Jurnal Aplikasi Bisnis dan Manajemen (JABM), Vol. 11 No.1, January 2025
Permalink/DOI: http://dx.doi.org/10.17358/jabm.11.1.275

Available online
http://journal.ipb.ac.id/index.php/jabm

WORK BREAKDOWN STRUCTURES VS. BUSINESS PROCESSES: AN INVESTIGATION OF APPROPRIATE METHOD FOR IDENTIFYING THE NUMBER OF RISKS

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Article history:
Received
16 May 2024

Revised
12 July 2024

Accepted
30 October 2024

Available online
22 January 2025

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Abstract:

Background: Risk identification is a critical first step in the risk management process, laying the groundwork for subsequent stages like analysis, assessment, mitigation, and monitoring. Accurate identification is crucial to ensure that identified risks align with the company's specific context
Purpose: This research aims to investigate how knowledge and understanding of various risk identification techniques influence the number of risk events identified by practitioners.
Design/Methodology: An experimental approach was employed, involving 84 business school students. The study measured the dependent variable number of risks identified against independent variables comprising different risk identification approaches, both with and without context knowledge. Data analysis utilized the Chi-square technique of non-parametric statistics, maintaining a 95 percent confidence level.
Findings: The findings reveal a significant correlation between the methods of identification approach (with or without knowledge of risk context) and the number of risks identified. Participants using the Business Process (BP) approach, regardless of context knowledge, identified more risks compared to those using the Work Breakdown Structure (WBS) approach or a No approach (NT).
Conclusion: The findings highlight the importance of selecting appropriate risk identification methods and underscore the value of context knowledge in enhancing risk identification effectiveness. This research provides actionable insights for practitioners, analysts, and decision-makers actively engaged in risk management.
Originality: This study contributes to the field by emphasizing the role of risk identification approaches and contextual knowledge, providing a framework for improving risk management practices.

Keywords: risk identification, risk context, experiment approach, and risk knowledge

How to Cite:
Sari M. R., Kountur R., Manue lB., & Ahmad A. (2025). Work Breakdown Structures Vs. Business Processes: An Investigation of Appropriate Method For Identifying The Number of Risks. Jurnal Aplikasi Bisnis Dan Manajemen (JABM), 11(1), 275. https://doi.org/10.17358/jabm.11.1.275

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INTRODUCTION

Every day, organizations experience competitive pressures and uncertain future conditions (Singh & Hong, 2020). Increasing uncertainty gives higher expectations to stakeholders, and on the other hand, company management must also meet better corporate governance requirements. Such conditions signify that companies face extensive challenges that may significantly impact their operational outcomes (George, 2020; Hardy et al. 2020; Hardy & Maguire, 2016; Kountur, 2018).

In dealing with this, it is expected that each company will develop a business strategy as much as possible to achieve competitive advantage. Therefore, the challenge is to develop a business strategy in conditions of business risk that are not well understood by management (Lima et al. 2020). Risk management has been widely studied in practice (Aboutorab et al. 2022; Rasheed et al. 2022; Singh & Hong, 2020; Ziana & Charles, 2022), but in the process there are still many companies that are not clear in identifying potential risks and effective response mechanisms (Kilubi, 2016; Kurniawan et al. 2017). Therefore, it is very important for every organization to be able to implement all risk management steps correctly.

Risk management encompasses processes for identifying, assessing, and mitigating risks that could jeopardize company operations. In most cases, risks are only considered from a project management perspective or from a financial, market, insurance, and other general business perspectives (Aboutorab et al. 2022; Ameyaw & Chan, 2015; Fitriana & Wardhani, 2020; Hartono et al. 2021; Liu et al. 2018; Osei–Kyei et al. 2022; Zhang et al. 2019). The main failure in effective risk management is the level of accuracy and level of risk identification (George, 2020; Hardy et al. 2020; Hardy & Maguire, 2016). The risk identification and assessment stages have a major impact on the accuracy of any risk assessment. However, in reality, in the risk identification process there are also risks, namely the risk of not identifying the risk or errors in identifying the risk (Aboutorab et al. 2022; Liu et al. 2018; Osei-Kyei et al. 2022; Zhang et al. 2019). Failure to identify risks often occurs due to a lack of knowledge or understanding of the risk object and a lack of mastery of the problem in the context of existing risks. Hence, there is a need for practical and accurate risk identification methods to address this gap.

Risk identification has its own challenges in the risk management process. A risk can be easily identified, but it can also be hidden. Risks that are easily identified are usually risks that have emerged or occurred in the past and may still occur in the future. Meanwhile, hidden risks usually have not occurred in the past or the risks are not realized so they are difficult to identify. Hidden risks make risk management ineffective in managing them. Undetected risks can also be caused by various factors such as the competence of the individual who performs the identification or the inaccuracy of using the identification method.

