprise risk management (ERM) is "the set of activities used to affect the management of risk across the whole enterprise; Risk management is recognized as an integral component of good management and governance and is considered as a project in itself" [3]. One of the most famous references in this area is the PMI seven Project Risk Management processes are: Plan Risk Management, Identify Risks, Perform Qualitative Risk Analysis, Perform Quantitative Risk Analysis, Plan Risk Responses, Implement Risk Responses, and Monitor Risks [4]. Enterprises must have an increased state awareness of holistic risk management because of many factors: globalization, digitalization, accounting and reporting deficiencies, complex financial instruments, complex manufacturing processes, industry 4.0, and artificial intelligence [5].

The risk approach widely includes risk measurements and risk management [6]. Many reasons put the enterprise in a risk position like budget, quality, time. By considering the various potential risks or events before they occur and manage them, an organization can survive, save money, and protect their future.

Risk classified into four categories: operational risk, market risk, credit risk, and strategic risk; Operational Risk, as "commonly defined and understood, is basically the risk of loss on account of inadequate or failed people, process, system and/or event" [7]. Market risk is "the risk faced by an organization because of market movements and fluctuations" [7]. Credit Risk refers "to the risk of a counter-party not honoring their obligations and defaulting in making timely payments to the organization" [7]. Strategic Risk refers to "material risks that can impact the laid down strategic plans of an organization" [7]. To more view that is comprehensive and understands the risk management as well, authors offer important definitions of concepts in the field of risk management as follows:

•The risk appetite of an organization" represents its overall philosophy to risk-taking and the expectations of its stakeholders such as shareholders, policyholders, and bondholders [6].

•Risk Tolerance "refers to maximum downside an organization can withstand, on account of a risk materializing"[7].

•Risk limits "present a more precise level of risk tolerance that is allowed to put in risk management" [6].

•Risk Universe is "the complete universe of risks an organization is exposed to, broadly covering therein the risks associated with the industry the organization is operating in, the internal organizational risks and controls and the external ecosystem risks"[7].

This paper aims to provide a model, or a road map for the simplified implementation of risk management at the enterprise level. To reach this goal, we have to answer all of the following questions:

- What is the main idea of efficient Risk Management?
- How can we apply it to enterprises?
- What are the main success criteria for risk management?

This paper will answer all these questions by discussing an important topic that is RMP "(Risk Management Professional)." Definitely, RMP can be considered as a

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protocol (lessons) that organize processes to apply efficient risk management in any enterprise.

II. Literature Review

The risk management concept has been explained in many research fields, for example, [8] explaining risk management in the range of software development environments. They approve that; project managers can increase the likelihood of project success by implementing RM effectively. The authors in [3] define enterprise risk management (ERM) as "the set of activities used to affect the management of risk across the whole institution, as opposed to discrete risks inside business silos". Their research was like an overview of enterprise risk management. Others like, [9] concern about risk management techniques, methods and approaches according to information systems development. They agree that; the failure rate of information systems always high even it comes with advanced technologies such as expert systems; it also explains the reasons. Other authors focus on the risk management in the area of banks such as [10]; they apply the rule of thumb of the triangle of demand on building a project of high quality as possible, as low cost as possible and short time as possible. The rule of thumb forces us to choose two of the three demands (quality, cost and time) that bank faced. There are researches of RM like [6] build in the base of the Solvency II framework. They divided the risk function into two parts: risk management and risk measurement. They concentrate on the risk management part and they add related model. In the focus of the critical success factors of RMS, [10] interviewed 12 risk management experts and elicited their points of view and ideas that they already have their hands on. One major criterion, the lack of knowledge in critical success factors of enterprises, would cause difficulty to identify risks. De Bakker, Boonstra & Wortmann (2010) discussing how planning for risk management contributes to IT project success and the relations between risk management and project success by using key element stakeholders[11]. DOVAL (2019) explains a number of general aspects regarding project risk, types of risks and deeply risk management processes and stages[12]. He satisfies that risks should not be ignored or hidden; the project manager and his entire should treat them as a responsibly Team. Research [13] aims to provide an insight into the relationship between Enterprise Risk Management and Business Performance Management. [7] verify that the core fundamental of ERM is to add value to all stakeholder functions in the company through identifying existing and potential risks and ensuring that the identified risks are controlled - thereby resulting in successful attainment of defined business objectives and strategic plans. In other words, Integrating ERM into the organizational strategy, performance and day-to-day workflow is of utmost importance for the long-term viability and sustainability of an organization. Here, Taarup-Esbensen (2019) [14] is conceptualizing risk as sense-making becomes relevant due to the complexity of information available to the risk manager with time constraints, this means that risk managers increasingly rely on making sense of possible threats rather than on the accuracy of the information received.

