

## ENTERPRISE RISK MANAGEMENT, VALUE CHAIN, AND LIFE CYCLE COST: HOW THE THREE CONCEPTS ARE ADOPTED TO INCREASE COMPETITIVENESS

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### Abstract:

Enterprise Risk Management (ERM), Value Chain (VC), and Life Cycle Cost (LCC) are three crucial concepts in running an effective company. Hence, no specific study has been done to identify how those concepts were implemented in companies in Indonesia. Thus, the study objective was to identify types of ERM used by the companies, how they connect the ERM to VC and LCC, and how effective the combination of the three concepts to enhance companies' competitiveness was. The study data were collected through focus groups discussion and interviews. This study involved some scholars and selected professionals who were the senior management of corporations listed in IDX. The FGD and interview results were analyzed qualitatively through an interactive data analysis model. The study found that most companies applied the ISO 31000 as their ERM. The respondents agreed that ERM was used as the basis for setting and managing prices that support the implementation of VC and LCC. Besides, they also believed that the integration of the concepts was effective in increasing competitiveness. Since this study was conducted qualitatively, the result of the study needs to be supported by a further study using a quantitative approach to strengthen the result of the study so that it can be generalized to a bigger population.

**Keywords:** Company Competitiveness, Enterprise Risk Management, Life Cycle Cost, Value Chain.

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## INTRODUCTION

Risk management is the process of identifying, analyzing, evaluating, controlling, and trying to minimize as much as possible or even eliminate the risks faced by business owners (Soltanizadeh et al., 2014). Risk management is applied by entrepreneurs to prevent losses that harm the company. Risk management is very important to be applied by an entrepreneur to face a world full of possibilities and uncertainties in a very dynamic business climate (Roper & Tapinos, 2016). No organization or business can avoid various business dynamics and problems. No business is free from uncertainty and problems. Either technical or non-technical. Therefore, entrepreneurs must be prepared to face the various challenges and dynamics that confront them. This risk management is a defense tool for business owners from the various problems.

Risk can be defined as an adverse event or the possibility that the results obtained will deviate from expected results (Miller & Jones, 2013). If the risk occurs in an organization, it may harm the organization. In the worst possible situation, the risk could destroy the organization. In general, risks can be grouped into pure risk, namely risk with the possibility of loss but no possibility of profit, and speculative risk, which is the risk where we expect losses and profits (Ostrowska & Mazur, 2015). In addition to pure and speculative categorization, risk can also be distinguished between dynamic risk arising from changes in certain conditions (changes in community conditions, technological changes, which can give rise to new types of risk) and static risk arising from certain equilibrium conditions (practically risk does not change from time to time) (Paltrinieri & Khan,

2020). Risk can also be grouped into subjective risk, risk related to one's perception of risk, and objective risk, risk-based on objective parameter observations (Santeramo & Lamonaca, 2021).

Considering that many risks must be faced, a company must manage risk. Risk management aims to manage these risks so that the company can obtain optimal results (Sprčić et al., 2015). If a company cannot manage risk properly, then the company has a high tendency to suffer losses (S. Ahmad et al., 2014). Therefore, the risks faced by the company must be managed so that the company can survive. Unfair competition, especially price competition, is one of the risks companies often face and must be anticipated (Rothenberg et al., 2016). The price of a product tends to be a factor that influences customer interest in buying a product (Dost & Geiger, 2017). So this means that price is something that can affect the competitiveness of a company (Bauner & Wang, 2019). For this reason, in determining the price of a product or service, the company will perform various calculations.

Calculations performed to determine product prices are usually carried out by considering the value chain and life cycle costs. Value chain (VC) is a series of business activities that can increase the value of utilization of the goods or services produced at each stage or step (Brennan & Rakhmatullin, 2017). So VC analysis is a process in which a company identifies the main and auxiliary activities that add value to the product, then analyzes them to reduce costs or increase differentiation. VC Analysis is a strategy used to analyze the company's internal activities. In other words, by looking into internal activities, the analysis reveals where a company's competitive advantages or disadvantages lie (Levy & Powell, 2005). Companies that compete through differentiation advantage will perform activities better than competitors. If it competes through cost advantage, it will try to perform its internal activities lower than competitors. When a company can produce goods at a lower cost than the market price or deliver superior products, it earns a profit.

