

The Process Modeling for Feasibility study of Mixed-use Development by IDEF0

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ABSTRACT: The construction industry, as a industry of many influence in national business cycle, is changing into multiplicity, distinction and sophisticated system. It is demanded that construction instruction industry is changed to an aggressive and active development type from an order dependence type through the real estate policy on August 31 2005 and real estimate speculation regulation policy etc. The building construction has a process from planning to maintenance by designers, builders and developers. Therefore owners are trying to gain expense effect for a process of the public building construction. The business and sales facility construction is consist of the passive order system in response to owner's requests. As a result, it has incurred a great loss in development due to instinctive decision and a limited sense in economic side. This study is aimed at a process modelling to decide whether it is development of building through a process model included location, market analysis and feasibility study in the planning phase.

KEYWORDS: IDEF0 method, Feasibility study, MXD (Mixed-use Development), Location analysis, Market analysis, Sustainability

1. Introduction

1.1 Background and purpose of this study

A construction flow is moving building of singular use to complex use of building. In the case of apartment, villa, independent dwelling, Mixed-Use Residential and Commercial Building and another one including culture, business, exhibit, office in the same space have been gradually increasing. Mixed-Use Residential and Commercial Building built at the beginning of 1990 when the before-mentioned flow

began has been causing a variety of problems such as decline in sales rate and loss of building's deterioration use. As the flow of society has been complex, customers' requirement reducing the time to enjoy culture and buy purchase has spread. And also the Sustainability of building has almost entirely been ignored under the pretext of economic efficiency. Because of the above, building's functions have not been performed properly. Likewise, there was definitely not an attempt to build the eco-friendly building.

So a large-scale MXD reach at the crisis of bankruptcy. Supplementation and development of the functions is necessary to activate function of MXD. However, it is impossible to re-construct because MXD has the feature that it is large-scale, located in the city and benefits from maintenance fee through rent. Therefore, in the case of MXD, development project is necessary such as maintenance, repair, partly enlargement and rebuilding of building.

On this study, we named this kind of project as development project, trying to figure out problems in the necessities and procedure of the project.

1.2 Scope of this study

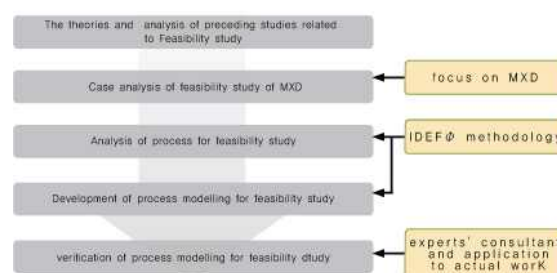
We set the limit to MXD. It is hard to exactly analyze feasibility of MXD which is prediction about the future of project development on the phase of planning. On this study, we consider various methods of making decision to be applied to feasibility analysis and factors. So, we suggest the process modelling for feasibility study advanced through for proper decision.

2. Contents and methodology of this study

With analysis of theories, preceding studies and similar cases related to feasibility study and analysis method. Developers suggest process model to help

owner make decision at the phase of planning.

As picture 1 shows, feasibility study is based on MXD after analysis of theories and preceding studies related to feasibility study. We draw the problems from process for feasibility study with IDEF0 and develop process modelling for feasibility study to improve it. We intend to construct process modelling for feasibility study through experts' consultant and the application to actual work.



<Picture 1 Process of study>

3. Process Modeling for Feasibility study

We set Analysis activities list to construct a systematic process modeling feasibility study of MXD. According to this, we grasp relation among ICOM(Inputs, Controls, Output, Mechanism) related to performance of analysis work and specify the process of analysis at low level as table 1. With this, we have the following pictures when we specify the information with IDEF0.

