A NOVELTY FACTORS OF DELIVERY ROAD STREETS IN MEDAN CITY BASED ON PERCEPTION STAKE HOLDER

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Abstract: *Development of road infrastructure in Medan city today has been a concern and the priority of the government to support the acceleration of the economy in the Medan city. However, the problems that occurred in the project implementation is incomplete highway projects in a timely, cost and quality that has been set. The purpose of this study was to determine the weighting of the factors that cause delays in the completion of a highway project according to the perception of stakeholder and a model of the backlog at the end of a highway project in Medan city. Data analysis technique using Microsoft Excel to obtain a weighting of the delay factors of each respondent, employing Factor Analysis method to get the model of delay factors. From the results of analysis show that the primary factor causing the delay of highway project in Medan city according to respondents of contractor is a delay provision of massive equipment factor with a percentage of 4.64%, then according to respondents of consultant is design error factor with a rate of 4.81%, and then according to respondents of public Works Service is scarcity of material required with a percentage of 4.53%. The result gained models of delays interpreted that project management factors (F1) provide the most impact on delay in the completion of a highway project in Medan city that is equal to 13.187%.*

Key Words: *Factor Analysis; Factors of Delay; Factor Analysis Method.*

1. INTRODUCTION:

Development of road infrastructure in Medan city has the concern and the priority of the government to support the acceleration of the economy in the Medan city. However, the problems that happen in the project quality that has been set. The purpose of this study is to determine the weight of the highway project according to the endorsement of a highway project in Medan city. Data analysis technique using Microsoft Excel to obtain a weighting of the delay factors of each respondent, employing Factor Analysis method to get the model of delay factors. From the results of the analysis of the elements in Medan city according to respondents of contractor is a delay provision of massive equipment factor with a percentage of 4.64%, then according to respondents of consultant is design error factor with a rate of 4.81%, and then according to the respondents of the Public Works Agency is the scarcity of material required with a percentage of 4.53%. The result of project management factors (F1) provides the most impact on the completion of a highway project in Medan city that is equal to 13.187%.

2. ROAD CONSTRUCTION PROJECT:

The notion of a construction project according to Soeharto (1998), quoted in Leuhery (2014), is a series of activities that are only one time implemented and generally short term. Road construction projects are included in civil engineering construction projects or heavy engineering construction projects. The implementation of road construction work in the field is carried out by the implementing contractor who has been appointed as the winner of the project tender, and supervised by the supervisory consultant and the Public Works Department. Implementation of road construction should be based on the working drawings, technical specifications and work plans and terms (RKS) listed in the contract documents, and following the instructions and instructions of the supervisory consultant. The stages of road construction as follows:

a. Preparatory work

Preparatory work includes, pegging and re-measurement work, structural feasibility survey of pavement construction, procurement of board directors and preparation of road bodies.

b. Land work

Land work in this case is excavation work and heaps

Bottom layer work (Subbase course)

The bottom layer is below the top foundation layer, and above the base soil layer. This layer serves to spread the burden of the foundation layer below the base soil coating.

c. Top layer work (Base course)

The upper layer of the foundation lies beneath the surface layer. The material used for this layer is to be of high quality material so that it is strong to withstand the load for the planned.

d. Surface course work

This surface layer is located at the top of the highway. This layer is in direct contact with the vehicle tire and serves as a vehicle wheel holder.

e. Finishing work

The finishing work involves the work of compaction and highway alignment using heavy equipment.

f. Construction Project Management

The success rate or failure of a project is determined by the parties, directly and indirectly, related to a stage of construction project management. According to Harahap, 2012, the steps of construction projects are as follows:

g. Planning Stage

All construction projects usually begin with ideas or plans and build on demand. The party involved is the owner.

h. Feasibility Study Stage

At this stage, it is to convince the project owner that the proposed construction project is feasible to implement. The party involved is a consultant of a feasibility study or construction management consultant.

i. Stage of Explanation (Briefing)

At this stage the project owner explains the function of the project and the allowable costs so that the planner consultant can correctly interpret the wishes of the planner. The party involved is the owner and consultant planner.

j. Stage Design (Design)

At this stage is to design (design) more detailed by the wishes of the owner, such as drawing plans, specifications, cost budget plan (RAB), implementation methods, and so forth. Parties involved planner consultants, MK consultants, value engineering consultants, and or quantity surveyor consultants.

k. Procurement / tender stage

This stage aims to get the contractor who will work on the construction project, or even look for subcontractors. The parties involved are the owner, the executor of the construction service (contractor) and the consultant of the Constitutional Court.

l. Implementation Phase (Construction)

The objective at this stage is to realize the building required by the project owner who has been designed by the planning consultant within the cost limitations, agreed a time and required quality. The parties involved at this stage are the supervisory consultants and or consultants of the Constitutional Court, contractors, subcontractors, suppliers and related agencies.

m. Maintenance & Start-Up Stage

The objective at this stage is to ensure that the completed building is by the contract documents and all facilities are working properly. The parties involved are supervisory consultants / MK, users, and owners.