This research still needs to be done because considering the many organizations that face competitive pressures and uncertain future conditions, causing great challenges in managing business risks effectively. Several previous studies have discussed risk management, but it is undeniable that many companies still have difficulty in identifying potential risks and designing effective response mechanisms for these risks.

Therefore, there are two risk identification approaches used in this study, namely the work breakdown structure approach and the business process approach. Previous studies have discussed risk management from a general perspective such as financial aspects, project management and insurance, this study specifically explores how the work breakdown structure and business process approaches can affect the effectiveness of identifying risks. In addition, this study also uses an experimental approach by involving respondents in tests designed to evaluate their ability to identify risks using both approaches to produce more measurable empirical data. While previous studies were more theoretical and descriptive (Aboutorab et al. 2022; Ziana & Charles, 2022; Rasheed et al. 2022; Fitriana & Wardhani, 2020). Thus, this study attempts to provide a new contribution by focusing on risk identification techniques that can increase the accuracy and relevance of risk in a business context.

Referring to this perspective, this study focuses on two main questions, namely: (1) how the risk identification process should be carried out, so that the level of risk identification is higher and (2) how effective the risk identification method through the business process approach and work breakdown structure in is identifying a number of risks. Thus, the research purpose of this study are (1) to determine the risk identification process that can increase the level of risk identification higher

in the organization, (2) to evaluate the effectiveness of the risk identification approach through the work breakdown structure (WBS) and business process (BP) methods in identifying the number of existing risks, (3) to produce practical recommendations for managers and practitioners in implementing more effective and relevant risk identification techniques. In testing this research question, the researcher first conducted a series of studies and designed experimental cases related to potential risks that would occur. Then, empirical testing was carried out on the experimental respondent data. After that, the researcher summarized the findings and discussed their implications.

METHODS

The research is an experimental study. The dependent variable is the number of risks identified, and the independent variable is the risk identification approaches with and without knowledge of the context. There are four treatments of the independent variable they are business process approach with knowledge of the context, business process approach without knowledge of the context, work breakdown structure approach with knowledge of the context, and work breakdown structure approach without knowledge of the context.

The sample consisted of 84 first-year business students from a leading business school in Indonesia. They are selected conveniently; however, they are assigned into group of treatment randomly. The chi-square method, a non-parametric statistical technique, was applied with a 95% confidence level. The non-parametric statistic is used since the variables are in nominal form. The control variable is Knowledge of the Context. It is a nominal variable with two categories, having knowledge and having no knowledge. Research subject was categorized as having knowledge if he/she reached the score > 50%. Otherwise, he/she would be categorized as having no knowledge. Number of risks identified is categorized into three categories, high (more than eight risks identified), average (between four and eight risks identified), and low (less than four risks identified). More details can be seen in Table 1.

Risk management practices are mostly carried out by managers in an organization but are not limited to managers alone but can be in any profession. The ability to identify risks is a cognitive ability, namely an ability that is only possessed by the individual as a person, not an organizational ability. Therefore, in this study the respondents we used were students who met the criteria as samples. We chose business master's program students as respondents because business students have a strong business knowledge background, have basic knowledge in analyzing information and already have work experience. Work experience is needed because it will strengthen knowledge of risk objects.

The work breakdown structure and business process approaches have been widely studied for the effectiveness of the framework in reducing the level of risk in project management (Elsye et al. 2018; Jakoubi et al. 2009, 2010; Lamine et al. 2020; Limon & Crozet, 2017; Marchewka, 2015; Sienou et al. 2006; Supriadi et al. 2017). The work breakdown structure is a tool in project management that is used to divide a project into smaller parts to make it easier to manage. The work breakdown structure forms a hierarchy that completes all tasks that can be completed and tasks that need to be completed to achieve organizational goals. By breaking down a job into smaller elements, it is hoped that organizational managers can more easily map and manage all elements that can affect the organization's financial performance, thereby recognizing financial risks more easily and systematically. In this study, researchers believe that the work breakdown structure can be used as one approach to identifying more accurate financial risks. The work breakdown structure allows for the identification of financial risks in all financial elements such as revenue, costs, investments and funding sources. The work breakdown structure can also specifically show how financial risks are interrelated. For example, the risk of overly optimistic revenue projections or higher-than-expected costs. By dividing financial elements into smaller parts, managers can more easily identify, analyze and plan responses to financial risks, thereby increasing the chances of the organization's financial health.