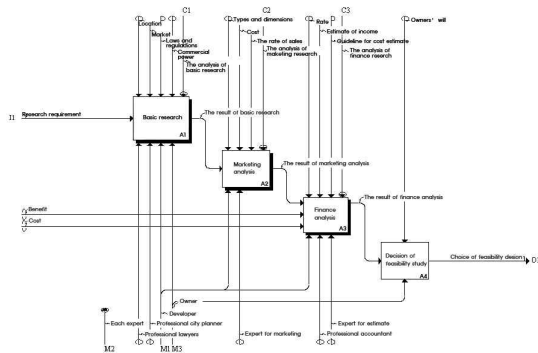
<Table 1 basic research of MXD ICOM Matrix>

Classification system	Activity	Input	Control	Output	Mechanism
A0	Feasibility study				
A1	Basic research	Research request	location	The result of basic research	Developers
			market		final deciders
			laws and regulations		professional lawyers
			commercial power		professional city planners
A11	Location analysis	Research request	Interior circumstance in real estate	The result of location analysis	developers
			Exterior circumstance		Final deciders
A12	Market analysis	The result of location analysis	Market demand	The result of market analysis	developers
			Market supply		
			Sale and purchase		
			Cost tendency in countries		
			Development present condition		
A13	Laws and regulations	The result of market analysis	Laws and regulations in formation related to estate	The result of laws and regulations analysis	developers
			Floor space index		professional lawyers

	analysis		The building-to-land ratio		
			Parking areas' dimensions		
			The distance left from street		
			population	The result of commercial power	developers
A14	Commercial power analysis	The result of Laws and regulations analysis	The volume of traffic	The result of basic research	Professional city planner
			income		
			Expenditures level		
			City planning		

As picture 2, Feasibility study is consist of basic researches, marketing analysis, financial analysis and decision of feasibility.

ICOM Matrix in table 4 is basic research part in picture 2.



<Picture 2 Process for feasibility study Level 2>

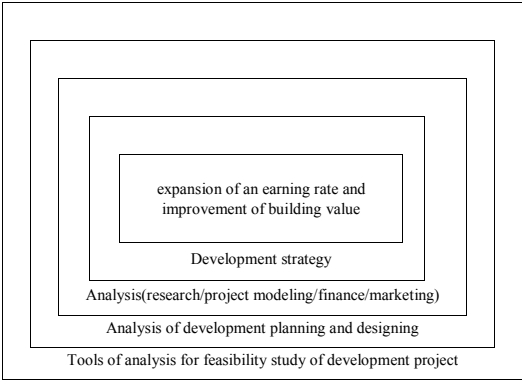
Feasibility study has lots of subjective intervention and owners' opinions from the early stage of project. Furthermore, it has limited participants and requires developer's ability. Location and market analysis are subjective and inaccurate. There is lack of various approach methods for feasibility study.

4. Construction and Verification of Feasibility study

4.1 Improved process model

As a part of developing process for feasibility study, we set the concept of feasibility study and improved outline for

feasibility study to specify analysis at each stage and maximize benefit as picture 3.