Meanwhile, Life Cycle Cost (LCC) is the cost required by a building during its design life (Padgett et al., 2010; Wang, 2018). These costs include planning and construction costs called initial costs, costs for routine maintenance and repairs called maintenance costs, and costs for demolition and recycling of unused materials (Knauer & Möslang, 2018). This is done when the building can no longer function. LCC identifies product costs from the research and development stage, which begins with identifying the needs/tastes of the community, then the production stage and the post-production stage known as logistics costs, such as transportation costs, advertising, distribution, and guarantees (Korpi & Ala-Risku, 2008). The costing made on the LCC can provide information and benefits on how the product will be in the future if the product is no longer produced.

Considering that risk management, VC, and LCC have an important role in running a company. Thus, this research aims to identify how to implement these three concepts to increase competitiveness. Specifically, this research aims to identify the types of ERM used by the companies, how they connect the ERM to VC and LCC, and how effective the combination of the three concepts enhanced companies' competitiveness.

**Enterprise Risk Management (ERM).** ERM is the leading approach to managing and reducing risks, enabling a company to determine how much uncertainty and risk are acceptable to an organization (Malik et al., 2020). ERM serves as a strategic analysis of risk throughout an organization, cutting across business units and departments and considering end-to-end processes (Meidell & Kaarbøe, 2017). In adopting an ERM approach, companies gain the ability to align their risk appetite and tolerance with business strategy by identifying events that could leverage them to capitalize on the opportunities while managing its adverse effect and then developing an action plan to manage them (Alijoyo, 2020, p. 1).

A company could follow various ERM frameworks – all of which should define the essential components, suggest a common language, and provide clear ERM guidance. Besides, each implemented framework should also describe an approach for identifying, analyzing, responding to, and monitoring risks and opportunities facing the enterprise (Dehmer et al., 2015; Rodrigues-da-Silva & Crispim, 2014). As further elaborated by Arena, Arnaboldi, & Azzone (2011), the role of ERM falls into two critical characteristics, namely (1) the characteristics of comprehensiveness that covers every different risk categories, and (2) the integration characteristics orienting on the ERM role that

encompasses every line of business, functional areas, and its influence within a company. Within this context, ERM coexists within the corporate governance scope that covers the role of the company's internal audit, internal control, and financial reporting (R. A. R. Ahmad et al., 2015; Cao et al., 2015; Hoyt & Liebenberg, 2011; Spira & Page, 2003). Design enables the company to cope with its internal control issues and bring added value to its stakeholders (Renault et al., 2016). Among the more widely known frameworks and/or standards, the related ERM definitions they promulgate are COSO ERM Framework (COSO) and ISO 31000 Risk Management Principles and Guidelines (ISO 31000).

Risk management has several important objectives that support a company to survive and achieve its goals or visions and missions. There are at least four objectives of risk management as follows:

**Protecting the Company.** As discussed earlier, the concept of risk management emerged to protect a business to survive the various challenges and problems that every company must face (F. De Florio, 2011). Every business challenge and the problem can impact different levels, from low to high. This risk management is made to reduce the risk that the company must accept. Thus, the loss or risk that the company must bear can be minimized to the lowest possible level. Entrepreneurs can determine how much risk they can tolerate.

**Assisting in Framework Creation.** The existence of risk management will greatly facilitate business owners to create a corporate framework (Borek et al., 2014). A risk management objective is an assumption for an effective and efficient work system for business owners or management. For example, the existence of risk management makes business owners create SOPs in such a way as to prevent financial loss. Employers can also make sanctions if conditions are detrimental to the company.