In contrast to the work breakdown structure approach, the business process approach emphasizes the workflow or stages in an organization's business process. In this approach, each step in the business process is analyzed to identify potential risks that may occur. With the business process approach, risks are identified based on the potential for failure or disruption in the business process flow. For example, risks can arise from inaccuracies in recording financial transactions, errors in financial reports or due to non-compliance

with accounting standards. More specifically, errors in revenue recognition will cause the risk of inaccurate income statements which can potentially cause the company's value to be overvalued or undervalued. Or errors in cash flow planning will cause a shortage of cash to cover operational expenses. This approach emphasizes an in-depth analysis of how each workflow is related to finance, from recording transactions to managing the organization's liquidity. Each workflow in the financial process is analyzed to find vulnerable points that can cause financial losses.

In general, the business process approach focuses more on the flow and interactions in the business that can cause risks. While the WBS focuses more on how risks can arise from the implementation of certain work in the organization. In this study, researchers hope that one approach can identify more hidden risks. Apart from these two approaches, researchers also consider the variable knowledge of risk objects in the risk identification process. Effective risk management must be based on a clear understanding of risks and their potential impacts. Knowledge regarding this risk object is needed to understand the process of developing a hazard into a worse impact/consequence. Knowledge or understanding of the risk object will increase the probability that many risks can be identified (Hoon Kwak & Dixon, 2008; Maytorena et al. 2007; Nydén & Janzon Hägglund, 2022). The level of knowledge can influence the occurrence of a risk, a low level of knowledge about the object of the risk will only make the risk even more hidden. Sufficient knowledge means risks can be easily identified and mitigated by taking various risk prevention measures.

We hypothesized that (H_1): $f_1 \neq f_2 \neq f_3 \neq f_4$.

Where:

f_1 = the frequency using business process approach with knowledge

f_2 = the frequency using business process approach without knowledge

f_3 = the frequency using work breakdown structure with knowledge

f_4 = the frequency using work breakdown structure without knowledge

Thus, Risk Identification Approach affect the Number of Risks Identified.

Eighty-four students from one of Indonesia's leading business schools were selected. Respondents in each experimental cell were selected randomly. A description of the respondents used as samples for this study is presented in Table 2. Most of the respondents were female (68%) and fewer (32%) were male. Most of the respondents (54%) were in the second semester and 46% were in the fourth semester. In terms of accounting knowledge, the range is quite wide, between 3 and 21 with a maximum score of 25. This also applies to the number of risks identified with a range between 1 to 11 and a maximum of 11.

Of the 84 respondents, each respondent will be grouped into 4 different groups randomly. The first group in cell one is the group taught the business process approach without having knowledge regarding the risk object, the second group in cell two is the group taught the business process approach without having sufficient knowledge regarding the risk object, while groups 3 and 4 are the groups taught work breakdown structure approach with and without having knowledge regarding the risk object.

Table 1. Variables description

Type	Name	Symbol	Measurement Method
Independent	Number Risk Identified	Y	The count of risks identified by respondent
Treatment	Risk Identification Approaches	X	Three categories of treatment: Work Breakdown Structure, Business Process, and placebo
Control	Knowledge of Context	C	Multiple choice test

Table 2. The description of the sample

Variable	Category	Freq.
Gender	Female	57
	Male	27
Semester	2	45
	4	39
Knowledge in Finance & Accounting	0-07	18
	08-15	47
	16-23	19
The number of identified risks	0-2	29
	3-5	42
	6-8	11
	9-11	2

The respondents in this study were also business students who had not taken a risk management class before, so it is certain that each respondent in this study did not have risk identification technique skills. To test the respondent's ability to identify risks, a short business case related to the accounting unit/department in a company was prepared. Respondents were asked to position themselves as accounting managers and were asked to identify as many risks as possible that they would face. Before the respondents identify risks, each respondent in the cell will be given treatment or taught the risk identification approach as follows, the business process approach for cells 1 and 2, and the work breakdown structure approach for cells 3 and 4. And to ensure that each respondent Once they understand the treatment given, they will be asked several confirmation questions regarding their understanding of the two approaches. After being given this treatment, respondents were asked to read the business case provided and identify potential risks that would occur in the relevant unit/department. In identifying risks, respondents are given answer sheets that have been arranged according to each approach to make things easier for respondents. After risk identification has been carried out, in the final stage respondents are asked to answer various questions related to the field of accounting, with the aim of measuring the level of accounting knowledge possessed by each respondent.