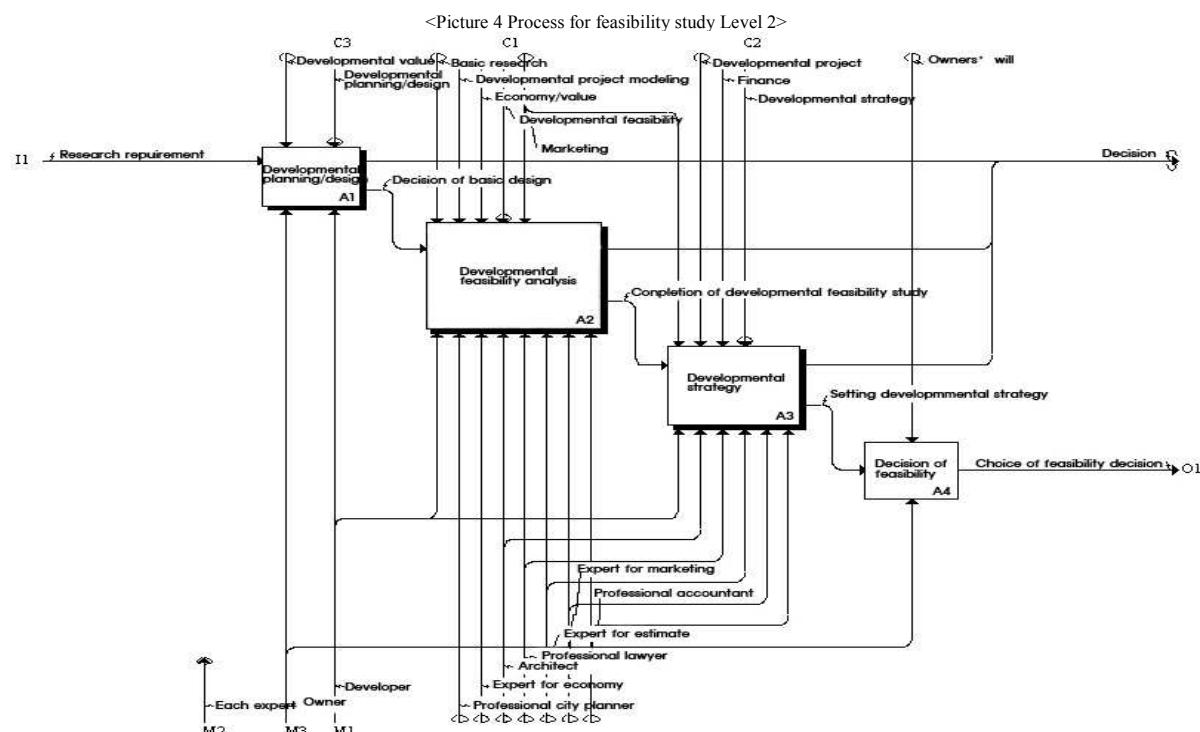


Picture 3 the outline for improving plan of feasibility study

To perform the feasibility study, we grasp owners' will for development. Besides, we create idea available in future and harmonized with society. And after setting developed project, model on developing project through analysis of basic information. We set developmental strategy based on economic aspect and feasibility study of marketing. Finally, we construct developmental process to draw decision on development from owners. In this case, we suggest the model for feasibility study of objective and reliable MXD to help owners make the right decision based on information analyzed at the stage of planning, feasibility study, strategy and decision. We get the ICOM Matrix in table 2 from experts' consultant and books. The process is as picture 4 according to IDEF0.

<Table 2 Planning/Designing and feasibility study on development of feasibility study>

Classification system	Activity	Input	Control	Output	Mechanism
A0	Feasibility study				
A1	Development planning/designing	Research request	Developmental value	Decision of basic plan	Owners
				Decision	Developers
A11	Analysis of developmental value	Research request	idea	Choice of idea	Owners
			Basic plan	Decision of basic plan	Developers
A12	Examination of development value	Choice of idea	Analysis of value in the future	Decision	Owners
		Decision of basic plan			Developers
A111	Creation of idea	Research request	Grasping owners’ will for development	Drawing idea	Owners
			Drawing developmental project’ concept with value in the future	Choice of idea	Developers
			Setting main use of developmental project	Analysis of idea	
A112	Setting basic plan	Idea analysis	Setting the basic scope of developmental project	Decision	Developers
		Choice of idea	Analysis of economical efficiency at the early stage of development	Choice of idea	
			Analysis of value in the future		
			Analysis of harmony with conditions around circumstances		
			Developmental process manual		
			Developmental method manual		
A2	Development Feasibility study	Decision of basic plan	Basic research	Completion of developmental feasibility study	Developers
			Developmental project modeling	Decision	Professional lawyers
					Professional accountants
					Professional city planners
					Professional economists
			Specialist for Estimate		
			Specialist for marketing		
A21	basic research analysis	Decision of basic plan	Project location	Completion of basic research	developers
			Laws and regulation	decision	Architects
			Developmental possibility		Professional city planners
			Market tendency		Professional lawyers
			Similar cases		Professional economists
A211	Project location analysis	Decision of basic plan	Conditions of Project location	The result of project location	developers
			Location condition		Professional city planners
			Condition of population, housing, commercial power etc.		
			Condition of circumstance		
			Traffic condition		
			Geographical condition		
			Present condition of facilities		
			Present condition around project location		
Developmental plan for the future					



5. Conclusion

We have suggested the process modeling for feasibility study as the definition of feasibility study, each participant's output from their activities. On this study, we improved existing feasibility study process through theories, the consideration on materials and analysis of cases. We set the goal about location and market analysis at the phase of planning in MXD and make the objective ability for feasibility study possible. Through improved process modeling for feasibility study, it is anticipated to be able to analyze more exact feasibility study with less participants and time. Furthermore, it will be possible to consider the friendly building in terms of the economic efficiency because the sustainable building is the best way to save the cost of maintenance ultimately.

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