Enterprises in everywhere should focus their limited resources which actually considered a key for success or failure [15] and it is important to identify and assess project risks, mitigate threats and develop risk responses [6]. Here, it is vital to make sure that the basic knowledge about simple but important tools are gained. For example there are famous tools that can be utilized in the area of risk management which are the concept of house of safety [16] and the risk assessment matrix [17] as shown in Fig. 1.

					Insignificant	Minor	Moderate	Major	Catastrophic
	Probability	Historical			1	2	3	4	5
Likelihood	>1in 10	Is expected to occur in most circumstances	5	Almost certain	M	H	H	E	E
	1 in 10 – 100	Will probably occur	4	Likely	M	M	H	H	E
	1 in 100 – 1000	Might occur at some time in the future	3	Possible	L	M	M	H	E
	1 in 1000 – 10000	Colg occur but doybtful	2	Unlikely	L	M	M	H	H
	1 in 10000 - 100000	May occur but only in exceptional circumstances	1	Rare	L	L	M	H	H

Fig. 1. The risk assessment matrix

Keeping in mind that the risk exposure is calculated according to the following formula [2]:

$$re=rp*ri$$

where re means that risk exposure and rp refers to risk probability (likelihood) and ri refers to risk impact (effect on the project objectives if a risk event happens.

Even though, risk assessment can be determined quantitatively and/or qualitatively, the risk can be managed better if it has been calculated quantitively.

Regarding the categorization of risk, it needs to be clear that risk can include Negative risks which are known as threats and positive risks which are known as opportunities[2]. Furthermore, if the risk only have a negative consequence, it is called pure risk, otherwise, if it can have a positive or negative consequence, then it is called business risk [2].

Now, we will present our methodology for conducting this paper.

III. Methodology

In this paper, primary and secondary data collection methods have been employed: A Literature review of previous research that corresponding to RM; And a questionnaire survey technique which is about risk management. It has been built upon the Fourth Generation Activity Theory. Questions of the survey are including the aspects shown in Fig. 2.

The questionnaire survey was sent to the enterprises that have RM departments. The survey's Questions, the fourth generation of activity-theory [18] and based reflected the opinion of a100 participants.

For simplicity, the questions were multiple-choices and were qualitative in nature. The survey has been sent by e-mail first, but only five enterprises responded. Hence, the authors tried another plan by contacting enterprises over the telephone to explain the purpose of the survey and how it is simple and not time-consuming to convince them to participate.

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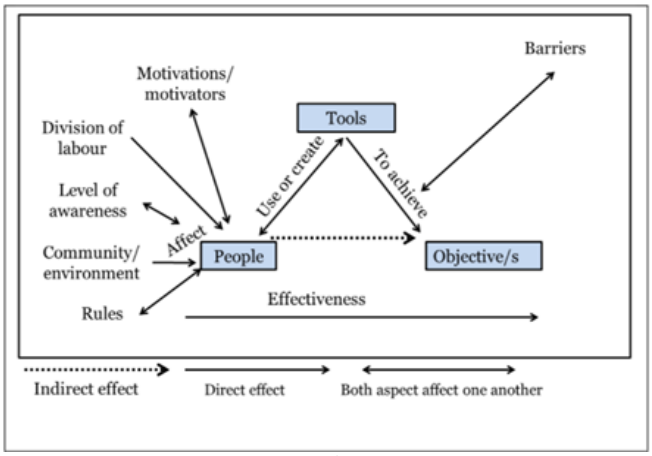

Fig. 2. The Fourth generation of Activity Theory Model [18].