**Improving Business Performance.** The existence of risk management will automatically encourage business owners or management who have been given the authority to act proactively to reduce the risk potential. With an ongoing control system, management will find it very easy to find problems in the field, which in the future can be used as material for continuous evaluation and improvement (Quon et al., 2012). This condition will encourage the company's performance to be more effective and efficient. Indirectly, the company's competitiveness will also be stronger.

**As a reminder.** Risk management can also remind every business element to be careful every time they carry out their work. This caution will reduce the risk of work process errors that can impact losses both in time, energy, or financially (Johnston & Soileau, 2020).

**Value Chain (VC).** Value chain analysis is when a company identifies the main and auxiliary activities that add value to the product, then analyzes them to reduce costs or increase differentiation. Value chain analysis is a strategy used to analyze the company's internal activities (Brennan & Rakhmatullin, 2017). In other words, by looking into internal activities, the analysis reveals where a company's competitive advantages or disadvantages lie. Companies that compete through differentiation advantage will try to perform activities better than competitors will. If it competes through cost advantage, it will try to perform its internal activities lower than competitors. When a company can produce goods at a lower cost than the market price or deliver superior products, it earns a profit.

Value chain activities are divided into main activities and supporting activities. In the main activity of the value chain, there are activities (Dorri et al., 2012). Inbound Logistics is an activity that refers to the process of transportation, storage, and delivery of goods that enter the business (Knoll et al., 2016). Then the main activity contained in the value chain, namely Operations, is an activity related to converting inputs into outputs in the form of certain goods or products through a productivity process by considering the completeness of production support equipment. Then there are Outbound logistics activities, which are activities related to receiving goods from production, storage, and distribution of products to consumers or buyers (G. H. Gessinger, 2009). In addition, in the main activity of the value chain, there is Marketing and sales, which is a method used by companies to influence the market or consumers to buy their products. Then the main activity of the

next value chain is service, which is a series of production activities that includes providing services to maintain and increase the value of the products offered.

In value chain support activities, firm infrastructure activities consist of departments or financial functions (accounting, finance, planning, and so on) that serve the organization's needs and bind the parts into a single unit. Furthermore, there are Human resources management activities, namely a series of activities in recruitment, training, compensation, and work culture. In addition, there are Technology development activities as a technology development tool to produce a product that has a selling value in the market. The technology needed in a company includes developing equipment, software, hardware, and procedures in the transformation of products from input to output. Then in the last value chain support activity, there is Procurement activity, namely the process of purchasing material resources and other inputs, which are used in the value creation process in all activities.

**Life Cycle Cost (LCC).** According to Chu and Hakim (2015), LCC is a technique that allows a comparative cost assessment to be made over a certain period, taking into account the initial capital investment and future operating costs. In addition, Sesana & Salvalai (2013) said that LCC evaluates various cost elements, particularly the materials and components used, such as energy, water consumption, and overall asset performance. LCC is composed of initial costs, maintenance, and operational costs, replacement and replacement costs, and salvage value.

LCC analysis is an important design process in controlling the initial and future costs of owning an investment project. In planning LCC, we need to know the service life of the components of the building materials used. This is something interesting because so far, the service life assessment has only been carried out on a building as a whole. Service life is the service life of a building material component. Determining service life aims to facilitate calculations in the maintenance phase and replacing building material components that have passed the service life limit.

## METHODS

Considering the study's objective, this study can be classified as qualitative research following grounded theory research. This type of qualitative research is done to construct a theory based on the respondents' views on the studied problems (Creswell & Creswell, 2018). To collect the data, the researchers collected data from focused group discussions (FGD) with some scholars and interviews with selected respondents who sit at senior management of corporations listed in IDX. The data from the FGD and interview were analyzed qualitatively using an interactive data analysis model that consisted of three steps: data reduction, data display, and conclusion drawing or verification (Miles & Huberman, 2014). First, all collected data were selected based on the criteria to ensure that the data were valid or met the study's objective. Second, the researchers grouped the data based on the focuses of the study and coded the data. Third, the researchers concluded the data to answer the research questions or the study's objectives.

