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Research Article

Analysis of Construction Management Functions in Commercial Building Development Projects in Medan City

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Abstract
Commercial buildings are buildings that accommodate various commercial functions such as villas, hotels, resorts, trade, office space for rent, and others. according to its type, a commercial building is a building that is planned and designed to bring benefits to the owner and its users. On the basis of this premise, the design of commercial buildings considers nine aspects. the factors that must be considered in the construction of commercial buildings and the actions taken so that the construction management function has a significant effect on the success of internal commercial building construction projects project development from its understanding, construction management applies management functions to a project by utilizing resources effectively and efficiently to achieve project objectives. the main objective of construction management is to manage management functions effectively and efficiently so as to obtain optimal results in accordance with the agreement with the project owner. The sampling technique chosen was Interview/Questionnaire and Primary Data. In this study, a sample of25 respondents from several different construction service companies was required. based on Company Status, type of company, company work experience, aspects of work equipment, capital / finance, HR (Human Resources). Analysis of construction management factors in the construction of commercial buildings in the city of Medan. Analysis of questionnaire data taken from 25 respondents was processed with Microsoft Office Excel 2010.

Keywords: Respondents, Analysis, Factors.

INTRODUCTION

Commercial buildings are buildings that function as a means to accommodate business activities that aim to generate profits for owners and users in the short and long term. These business activities include villas, hotels, resorts, trade, rental office space, and others.

In designing a commercial building, there are nine fundamental aspects that need to be considered so that the building not only functions optimally, but is also able to attract and maintain consumer interest in the long term. First, the character or image (brand image) of the building plays an important role in forming a strong first impression. Buildings with distinctive visual characteristics and a clear identity can increase consumer appeal and create added value to the brand being carried.

Second, the aspect of the building's economic value cannot be ignored. Efficiency is the main key in this case, including efficiency in the use of materials, energy, and operational management. Buildings designed with efficiency in mind will be able to reduce costs and increase profitability. Furthermore, strategic location is a crucial factor in determining the success of a building's commercial function. Locations that are easily accessible and in areas with high market potential will increase the likelihood of visits from consumers and create competitive advantages.

The fourth aspect is the principle of building security. As a public building, it is important to ensure that its design meets safety and security standards, both from the risk of fire, earthquakes, to security systems against criminal acts. Security is divided into two main categories, namely physical safety and social security.

Fifth, building comfort is a factor that supports the sustainability of activities in it. This comfort includes various aspects such as thermal comfort (room temperature), good lighting, supportive acoustics, and efficient space circulation. All of these elements must be combined harmoniously to create a pleasant space experience.

The sixth aspect is long-term needs. Commercial buildings should be designed flexibly so that they can adapt to changes in needs and social dynamics that occur in the future. Flexibility in design allows space to be developed or changed according to the demands of the times. Seventh, building design needs to pay attention to the conditions, potential, and character of the area where the building will be built. By understanding the local context, the design will be more in harmony with the surrounding

environment, both visually and functionally.

The eighth aspect concerns the socio-cultural conditions of the community. A successful commercial building is a building that is accepted by the surrounding community, both socially and culturally. Therefore, the design must consider local values, community habits, and the psychological impacts that arise. Finally, building design must be able to accommodate technological developments. The integration of modern building technology, such as automation systems, energy efficiency, and digital information systems, will improve building performance while providing added value to users.

Building materials must be of good quality, it is undeniable that contractors must determine the price aspect or reduce the quality of materials to be included in the budget planning. The low quality and quality of project goods due to the practice of slashing prices or bidding prices below the HPS. Low awareness of the importance of implementing occupational safety and health (K3) among industry and society. Of the 2015 workforce of 121 million, in fact they only learned about K3 problems after entering the workforce. As a result, 98 thousand to 100 thousand cases of work accidents occur each year in Indonesia.

These accidents occur in formal and informal activities, including explosions or fires. Of the 98 thousand, 2,400 people died, not including 40 percent of permanent disabilities, anatomical disabilities and functional disabilities. The quality of workers who work mostly have low levels of education. The average percentage of the level of education of the workforce who did not attend school and did not/completed elementary school was 65.89%, indicating a positive correlation between education level and work productivity. The higher the level of education, the higher the productivity. The main factor causing the delay in the implementation of building construction is the unavailability of labor, due to the culture of planting and harvesting seasons (Messah, 2013).