Questions of the survey are shown in Table.1:

TABLE I. Survey Questions of RMP.

Q1	Have you heard about risk management?
Q2	Do you think risk assessment is useful for your company?
Q3	Does your company use a recognized training method to facilitate the improvement of general knowledge of risk?
Q4	Are you looking for a training course in the field of risk management?
Q5	Does your company think that risk management is an integrated part of your business?
Q6	Do employees have a common perception of what risk means for the company?
Q7	Does the company management encourage the reporting of events in order to identify the risks?
Q8	Does the company effectively communicate the risk to the employees or stakeholders (internal and external)?
Q9	Is it understood that the risk management effectiveness critically depends on data collection, analysis and dissemination of relevant data?
Q10	Organizational support. Do you have a clearly defined the organizational structure at organization level in order to sustain the risk management process?
Q11	Risk assessment. Do you have any system and/or operational procedures that manage the processes of risk identification, measurement, ranking, treatment, monitoring and recording the risks, which affect your organization's objectives?
Q12	Risk utilization in the decision-making process. Do you evaluate and record the risk when you make important decisions (launch of projects or new products, development of strategic plans, works, etc.)?
Q13	Professional training. Is there any training method used to facilitate the knowledge improvement on risk?
Q14	Inspections. Do you have implemented any inspection plan to reduce the inherent risks, which are periodically revised?
Q15	Warning systems. Do you have monitoring systems in the potential high-risk areas that identify the changing of risk level?
Q16	Preparing for unlikely events. Do you have plans for emergencies related to unlikely events but with major consequences, which can stop the company's activity?
Q17	Risk transfer. Does your company use instruments for risk transfer or sharing with other organizations?
Q18	Risk review. Do you have a risk review process, after implementation of the mitigation measures/controls for identified risk?

IV. Data Collection

After many trials of communications with enterprises, the authors get 100 responses. More than 90% of responses emphasize the importance of the following risk management concepts; those concepts listed below approved by many questions in different ways to get the qualitative data: Risk assessment.

- ✓ Training method of risk management.
- ✓ Risk management integration over enterprises.
- ✓ Employee perception of what risk means.
- ✓ Reporting events of risks.
- ✓ Effectively communications with stakeholders about Risk.
- ✓ Data collection about risk.
- ✓ Organizational support.
- ✓ Risk utilization in the decision-making process.
- ✓ Risk planning.
- ✓ Risk treatments.
- ✓ Risk transfer.
- ✓ Risk review.

Most of the answers, of all questions were yes very much and yes certainly.

V. Results and Dsicussion

After critical thinking of both of the previous literature review and the qualitative survey, in the world of uncertainty, complexity, and ambiguity, the enterprises can be protected and maintained its leadership position built through perseverance, innovation, and commitment - only through ERMP as emphasized by Jivaasha (2020) [7]. This paper summarizes risk management professionals over enterprise in the easy understanding model to encourage facilitating the understanding of risk management processes in clear stages. In the model, we can see a simplified and summarized model (see Fig.3) that is consisting of five stages to accomplish risk management. These stages are: risk identification, risk assessment, risk planning, risk implementation (response), then, finally, risk monitor, and review; these processes are continuous inside loop except risk identification done only once in the beginning unless contingencies happened as it is assumed in this paper. In reality, there are boundaries that can affect RM in all the stages, such as stakeholders and enterprise culture and more details will be discussed later.

Even though the seven common Project Risk Management processes are Plan Risk Management, Identify Risks, Perform Qualitative Risk Analysis, Perform Quantitative Risk Analysis, Plan Risk Responses, Implement Risk Responses, and Monitor Risks. Thus, this research simplifies and summarizes them to five-stage and emphasized the loop in the model as shown in the arrows in Fig.3. Now the details of each stage are explained as follows:

Stage 1: Risk Identification:

This paper assumes that risk identification is made only at the first phase to identify existing and prospective risks for the enterprise by risk identification workshops, studying economy and industrial reports, utilizing past risks, audits, and incident reports [7]. To identify the risk successfully, you have clearly understood the enterprise's success factors like costs, duration, and performance; the risk is a thread inside more than one success criteria [9]. During risk identification, checklists focus on the general risk that leads to specific risks [11]. Brainstorming is an effective generation of information to collect risks and answer any questions related to RM [11].

