Managing operational risks has become an importance aspect for every organisation. In the past, many operation management studies have focused on the improvement of operational performance. A large number of research publications included topics such as reduction of process variability, increasing flexibility or implementing controls in operations. It seems that research interest is now turning to operational risk management as well.

A literature review carried out in this field revealed that organisations make use of various frameworks and models to deal with risks in their operations. Although these frameworks differ in some aspects, there is strong evidence, however, that organisations seem to favour an Operational Risk Management (ORM) framework that is based on commonly used management systems including the Quality Management System (QMS), Environmental Management System (EMS), and Occupational Health and Safety Management System (OHSMS).

Drawing on these critical findings, this paper introduces a conceptual framework for managing operational risk based on commonly used management systems. It concludes with a discussion and direction for future research.

KEY WORDS
Operational Risk, Operation Management, Risk Management, and Management Systems

1. Introduction

Today’s business environment is more complex than ever. All businesses have to live with uncertainties in every aspect of their operations. Therefore, managing risks in operations has become an essential element for every organisation to sustain their competitive advantage in the market place.

Operational risk (OR) typically covers a board range of risks that are internal to the organisation ([1]). It can be defined as the risks associated with losses that may result from inefficiencies or non-conformances within operational processes of an organisation including quality, environmental, and occupational health and safety risks, just to name a few ([2]).

There has been an increasing trend of interest in operational risk management in financial sector after Barings Bank collapse in 1995. Traditionally, financial institutions have focused more on market risk, credit risk and other financial risks rather than operational risk ([3]). In non-financial sector, on the other hand, many researchers dedicated their efforts to various areas of operation management research. However, research on operational risk management (ORM) seems to be limited. Most of the researches in operational risk management have focused more on reducing risks of producing nonconforming products or inadequate services (quality risks) ([2]). There is convincing evidence that using systemic approach to manage operational risk is much more effective than an ad-hoc approach. However, many organisations seem to use an ad-hoc approach to deal with operational risks ([4]).

The purpose of this paper is to introduce a conceptual framework for managing operational risk based on the commonly used management systems.

The paper is structured as follows: Section 2 illustrates the history of risk management while Section 3 describes the management systems commonly used by organisations to manage operational risks. The proposed conceptual framework for effective use of operational risk management systems will be then discussed in the following section. The last section of the paper presents the conclusions.

2. History of Risk Management

According to Sadgrove ([5]), the history of risk management can be broken into three eras as shown in Figure 1. The first era of risk management was around the
1960s and 1970s. Organisations focused only on managing non-entrepreneurial risks. They commonly used an ad-hoc or passive approach to manage their risks. However, several changes including stricter government policies, increased customer demands, and growing public concern have made an ad-hoc or passive approach inadequate for dealing with risks. These contextual changes have forced organisations around the globe to re-think their risk management strategies ([6]).

During the second era in the 1970s and 1980s, the organisations adopted various quality concepts to reduce the variation in the process as a proactive approach for managing losses. In the current and third era of risk management that begun around the mid of 1990s, organisations have been focusing on both internal and external risks and employing management system standards and frameworks as guidelines to systematically control risks.

3. Operational Risk Management Systems

Operational risk is different from other types of risks because it deals with established processes rather than managing the unknown circumstances ([7]). It does not mean that handling operational risks is an easy undertaking as they are interrelated in many complex ways. One operational risk can have impact on other operational risks in the system ([8]). Therefore, managing risks in operations require a systemic and repeatable approach.

Currently, organisations use various approaches and models for dealing with risks in operations. One of these approaches is based on the risk management system standard. Australia and New Zealand have been pioneers in the development of risk management system standards (AS/NZS 4360 series). Many organisations currently use the guidelines proposed by these standards as a basis for their risk management system ([9]). However, it is too early to say whether these standards are effective in handling operational risks. The number of research studies on the effectiveness of these standards is limited.

The Enterprise Risk Management (ERM) framework is an alternative option preferred by some organisations ([10], [11], [12], [13], [14], [15], [16], [17], [18]). Like the AS/NZS 4360 framework, due to limited research it is too early to suggest that implementing an ERM model leads to better results in regard to managing operational risks.

As another alternative, many organisations favour the use of management system standards including ISO 9001, ISO 14001, and AS/NZS 4801 to deal with operational risks. Quality management system is one the most frequently studied frameworks in the operations management research field ([8]). Consistent with this fact, many organisations seem to prefer the quality management system as a foundation for implementation of other management systems ([4]). In the past few years, many organizations in Australia and elsewhere implemented environmental and/or safety management systems in addition to their existing quality management system according to International and national standards respectively. There is an increasing trend towards amalgamation of those management systems and to use them as an integrated management system framework ([19], [20], [21], [22]).