This study aims to collect and analyze various data and information related to the implementation of construction management in commercial building construction projects in the city of Medan. Through this analysis process, it is expected to obtain a clear picture of the implementation of construction management functions in the project.

Specifically, this study aims to identify important factors that need to be

considered in the construction of commercial buildings in Medan, as well as evaluate managerial actions that can increase the effectiveness and success of construction projects through the implementation of optimal construction management functions.

METHOD

This study uses a quantitative method, which is based on a positivistic approach and aims to test hypotheses through objective statistical data analysis. This method is carried out systematically on phenomena and relationships between variables, using data in the form of numbers collected through surveys of certain population samples. The survey results are then processed to determine the frequency and percentage of respondent responses.

According to Sugiyono (2017), quantitative research is intended to test hypotheses through measurable instruments and statistical techniques, while Kasiram (2008) emphasized that this method uses numbers as the main tool in analyzing information. Some of the main characteristics of the quantitative approach used in this study include the use of deductive logic, being objective, relying on the initial plan, and conducting analysis after the data has been fully collected. The research procedure is carried out through several stages, starting from problem identification, literature study, development of conceptual frameworks and hypotheses, to the final stage in the form of data collection, analysis, and interpretation.

Research Object

In this study, the scope of the research object determined is adjusted to the problem to be studied, namely regarding the function of construction management in the construction of commercial buildings. The research was conducted at companies engaged in the construction sector. There will be 25 respondents from construction companies to answer the prepared questionnaire. Each respondent in one company represents each different position and position. The researcher conducted an analysis of the construction management factors that must be considered in the construction of commercial buildings and the actions taken so that the construction management function has a significant effect on the success of commercial building construction projects.

Population and Sample

In this study, the population used as the object of study is the construction service providers operating in Medan City. This population was chosen because they have characteristics that are relevant to the research objectives. Given the limitations of time, funds, and manpower, the researcher could not reach the entire population. Therefore, a sample was used in the form of contractors who are or have handled construction projects in Medan. This sample was taken as a representation of the entire population for further analysis.

This study uses a non-probability sampling technique with a purposive sampling approach, namely the selection of samples based on certain considerations. This method was chosen because the researcher knows that the information needed can only be obtained from certain groups that meet the criteria. The sample used is individuals who work directly as construction service entrepreneurs or contractors in Medan City.

Data Collection Method

In this study, a literature study was conducted at an early stage to obtain a relevant theoretical basis. Furthermore, a field survey approach and open interviews with contractors were conducted to analyze the implementation of construction management in each company. Data analysis was conducted descriptively to identify construction management factors that must be considered and actions that support the success of commercial building construction projects.

The types of data used include primary data, obtained directly from respondents through interviews and questionnaires, and secondary data collected through literature such as books, journals, and previous research. The data collection process involves two main methods: a literature study to obtain supporting theories and references, and direct distribution of questionnaires to contractors as respondents, with structured questions and available answer choices.

Data Analysis Method

In this study, data analysis was conducted after all data from respondents was collected. The analysis process includes grouping and assessing data based on variables, tabulating results, and calculating to answer the formulation of research problems.

Data processing was carried out by checking the completeness of the data,

grouping answers based on variables, and analyzing them using descriptive statistical methods. The assessment was conducted using a Likert scale, from "Very Uninfluential" (value 1) to "Very Influential" (value 5). Furthermore, the Relative Importance Index (RII) value was calculated to determine the priority of each variable, with the ranking determined based on the highest IKR value. Analysis and ranking were conducted using Microsoft Excel. The measurement scale used was the Likert scale to measure respondents' attitudes, opinions, and perceptions of the construction management function. Meanwhile, the conclusion method was based on the range of average values (mean) to categorize the level of influence of each factor, both on construction management and project success.

RESULT AND DISCUSSION

Analysis of Construction Management Factors that Must be Considered in Commercial Building Construction.

In this study, the results of filling out the respondent questionnaire were obtained and statistical data was obtained on construction management factors that must be considered in commercial building construction in Medan City and the actions taken so that the Construction Management Function has a significant effect on the success of commercial building construction projects. From these data, the most dominant and least influential factors were obtained on the failure of a construction in Medan City.