RESULTS

This experimental study examines a dependent variable measured on an interval scale and an independent variable in nominal form. Data analysis in this study used one-way analysis of covariance (ANCOVA) with a confidence level of 95%. In this study, it was ensured that there were no outliers and missing data that could influence the research results. Next, the analysis continued with a post hoc test with Tukey's HSD test.

A chi-square test of independence was performed to examine the relationship between approaches in risk identification with or without knowledge of the context, and number of risks identified. The relation between these variables was significant, , as shown in Table 3. Business Process approach (BP) with or without knowledge of the context were more likely to identify more risks than Work Breakdown Structure approach (WBS) or No approach (NT) with or without knowledge of the context, see Table 3. As shown in Table 2, two of the respondents that use Business Process Approach and having knowledge of the context were able to identify more than 8 risks (f = 2). While nine of them were able to identify four to seven risks (f = 9), and only few of them (f = 2) were able to identify less than four risks.

Table 3. Experiment Design

		Risk Identification Approach	
		BP (A1)	WBS (A2)
Knowledge	With Knowledge (B1)	A1, B1	A2, B1
	Without Knowledge (B2)	A1, B2	A2, B2

None of the respondents that use Business Process Approach and having no knowledge of the context were able to identify more than 8 risks (f = 0), this is also true with the rest of the categories of risk identification approach (f = 0). Majority of the respondents (f = 18) who can identified four to seven risks are those who use Business Process approach. While those who use Work Breakdown Structure approach only few (f = 9) the same as those who do not use any approach (f = 9). More details can be seen in Table 4 and 5.

The results of the data analysis can be explained as follows:

The group of respondents in panel I, showed the results of using the business process approach with financial knowledge showing a strong ability to identify risks more comprehensively with most of the results showing their risk identification in the average to high category. Namely, there were 2 respondents who were able to identify more than 8 financial risks that might occur, and there were 9 respondents who were able to identify 4-7 financial risks. While in the respondents in panel III, when the business process approach was used but without adequate financial knowledge, there was a significant increase in the number of risks identified in the low category. Or in other words, the number of risks that can be identified is getting lower. This shows that the lack of financial knowledge will greatly affect an individual's ability to identify more significant risks. The panel II respondent group showed the results of the use of WBS with adequate financial knowledge tended to be more likely to identify risks in the low category. Namely, only 4 respondents were able to identify 4-7 risks and as many as 7 respondents were only able to identify 1-3 risks. This suggests that even though individuals have adequate financial knowledge, the WBS approach may be less effective in identifying risks on a large scale. The WBS approach without knowledge resulted in more risks in the low category, with no risk identification in the high category. This suggests that WBS without knowledge is less effective in identifying major risks. In this study, the WBS approach was less effective in identifying financial risks. This is possible because the focus of the WBS approach is task details, so the WBS approach tends to be less specific in addressing potential financial risks and other more abstract financial aspects. In addition, financial risks are not identified at the task level and the WBS does not provide cash flow projections, unexpected costs and budget analysis needed to identify risks. Without these things, individuals cannot see the full picture of potential financial risks, which financial risks will be more difficult to anticipate because the WBS approach only focuses on technical and operational aspects, so that the complex relationships in potential financial risks are very difficult to identify.

This study also tested respondents who were not given any risk identification approach treatment or can be said to be individuals without technical risk identification skills (non-technical approach). The results show that when individuals do not have technical skills but have financial knowledge, their ability to identify risks is average or around 4-7 identifiable risks. And the risk identification results are lower when the individual does not have technical skills and does not have financial knowledge. This shows that the non-technical approach is less able to identify major risks, even with knowledge. Individuals who do not have technical skills and no financial knowledge produce very low risk identification, with most risks falling into the low category. This confirms that the non-technical approach without knowledge is very limited in its ability to identify significant risks.

Knowledge significantly enhances the effectiveness of various approaches in risk identification. When knowledge is used in conjunction with the business process approach, the results are more optimal in identifying more significant risks. The business process approach with knowledge shows the best results in identifying risks compared to other approaches. This emphasizes the importance of knowledge and focus on business processes in identifying larger financial or operational risks. The WBS and NT approaches are generally less able to identify high risks, especially when knowledge is not used. This shows the limitations of both approaches in identifying hidden or large risks without adequate knowledge.