## RESULT AND DISCUSSION

**Types of ERM Used by the Companies.** From the FGD results, it was found that most of the companies that were sampled used ISO 31000 in implementing ERM. The managers of these companies stated various reasons why they chose ISO 31000, as shown in Table 1. In general, the reason is that ISO 31000 has proven effective to be implemented as an ERM. In addition, ISO 31000 is a national standard in Indonesia and has been used as an ERM standard in more than 50 countries in the world. This shows that ISO 31000 is internationally recognized. The same thing was also found from the interviews, where company managers stated that more of them adopted ISO 31000 for various reasons similar to the reasons found during the FGD implementation.

From the results of previous studies, the application of ISO 31000 has been proven to be able to identify the risks faced by companies (Lalonde & Boiral, 2012; Nabawy et al., 2021). By knowing the risks that will be faced, anticipatory steps can be taken to improve the company's performance

(Asmarawati & Prince, 2021; Lalonde & Boiral, 2012). Furthermore, if the company's performance increases, the profits obtained by the company will also increase (K. Paul, 2014). In other words, it can be said that ISO 31000 can bring many positive impacts for companies. Compared to COSO ERM, company managers practically feel that ISO 31000 is easier to implement.

**Table 1. ISO 31000 or COSO ERM Adoption**

Method of Data Collection	Results
<b>FGD</b>	<p>ISO 31000 is the official risk management standard in more than 50 countries.</p> <p>Implementation of ISO 31000 increase efficiency and encourage proactive management,</p> <p>Improve the performance and resistance of the management system to be able to build shareholder trust</p> <p>Protect the company from risks due to changes that occur effectively</p> <p>Increase the probability of achieving the target</p> <p>Provide analysis of opportunities and threats to identify and manage risks better</p> <p>Able to provide reliable information for decision making and planning,</p> <p>Help predict difficult situations in the future, so that preventive measures can be taken before risks arise,</p> <p>Improving the ability of businesses to carry out their business in a sustainable manner</p> <p>ISO 31000 has already been declared as the national standard of Indonesia by the National Standardization Agency of Indonesia</p>
<b>Interview</b>	<p>COSO has some good points, but overall he finds it complicated and heavy</p> <p>To ensure effective risk management, ISO clearly states eight principles that must be met while COSO does not. The eight principles include integrated, structured, and comprehensive, according to organizational needs, inclusive, dynamic, based on the best available information, and continuous improvement considering human and cultural factors.</p> <p>Clarification of the level of implementation of management is explicitly stated in COSO, while ISO is not clearly stated. COSO states that the risk management framework must be applied comprehensively at the global level of organizational entities and divisions, business units, and subsidiaries.</p> <p>COSO has over 100 pages, while ISO 31000 can be read in under an hour.</p>

**How the Companies Connected the ERM to VC and LCC.** When discussing how companies relate the concept of ERM to VC and LCC in the FGD, it was found that ERM is the foundation of the implementation of VC and LCC. From the results of the FGD, it can be conveyed that the company managers believe that without a good ERM, the implementation of VC and LCC will not be able to succeed optimally. They believe that a good ERM implementation will increase the trust of investors and stakeholders, which will automatically build the value of the company. What is more, it is said that the orientation of VC is to solve problems and make decisions. By knowing the risks that will be faced, the company manager will make decisions to solve the problems faced better. In other words, ERM will support the comprehensive implementation of VC and LCC. Likewise, the results of interviews show that ERM has a very important position in increasing company value and is important in calculating LCC. Based on the interview results, the respondents stated that ERM could not be separated from all activities carried out by the company, especially in terms of VC and LCC.

This is also supported by empirical data, which states that the presence of risk has been shown to harm LCC so that an effective ERM is needed (G. Craighead, 2009; Flanagan et al., 1987). Risk analysis is mandatory to be carried out in the preparation of LCC to avoid things that are not desirable (Babashamsi et al., 2016; Padgett et al., 2010). Likewise, with VCs, ERM will assist VCs in

ensuring that the company can achieve the expected value by building investor and stakeholder trust (Sayari & Marcum, 2018).