The output of the data management after being processed with Microsoft Office Excel 2010 contains the following results:

1. Mean rank shows the average level value of each variable. The variable contains Construction Management Factors that must be considered in commercial building construction and the actions taken so that the construction management function has a significant effect on the success of commercial building construction projects.
2. N shows the number of correlated values.
3. Rank shows the order of construction management sub-factors that must be considered in commercial building construction and the actions taken so that the construction management function has a significant effect on the success of commercial building construction projects. In the factor analysis, the ranking value

is obtained from the mean rank generated from the analysis of the Microsoft Office Excel 2010 program. The following is the questionnaire data from respondents that have been collected in table 1.

a. Questionnaire Results

Table 1. Construction management factors that must be considered in the construction of commercial buildings

No	Statement	1	2	3	4
1	Obtaining all the necessary information both in the contract documents and obtained outside the contract documents, namely: a. Field location and its surroundings, both natural conditions and socio-cultural conditions of the local community. b. Resources available at the location and its surroundings.		5	15	30
2	Preparatory work required, for example: work roads, work facilities, offices, base camps, etc.			15	35
3	The order of work implementation is usually seen in the work time schedule.		10	20	20
4	The method chosen to carry out each part of the work, for example: excavation, dewatering, form work system, casting system and others.			26	24
5	Determining the type, composition and number of tools/labor to be used according to the existing or given time limit.			19	31
6	Changes in situations and conditions (changes in building location).		5	20	25
7	Wage costs for all types of existing work.		5	20	25
8	Material costs for all types of materials required by the project.			22	28
9	Tool costs for all types of tools used by the project include: operating costs etc.			20	30

Table 2. Actions taken so that the Construction Management Function has a significant influence on the success of commercial building construction projects.

No	Statement	1	2	3	4

1	Within the scope of the project, limitations containing quantity, quality and specifications are things that need to be considered so that in its implementation it does not result in incorrect implementation between the interested parties, namely between the owner and the service provider.		17	33
2	In project implementation, time and schedule are the main targets of the activity. Delays will result in losses, for example additional costs. Time management includes planning, compiling, and controlling schedules. Cost management includes all aspects related to funds and project activities. In order for management to be effective, various methods and techniques are prepared such as compiling a cost budget, the concept of yield value, and so on.		19	31
3	In project implementation, time and schedule are the main targets of the activity. Delays will result in losses, for example additional costs. Time management includes planning, compiling, and controlling schedules. Cost management includes all aspects related to funds and project activities. In order for management to be effective, various methods and techniques are prepared such as compiling a cost budget, the concept of yield value, and so on.		26	24
4	In order for the project activities to meet the planned requirements, a long process is required, starting from reviewing the implementation requirements, describing these requirements into specifications, and pouring them into working drawings.	5	20	25

b. Questionnaire Data Analysis Results

From the questionnaire results above, the data analysis can be processed using the descriptive statistical method, by analyzing the questionnaire data to determine the mean and then calculating the relative importance index (IKR) value to produce the following data:

Table 3. Results of Construction Management Factors That Must Be Considered in Commercial Building Construction

No	Construction Management Factors That Must Be Considered In Commercial Building Construction.	1	2	3	4	∑xi	*X*	IKR	Information
1	Obtaining all necessary information both in the contract documents and obtained outside the contract documents, namely: Field location and its surroundings, both natural conditions and socio-cultural conditions of the local community. Resources available at the location and its surroundings.	0	5	15	30	175	3,500	0,875	Very influential
2	Preparatory work required, for example: work roads, work facilities, offices, base camps, etc.	0	0	15	35	185	3,700	0,925	Very Influential
3	The sequence of work implementation, usually seen in the work time schedule.	0	10	20	20	160	3,200	0,800	Influential
4	The method chosen to carry out each part of the work, for example: excavation, dewatering, form work system, casting system, etc.	0	0	26	24	174	3,480	0,870	Influential
5	Determine the type, composition, and number of tools/labor to be used according to the existing or given time limit.	0	0	19	31	181	3,620	0,905	Very Influential
6	Changes in situations and conditions (changes in building location).	0	5	20	25	170	3,400	0,850	Influential
7	Wage costs for all types of existing work.	0	5	20	25	170	3,400	0,850	Influential
8	Material costs for all types of materials required by the project.	0	0	22	28	178	3,560	0,890	Very Influential
9	Tool costs for all types of tools used by the project include: operating costs, depreciation costs, maintenance costs, and repairs.	0	0	20	30	180	3,600	0,900	Very Influential

Table 4. Results of Actions Taken So That Construction Management Functions Have a Significant Influence on the Success of Commercial Building Construction Projects.