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Example of Enterprise risks; IT failure a business system, extreme weather or natural disaster, theft of intellectual property, cyberattack, infrastructure failure (power, water, transportation, etc.), customer privacy issues, supply chain issues, customer backlash/adverse and workplace misconduct [13].

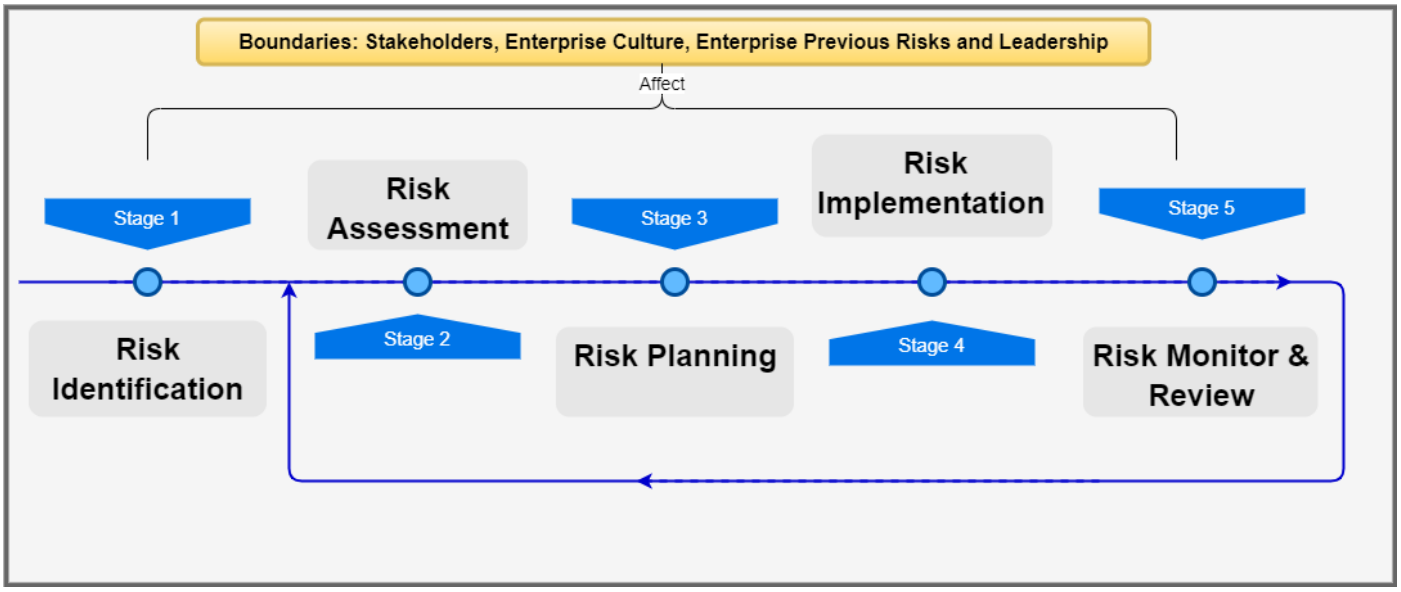

Fig. 3. The Simplified Enterprise Risk Management (SERM) Model

Stage 2: Risk Assessment:

Risk assessment goes through two necessary steps in order: risk analysis and risk evaluation. First, risks analysis defined by the two following questions:

Q1: How often can the concerned risk event/incident hit the entity? , Indication to frequency [7].

Q2: If the risk event materializes, how would it influence the company as a whole? , Indication to Severity [7].

After risk analysis, risks are categorized into different levels based on risk evaluation, ranking risks into high, medium, and low risks. In other words, the risk evaluation step is like a prioritization of risks[7].

Stage 3: Risk Planning:

Risk planning is the way to take actions toward risk, although sometimes there is no quick solution to avoid or mitigate risks; it tells you how to handle risk inside your enterprise. A plan should be developed regularly to reduce these risks [12].