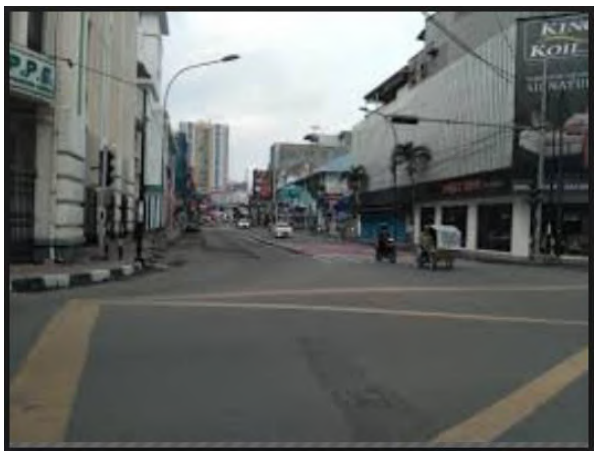


Figure1. Road of Medan City near to Stake holder

3. RESEARCH METHODS.

The research was conducted at Public Works Department of Bina Marga of North Sumatera Province, Public Works Department of Medan Bina Marga, 94 contractor companies, and 36 consulting companies domiciled in Medan city area and experienced in the road project in Medan. Primary data in this study were obtained from the results of questionnaires and interviews conducted by the respondents, while the secondary data in this study were obtained from the literature on the factor of the delay of the highway

project, the data of contractor company's population obtained from the office of the Indonesian National Construction Contractor Association (GAPENSI) Of North Sumatera Province, population data of consultant companies derived from the position of the Indonesian Consultant Association (INKINDO) Medan City, and employment population data of Public Works Department of Bina Marga North Sumatera and Medan. Data collection techniques by distributing questionnaires and direct interviews to the responder.

The method of data analysis in this research is as follows:
Determining the number of research samples using Slovin Formulas
Determine the scale of the questionnaire statement

4. RESULTS ANALYSIS.

a. Analisis *Mean*

Mean analysis aims to determine the weight/percentage of each factor causing the delay of completion of road construction project and also from the weight/percentage is known factor causing a delay of completion of the most dominant road project in Medan City according to each perception from the stakeholder. The results of the analysis, it is known that the primary factor causing the delay in the completion of road projects according to the contractor's respondents is the 8th factor (X8) that is the delay of massive equipment provision with the weight of 4.69, while based on the analysis of the mean elements that become the leading cause of the delay the road project in Medan city according to the consultant's respondents is the 23rd factor (X23) that is the design error with the weight of 4.81, and the result of the mean analysis of the respondent of the Public Works Department indicates the factors that become the leading cause of the delay of the road project in Medan city is the factor to 13 (X13) namely the required material scarcity with a weight of 4.53.

The feasibility of a factor analysis is determined by the Kaiser Meyer-Olkin (KMO) Measure of Sampling Adequacy (MSA) and Bartlett's Test of Sphericity test. The correlation test results between the variables in KMO and Bartlett's Test using can be seen in Table 1 below.

Tables 1. Value analysis KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		,841
Bartlett's Test of Sphericity	Approx. Chi-Square	3418,179
	Df	820
	Sig.	,000

Based on Table 1 above an obtained value of Kaiser Meyer-Olkin Measure of Sampling Adequacy of 0.841 with a significant amount of 0,000 which means the cost of a sig. <0,05 and KMO-MSA value> 0,5; so the factor analysis performed shows the variables are feasible to factor and the factors can be analyzed further.

b. Analysis *Anti Image Correlation*

The next analysis after the KMO test is Anti Image CorrelationTest; the following Table 2 will show the analysis results of Anti Image Correlation (the value marked with a) for factor 1 to factor 10.