No	Actions Taken So That Construction Management Functions Have a Significant Influence on the Success of Commercial Building Construction Projects.	1	2	3	4	Σxi	*x*	IKR	Information
1	In the scope of the project, the limitations that contain quantity, quality, and specifications are things that need to be considered so that in its implementation it does not cause wrong implementation between the interested parties, namely between the owner and the service provider.	0	0	17	33	183	3,660	0,915	Very Influential
2	In project implementation, time and schedule are the main targets of the activity. Delays will result in losses, for example additional costs. Time management includes planning, compiling, and controlling the schedule.	0	0	19	31	181	3,620	0,905	Very Influential
3	Cost management includes all aspects related to funds and project activities. In order for management to be effective, various methods and techniques are prepared such as compiling a cost budget, the concept of yield value, and so on.	0	0	26	24	174	3,480	0,870	Influential
4	In order for the project activity to meet the planned requirements, a long process is needed starting from reviewing the implementation	0	5	20	25	170	3,400	0,850	Influential

requirements, describing the requirements into specifications, and pouring them into working drawings.

c. Ranking Order of Scores Using Non-Parametric Statistical Scores.

Based on the ranking order of scores using non-parametric statistics, factors that are very influential to not influential are taken, including:

1) Factors that are very influential in construction management that must be considered in the construction of commercial buildings are as follows:

Table 5. Score Order of Factors That Are Very Influential in Construction Management That Must Be Considered in the Construction of Commercial Buildings

No	Highly Influential Factors in Construction Management That Must Be Considered in Commercial Building Construction	*x*	Information
1	Equipment costs for all types of equipment used in the project include: operating costs, depreciation costs, maintenance costs, and repairs.	3,600	Very Influential
2	Obtaining all necessary information both in the contract documents and obtained outside the contract documents, namely: Field location and its surroundings, both natural conditions and socio-cultural conditions of the local community. Resources available at the location and its surroundings.	3,500	Very Influential
3	Required preparatory work, for example: work roads, work facilities, offices, base camps and others.	3,700	Very Influential
4	Determining the type, composition and number of tools/labor to be used according to the existing or given time limit.	3,620	Very Influential
5	Material costs for all types of materials required by the project.	3,560	Very Influential

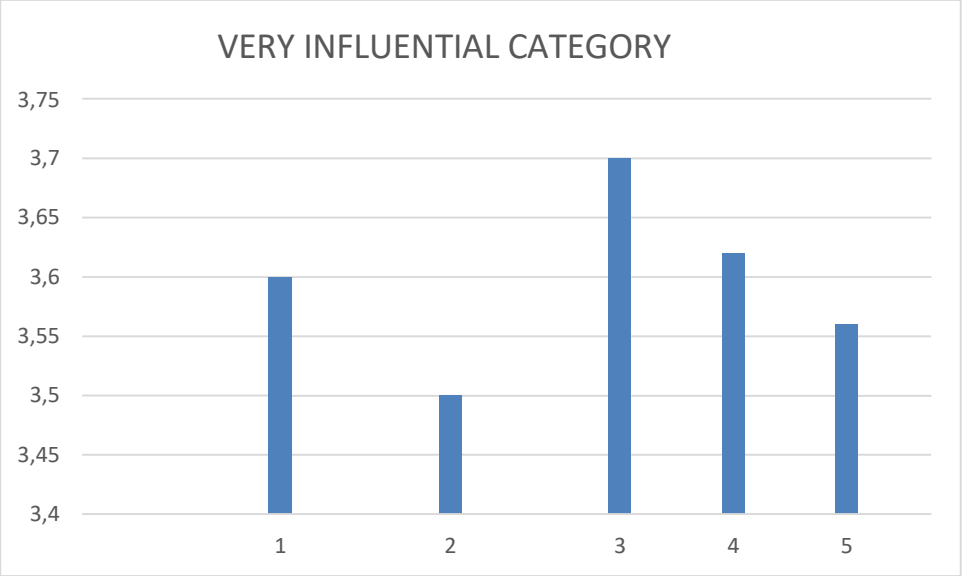


Figure 1. Bar Chart Has a Great Influence on Construction Management That Must Be Considered in the Construction of Commercial Buildings.