A closer look at the ORM systems discussed here has revealed that all the systems share the same PDCA improvement methodology as their underlying concept. This is not surprising as most commonly used business improvement methods and concepts including TQM and Six Sigma share the same roots as well.

4. The proposed ORM Framework

The effectiveness of an ORM system depends not only on the awareness of the importance of the various elements of that system but also on their state of deployment or practice within the organisation.

The Figure 2 depicts the elements of a proposed ORM framework that has been developed on the basis of the International quality management system standard ISO 9001 and incorporates various other management system standards and guidelines including AS/NZS 4360, ISO 14001, AS/NZS 4801, and COSO ERM.

The elements can be grouped in three distinctive groups: Top Management, Process Management and Human Resource Management. Sub-elements in the group Top
Management include: ORM policies and objectives, top management commitment and support, encouragement and recognition of employees, reviews of the ORM performance, allocation of resources and infrastructure. The sub-elements planning and strategic alignment, risk management process, implementation and monitoring, continuous improvement, information and documentation belong to the group Process Management. Finally, the group Human Resource Management consists of the sub-elements training of employees, performance appraisal, employee involvement, empowerment and motivation, culture, and communication.

The elements shown in Figure 2 are not stand-alone or disjointed. Those elements are interconnected and interact with each other to determine the effective use of the proposed ORM framework. These elements are discussed further as follows.

**Top management**

Top management is a crucial factor of any ORM system. Many management systems studies have identified that the effective use of a management system was directly associated with the role and attitude of top management in the organisation ([23], [24], [25], [26], [27], [28], [29]). The main role of top management is to provide leadership and commitment to the ORM by defining the ORM policy, integrating the ORM aspects into organisational decision-making, providing adequate resources for deployment and maintenance of the ORM system, assigning responsibilities and reviewing organisational risk performance. In addition, top management also need to ensure that ORM policy is understood, implemented, and maintained at all level of the organisation.

**Process Management**

Every system is made of many processes that interact with and influence each other. These processes have to be carefully managed to ensure the effective use of the ORM system. The planning process itself is one of these critical processes and provides great potential for identifying and controlling other processes ([30]). ORM strategies and plans should be established and consistent with ORM policy and aligned with strategic plans. According to AS/NZS 4360, a risk mitigation process is central to the ORM system. It usually consists of the steps identifying, assessing and controlling the risk. It is a problem-solving approach in which problems are recognized, prioritized, and acted upon to resolve them. As a result, the ORM system should be integrated with other management systems in the organisation. It is also important for organisation to identify key risk performance measures and conduct regular audit. Results of performance reviews and audits need to be used for continuous improvement. Furthermore, information system should be used to monitor risk management activities and documents should be controlled.
Human Resource Management

Employees’ involvement in ORM is included in most ORM guidelines and practices. However, the involvement of employees requires appropriate knowledge of the various elements of the ORM system. It is necessary for an organisation to provide proper training and education to all employees.

![Figure 3: Process Approach of Managing Operational Risks](image)

Competence of employees for handling operational risks also need to be regularly evaluated and feedback of their performance should be provided by their superiors. It is also important for organisation to reinforce the implementation of risk culture and empower employees to actively manage risk. This usually helps improve employee satisfaction and productivity ([25], [27]). Moreover, there should be a two-ways communication between employees and management regarding ORM matters to ensure the correct decision made all the time ([23]).

5. Discussions and Future Research

Many researchers have empirically studied the critical success factors that influence the effective use of management systems including quality ([23], [27], [28], [29], [31], [32], [33]), environment ([26], [34]), and safety ([24], [35]). However, there is a need for study of critical success factors relevant to the effective use of ORM systems.

In this research, a Six Sigma tool called Input-Process-Output diagram has been used to illustrate the research framework. An empirical study will be conducted to investigate the relationship of ORM elements on effective use of ORM system to manage operational risks. Questionnaire instrument will be used to collect opinions and current practices of using ORM system to manage operational risks. A questionnaire has been developed based on previous research on operations management systems. As the next step of this research, the questionnaire will be distributed to expert for verification and validation and will be modified if necessary. The target group for this study is a selected group of large and small Australian organisations in manufacturing and non-manufacturing sectors.

6. Conclusions

The implementation of one or more management systems is usually considered as a proactive approach of an organisation to reduce risks in operations. However, further study is needed to verify that these systems are also effective in handling the operational risks. In this paper, a conceptual framework for study of the effectiveness of the currently used ORM systems in Australia has been introduced. Various types of operational risk management systems currently used in Australia were also discussed. As final part of this research, the proposed model will be tested and the results published at the next OSCM conference.
References