**Table 2. The Opinion on Value Chain model and Life Cycle Cost approach implementation**

Method of Data Collection	Results
FGD	Most companies adopt the VC concept, and most companies also use the LCC approach. The difference between one company and another is the depth and details of the analysis and the sophistication and digitalization of their platform to conduct such analysis – the primary definition of VC orients on problem-solving and decision-making activities.
Interview	The concept of Value Chain and the approach of LCC would not be workable if we could not identify and analyze the risk factors in the whole exercise. A contingency perspective should be embedded, and the value at risk needs to be visualized to help marketing set / determine the company's product or services value proposition. In that sense, we need to consider risk management approaches in the whole exercise of VC and LCC. ISO 31000 or COSO ERM Framework is considered to make our integrated risk management work in the product/services costing/strategy.

**How Effective the Combination of the Three Concepts to Enhance Companies' Competitiveness was.** Based on the results of the FGD, it was found that the integration of the three concepts is seen as being able to increase the company's competitiveness. The respondents agreed that a good ERM would strengthen the company in facing challenges. By having the strength to face challenges, the company will compete. When viewed from the VC perspective, respondents also believe that VC will increase the value of the company, which can increase investor interest in investing in shares. Likewise, with LCC, respondents think that LCC will help companies determine the price of products or services to be sold. The results of the FGD were also supported by the results of the interviews, which also showed the same thing. Respondents interviewed also said that good competitiveness would be created with good integration of ERM, VC, and LCC. They state that good ERM will prepare the company to face uncertainty, especially in this digital era. They also said that by implementing good VC, the company would be increasingly recognized for its existence. Furthermore, with a good LCC analysis, the price of the product or service being sold can be determined properly to compete in the market.

The findings from the results of the FGD and interviews are in line with the opinion of Saeidi et al. (2019), which states that ERM is believed to be able to shape the company's competitiveness. One of the things that make ERM able to increase competitiveness is the ability of ERM to improve company performance (Mohammed & Knapkova, 2016). In addition, ERM can also increase the company's resilience from all threats that may occur in the future to realize long-term competitiveness.

**Table 3. The value of ERM to the longer-term company's competitiveness**

Method of Data Collection	Results
FGD	ERM is to help a company keep alerted both to the upside and downside risks related to their long-term goal and objective through its strategy. It means they must have set their risk appetite and then translated it down to its capacity and capability at a business process level, both to deal with today's challenges and the future. The ERM will help organizations point out what is needed to have sufficient organizational resilience against the turbulences as early as possible and avoid the crisis from occurring. It also helps the organization look ahead to what to embrace to be sustainable, as their value proposition and costing strategy and its operationalization through the VC model and LCC approach.

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It is relevant as uncertainties and risks are rising in the digital world. They must be well-addressed explicitly and thoroughly by an organization that adopts the VC model and LCC approach. An organization's supply chain has been radically changed both in its structure and elements due to digitalization, where borderless and timeless are today's norm.

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**Interview**

The role of ERM even becomes more critical in the digital world, where the value chain becomes more data-driven. It has changed the structure of costs which has been swinging dramatically from brick-and-mortar value chain to the most online value chain paradigm. If the new paradigm is not well-addressed by an effective ERM, it could cause an upside risk and a downside risk. As a result, the exploration should be done at no time or simultaneously with the elaboration, execution, and exploitation.

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## CONCLUSION

The study discovers that most companies in Indonesia adopted the ISO 31000 for their ERM. This study confirms that the role of ERM using ISO 31000 is crucial for the competitiveness of a company that adopts the VC model and LCC approach. Moreover, ERM is critically required due to many rising uncertainties and risks along with the value chain of the organization that needs to be identified, analyzed, evaluated, and treated accordingly and consistently through ERM. As such, ERM helps an organization increase organizational competitiveness by reducing the likelihood of an event risk, which will reduce the cost of operationalization and increase the capability and capacity of the organization to exploit the opportunity. Since this study was done qualitatively, a further study that applies the quantitative method needs to be conducted, especially to prove the result of this study quantitatively.

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