2) Factors included in the category of influencing Construction Management that Must be Considered in the Construction of Commercial Buildings are as follows:

Table 6. Score Order of Factors that Influence Construction Management that Must be Considered in the Construction of Commercial Buildings

No	Factors Influencing Construction Management That Must Be Considered in Commercial Building Development	*X*	Information
1	The method chosen to carry out each part of the work, for example: excavation, dewatering, form work system, casting system and others.	3,480	Influential
2	The sequence of work execution, usually seen in the work time schedule.	3,200	Influential
3	Changes in situations and conditions (changes in building location).	3,400	Influential
4	Wage costs for all types of existing work.	3,400	Influential

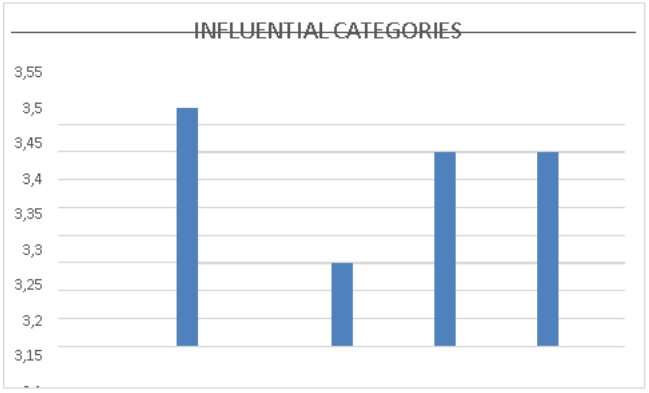
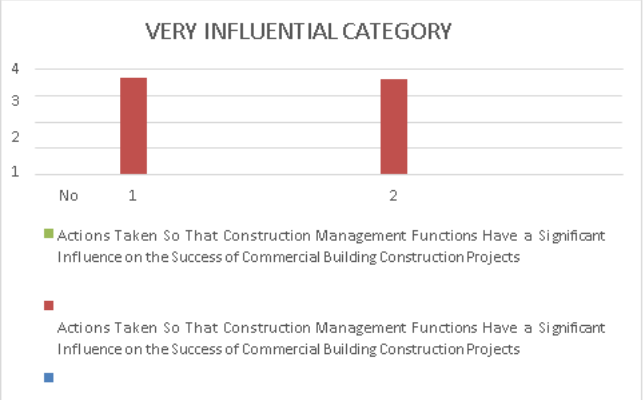


Figure 2. Bar Chart Affecting Construction Management That Must Be Considered in Commercial Building Construction.

3) Factors that are included in the category of very influential at the stage of actions taken so that the Construction Management Function has a Significant Influence on the Success of Commercial Building Construction Projects are as follows:

Table 7. Sequence of Scores for Actions Taken So That Construction Management Functions Have a Significant Influence on the Success of Commercial Building Construction Projects

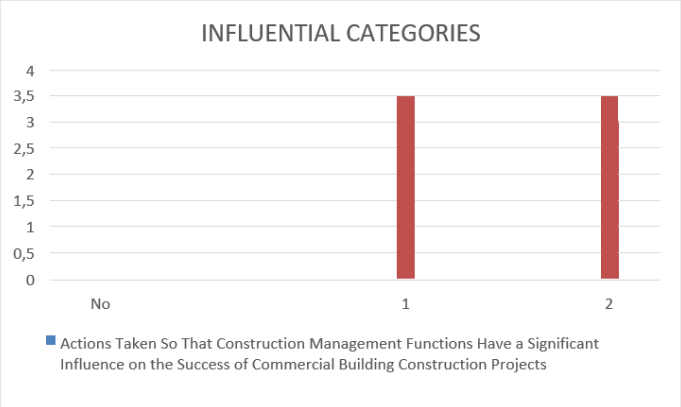
No	Actions Taken So That Construction Management Functions Have a Significant Influence on the Success of Commercial Building Construction Projects	*x*	Information
1	Within the scope of the project, limitations containing quantity, quality, and specifications are things that need to be considered so that in its implementation it does not cause incorrect implementation between interested parties, namely between the owner and the service provider.	3,660	Very Influential
2	In project implementation, time and schedule are the main targets of the activity. Delays will result in losses - such as additional costs. Time management includes planning, compiling, and controlling schedules.	3,620	Very Influential



4) Factors included in the category of influencing the stage of actions taken so that the construction management function has a significant influence on the success of commercial building construction projects are as follows:

Table 8. Order of scores for actions taken so that the construction management function has a significant influence on the success of commercial building construction projects

No	Actions Taken So That Construction Management Functions Have a Significant Influence on the Success of Commercial Building Construction Projects	*X*	Description
1	Cost management includes all aspects related to funds and project activities. In order for management to be effective, various methods and techniques are prepared such as preparing a cost budget, the concept of yield value, and so on.	3,480	Influential
2	In order for the project activities to meet the planned requirements, a long process is needed starting from reviewing the implementation requirements, describing the requirements into specifications, and pouring them into working drawings.	3,400	Influential



Analysis of Construction Management Functions in Commercial Building Construction Projects in Medan City.