Table 4. Chi-Square Test

	Value	df	Asymptomatic Sig (2-sided)
Pearson Chi-square	30.76	10	0.001
Likelihood Ratio	30.61	10	0.001

Table 5. Risk idenfication approaches & number of identified risk

Risk Identification Approaches	Number of Identified Risks		
	High (> 8 risks)	Average (4-7 risks)	Low (<4 risks)
BP with Knowledge	2	9	2
BP without Knowledge	0	9	6
WBS with Knowledge	0	4	7
WBS without Knowledge	0	5	12
NT with Knowledge	0	4	6
NT without Knowledge	0	5	17

Risk identification is the most important stage in risk management. Without correct risk identification, the risk mitigation process cannot be prepared properly. The higher the risk of not identifying the risk, the more unavoidable the potential loss to the organization is. Issues related to risk identification have become the focus of several studies (Elsye et al. 2018; Lamine et al. 2020; Nydén & Janzon, 2022), because they are related to whether or not project or organizational goals are successfully achieved. Therefore, risk management requires risk identification that is carried out correctly.

In this study, we examine how two risk identification approaches contribute to the accuracy of identified risks. Experiments were carried out in data collection and found that there was a significant relationship between the approach method in risk identification with or without knowledge of the risk context, and the number of risks identified. In this research, the resulting sample group that used a business process approach in risk identification was more likely to be able to identify more risks compared to other sample groups. In these two risk identification approaches, the business process approach can identify more risks on average around 1.57 times compared to the work breakdown structure approach. These results prove that the business process approach is easier to understand and implement in identifying potential risks. The business process approach prioritizes risks being identified first at the lowest level, so that everyone is responsible for their achievements which will affect the organization's achievements. When everyone is aware of potential risks that can affect his or her achievements and the achievements of the organization, risks can be easily identified. The results of this research also prove that knowledge regarding the risk context/object is important in influencing the number of risks that can be identified, because without adequate knowledge or a low level of knowledge of the risk object it will only make the risk even more hidden (Hoon & Dixon, 2008; Maytorena et al. 2007; Nydén & Janzon Hägglund, 2022).

Managerial Implication

In general, risk management is carried out to predict potential dangers that will disrupt company goals. Every potential risk in achieving company goals needs to be carefully identified, assessed and appropriately mitigated, because company sustainability is very dependent on how quickly the company responds to potential risks that arise. The findings of this research indicate that in the risk management process, the risk identification stage has unidentified risks. In other words, risks may be mistakenly identified or may even go undetected.

Failure to identify risks will have an impact on company operations. The approach used in the risk identification process plays an important role in the effectiveness of the number of risks detected. Apart from that, individual abilities and understanding regarding the context and object of risk also need to receive attention, so that identified risks can be understood correctly and mitigated quickly.

The findings of this research indicate that each risk identification approach has an impact on the number of risks that can be identified. In this case, every person in the company needs to increase their knowledge, understanding and skills in carrying out

risk management. With this knowledge, understanding and skills, various potential risks within the company can be mitigated quickly and precisely, so that general company goals can be achieved.

The practical managerial implications of the results of this study are (1) it is important to ensure that everyone who interacts in implementing organizational risk management has adequate financial knowledge, especially in the context of financial risks that may occur. It must be ensured that everyone not only understands technical tasks, but also needs to have a strong foundation in financial aspects, and this can be achieved by training and using financial experts in the risk identification process. (2) in this study, the business process approach proved to be more effective in identifying risks. Organizational management should prioritize the business process approach in identifying financial risks. (3) The WBS approach can be used to identify technical and operational risks. Although the WBS approach is not effective in identifying financial risks, this approach can still be used in handling technical and operational risks. Management can use the WBS approach in managing more structured risks at the task level. (4) In optimizing risk identification, management needs to encourage collaboration between the technical team and the finance team in the risk identification process, because without adequate financial knowledge, the potential for undetected financial risks is higher. Thus, collaboration between a team with a financial background and a team with technical operational expertise will further increase the accuracy of risk identification.

CONCLUSION AND RECOMMENDATIONS

Conclusions

The findings in this research indicate a relationship between the approaches used in risk identification, knowledge of the risk context and the number of risks that can be identified. This suggests that employing appropriate techniques enables analysts to identify risk events more accurately. Moreover, knowledge and understanding of the risk context enhance risk analysis, minimizing the likelihood of misidentification or oversight.

Recommendations

Referring to the results of this research, the following recommendations can be offered. First, it is important for companies to equip all employees with risk management knowledge and skills, resulting in risk mitigation and more informed decision making. Second, this research emphasizes the importance of understanding the context and object of risk. Both of these things should be supported by companies in the form of developing an effective risk management framework to identify and manage risks so that potential losses can be minimized. In addition, companies need to place risk management as the main aspect of organizational management apart from the company's financial performance.

FUNDING STATEMENT: This research did not receive any specific grant from public, commercial, or not-for-profit funding agencies.

CONFLICT OF INTEREST: The author declares no conflict of interest.

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