In this process, risk can be consider as Upside Risk or Downside Risk; this concept is determined carefully to choose the best plan [19]. Upside Risk is more complicated and rarely used; it focuses on positive risk or opportunity that identifies the enterprise's benefits, while Downside Risk focuses on the negative risks impact the enterprise [19].

Stage 4: Risk Implementation (Response):

Response to risks is a suitable treatment implementation according to risk plans. Risk responses mostly achieved one of these objectives:

- ✓ Avoid the risk at all, which is the best plan [12].
- ✓ Mitigate the impact of the risk if it cannot be avoided [12].
- ✓ Transfer the risk internally or externally, for example, to insurance companies [7].
- ✓ Accept the risk since there is no solution at all [7].

Stage 5: Monitor and Review:

Risk monitoring is internal reports or documentation that describe every risk faces the enterprise and how to manage it across different processes in detail and reports over enterprise should have a common language that is understood for every employee and even new employees; such as quality reports, progress reports and tracking reports [12]. These types of the report make employees know the types of risks that may hit the enterprise and manage them professionally. Risk reviews contain regular meetings to keep updated and detect changes from external and internal risk management contexts [12].

Boundaries:

Several boundaries affect all stages of risk management professional positively or negatively upon its use. Their boundaries integrated overall processes considered the heart of RMP.

- Stakeholders or team risk management are defined as risks associated with different members inside an enterprise, sharing risk responsibility and how members dealing best with related risk according to their field of work [8]. Members need training courses of RMP, sharing knowledge and experience and soft skills to participate in risk management successfully; If members of enterprise trained well, they can adapt RM practices to their particular work environment [8]. RMP's key element is the stakeholder perception of risk and stakeholder behavior in the risk management process [11].

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- Enterprise Culture or risk culture is the norms, traditions, behaviors of groups or individuals inside the enterprises that determine how they identify, understand, discuss and act to face the enterprise's risks [6]. Examples of risk culture over enterprises depending on the size of the enterprise and performance, risk appetite, stress testing, risk measurement, reporting [6].
- Enterprise Previous Risks or known risk factors is a documentation process of lists and quantifies risks and causes them for the current project in detail; these documents will be used in the order in the next project as input to prevent previous risks, and new risks factor will occur [11] as shown in Fig. 4. New risk factors also added as known risk factors as input for the next project inside the enterprise and so on [11].

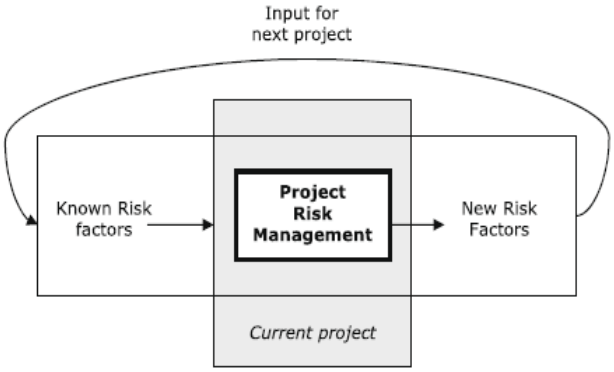

Fig. 4. Enterprise Previous Risks [11].

- Leadership is the administration level of risk management, always responsible for decision-making toward RM and have to be a knowledge experience in every field in the enterprise and its corresponding RM [10]. Leadership should have soft skills to coordinate and schedule RM within every entity, and dividing RM responsibilities over employees upon their field of work and coordinate relationships between them for better RM and smoothness of work [10].

After all, we can see that stakeholders, enterprise's culture, and previous risks and leadership are examples of risk management boundaries, which can positively or negatively affect the overall process.

VI. Conclusion

In this research, it has been found that there is a need to create a Simplified Enterprise Risk Management (SERM) Model to be used as part of the enterprise culture to face all kinds of risks and reach its goals, vision, and mission. Adopting the SERM model can save the enterprise from failure. Ultimately, in each context, there are boundaries, which will affect the results of risk management.

The authors faced many challenges in dealing with different enterprises to see their perspectives regarding RM. For future research, some ideas are recommended to be investigated, such as utility risk management and converting those risks into benefits through creative planning.

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