Judging from each stage in the implementation of building construction and analysis of each factor that influences each stage. Then the sequence of stages that greatly influence the construction management factors that must be considered in the construction of commercial buildings and the actions taken so that the construction management function has a significant effect on the success of the building construction project are as follows:

1. Stage of construction management factors that must be considered in the construction of commercial buildings with an average value (mean) of 3,600
2. Stage of actions taken so that the construction management function has a significant effect on the success of the building construction project with an average value (mean) of 3,660

Table 10. Calculation Data for Stages of Construction Management Factors that Must be Considered in the Construction of Commercial Buildings and Actions Taken So That the Construction Management Function Has a Significant Influence on the Success of Building Construction Projects

No	Construction Management Factors That Must Be Considered in Commercial Building Construction and Actions Taken So That Construction Management Functions Have a Significant Influence on the Success of Building Construction Projects.	*x*	Description

1	The cost of equipment for all types of equipment used in the project includes: operating costs, depreciation costs, maintenance costs, and repairs.	3,600	Very Influential
2	Within the scope of the project, limitations containing quantity, quality, and specifications are things that need to be considered so that in its implementation it does not cause incorrect implementation between the interested parties, namely between the owner and the service provider.	3,660	Very Influential

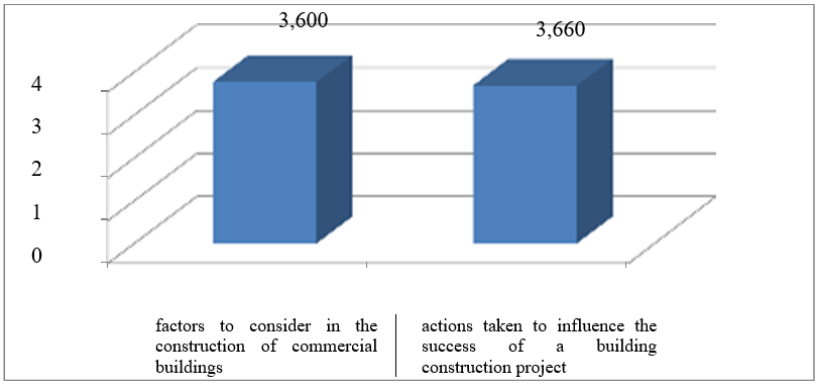


Figure 5. Bar Chart of Construction Management Factors That Must Be Considered in Commercial Building Construction and Actions Taken So That Construction Management Functions Have a Significant Influence on the Success of Building Construction Projects

From the diagram above, it can be seen that the factors that must be considered in the construction of commercial buildings and the actions taken to influence the success of the building construction project have a high average (mean) value, therefore all factors and actions must always be applied in building construction projects.

CONCLUSION

This final project research was conducted by distributing questionnaires to 50 respondents who were contractors or construction service entrepreneurs in Medan City. The purpose of the study was to identify construction management factors that need to be considered in the construction of commercial buildings, as well as actions that can improve the effectiveness of the construction management function in project success.

Based on the results of the questionnaire analysis, there are several factors that are very influential, including: the cost of using project equipment (operational, maintenance, depreciation), field information and social conditions of the community around the project, preparatory work (such as work facilities and basecamps), determination of tools, and project material costs. Meanwhile, influential factors include the order of work implementation, work methods, allocation of tools and labor, and adjustments to changes in the situation in the field.

For managerial actions, highly influential actions include setting project boundaries (quantity, quality, and specifications) to avoid miscommunication, as well as comprehensive time management to avoid delays and cost overruns. Influential actions include systematic project cost management and translating project requirements into clear technical specifications and working drawings.

Based on the research results, factors that greatly influence the construction management function for the success of commercial building construction projects are produced, so that contractors are expected to be able to identify early on the construction management factors that must be considered in the construction of commercial buildings in the city of Medan. This identification aims to achieve the success of commercial building construction projects, so that construction project actors can respond more quickly to what needs to be done in applying the construction management function.

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