Tables 2. Values of Anti Image Correlation

		X1	X2	X3	X4	X5	X6	X7	X8	X9	X10
Anti-image Correlation	X1	.761[a]	-,514	,012	,095	-,045	-,325	-,081	-,235	,172	-,127
	X2	-,514	.773[a]	-,127	-,113	-,044	,047	,138	-,048	-,219	,177
	X3	,012	-,127	.895[a]	-,290	,023	-,314	,054	,014	-,033	-,084
	X4	,095	-,113	-,290	.863[a]	-,335	-,095	-,038	-,256	,159	,060
	X5	-,045	-,044	,023	-,335	.835[a]	-,192	-,193	-,031	-,152	,046
	X6	-,325	,047	-,314	-,095	-,192	.844[a]	-,135	,195	,092	-,019
	X7	-,081	,138	,054	-,038	-,193	-,135	.913[a]	,053	-,137	-,145
	X8	-,235	-,048	,014	-,256	-,031	,195	,053	.876[a]	-,019	-,208
	X9	,172	-,219	-,033	,159	-,152	,092	-,137	-,019	.815[a]	-,094
	X10	-,127	,177	-,084	,060	,046	-,019	-,145	-,208	-,094	.924[a]

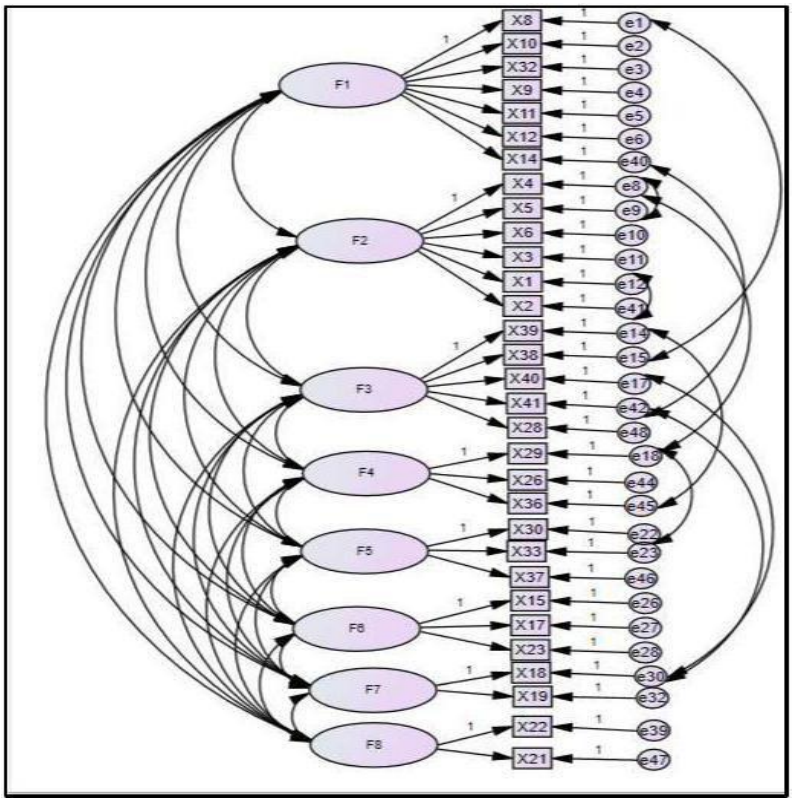
Tables 3. Value of Rotation Component Matrix

	Component							
	1	2	3	4	5	6	7	8
X8	**,733**	,300	,134	-,081	-,122	,086	,106	,328
X10	**,692**	,345	,152	,205	,185	,243	,072	-,149
X32	**,681**	,239	,170	,168	,271	-,017	-,180	,191
X9	**,672**	-,038	,113	-,016	,175	,147	,127	-,029
X11	**,654**	,337	-,030	,162	,164	,308	,062	-,103
X12	**,595**	,382	-,146	,222	,048	,256	,019	-,184
X14	**,574**	,290	-,085	,046	,230	,378	,143	-,090
X4	,142	**,752**	,097	,055	,171	,168	,117	,168
X5	,210	**,751**	,169	-,074	,107	,087	-,213	,116
X6	,150	**,712**	,018	,179	,191	,215	,202	-,190
X3	,101	**,694**	-,011	,066	,316	,217	,259	-,154
X1	,261	**,684**	,290	,191	-,049	-,216	-,067	-,008
X2	,368	**,573**	,120	,125	-,083	-,052	,356	,083
X39	-,015	,146	**,880**	,059	,169	,164	-,001	-,071
X38	,076	,092	**,832**	,249	-,016	,159	,081	,175
X40	,100	,122	**,830**	,232	,115	,295	-,174	,005
X41	,076	,103	**,807**	,218	,083	,000	,216	,116
X28	,399	-,025	**,512**	,357	,046	-,180	,404	,061
X29	,165	,073	,320	**,797**	,081	,179	,198	,001
X27	,029	,035	,343	**,777**	,009	,096	-,104	,225
X26	,015	,181	,268	**,770**	,166	,094	,193	-,058
X36	,312	,164	-,039	**,600**	,237	-,116	,265	,279
X30	,193	,164	,112	,043	**,821**	,004	,062	,016
X33	,082	,284	,094	,131	**,734**	,155	,076	-,025
X37	,335	,008	,130	,261	**,547**	,243	,227	,218
X15	,378	,219	,300	,103	,054	**,668**	,060	,039
X17	,241	,154	,271	,111	,051	**,662**	,180	,141
X23	,313	,044	,180	,067	,346	**,605**	,056	,134
X18	,112	,135	,066	,059	,220	,053	**,828**	,093
X19	,032	,103	,063	,307	,008	,290	**,654**	,156
X21	-,137	,056	,071	,118	-,053	,054	,179	**,805**
X22	,289	-,140	,137	,176	,400	,250	,027	**,652**

c. Test of Conformity Measurement Model (Goodness of Fit)

The test results of suitability of measurement model can be seen in Table 4 below.

Based on Table 4, evaluation of the model criteria obtained 4 bad sizes, 4 marginal or considerable sizes, and 4 good sizes, so the overall suitability of the model is good.



Figures 2. Relationship Model Between Latent Variables and Manifest Variable

Tables 8.Value Goodness of Fit (GOF)

Ukuran GOF	Nilai Krisis	Hasil Estimasi	Tingkat Kesesuaian
Chi-Square	Nilai yang kecil	712,514	Buruk
P	P> 0,05	P = 0,000	
RMSEA	RMSEA = 0,08	0,084	Marginal
PNFI	0 – 1	0,614	Baik
PCFI	0 – 1	0,724	Baik
TLI	TLI = 0,90	0,821	Marginal
NFI	NFI = 0,90	0,719	Buruk
CFI	CFI = 0,90	0,848	Marginal
IFI	IFI = 0,90	0,852	Marginal
GFI	GFI = 0,90	0,733	Buruk
AGFI	AGFI = 0,90	0,666	Buruk
AIC	Nilai yang kecil dan dekat dengan AIC *saturated*	M* = 910,514 S* = 992,000 I* = 2596,316	Baik
ECVI	Nilai yang kecil dan dekat dengan ECVI *saturated*	M* = 8,130 S* = 8,857 I* = 23,181	Baik

5. CONCLUSION:

Based on the results of the research in the form of distributing questionnaires and interviews which are then processed and analyzed, it can be concluded several things as follows: Based on the analysis conducted using Microsoft Excel program for each respondent level of factors causing delays in completion of highway project in Medan, then obtained the weight or percentage of the elements causing the suspension according to the respondent of the contractor with the most significant influence is owned by the delay factor of heavy equipment that is equal to 4.69%, according to the respondent of the element causing factor of delay of highway project in Medan city caused by design error factor with weight / percentage of 4.81%, and according to the Dept. of Public Works the element causing the delay of road project in Medan city is the required material scarcity factor with weight of 4.53%. Based on the percentage of weight of the calculation results using Microsoft Excel program, it can be known the dominant factors or the main actors that cause the delay of completion of highway project in Medan city, taken by the top element with the most significant weight of each category of respondents that is delay factor supply of heavy equipment with load of 4.69%, material scarcity required by weight of 4.53%, and design error factor with weight of 4.81%.

The highest correlation value is owned by X8 that is 0.733. From the equation above, it is known that the variable that becomes member of component of factor 1 is a variable having value> 0.5, so it can be interpreted that the variable of delay of massive equipment supply (X8) gives influence 0,733 to project management factor, (X32) provides an effect of 0.681 to the project management factor, the machine damage variant during project implementation (X9) gives the effect of 0.672 to the project management factor, variable of low quality of equipment (X11) give influence 0,654 to project management factor, equipment deficiency variable (X12) give influence 0,595 to project management factor, variable of material delivery delivery to expect location (X14) give effect 0,574 to management factor project, which can be interpreted that the higher the value of X8, X10, X32, X9, X11, X12, X14 then the higher the project delay caused by factor 1 (F1), i.e. project management or vice versa.

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