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Architecture Strategy of High Speed Railway Indonesia China

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Abstract
High Speed Railway Indonesia China (Kereta Cepat Indonesia China/KCIC) is one of the promising solutions to overcome congestion of Jakarta - Bandung. Based on economic view, Jakarta Bandung corridor has a great potential in the development of industry, trade, and tourism. Development of Jakarta-Bandung High Speed Railway project used business to business scheme that means it does not use government-guaranteed loan or state budget. This study aimed to analyze the internal and external factors. The analysis will be forwarded to formulate an alternative and architecture strategies. The main strength of this project is labor absorption, but KCIC has a major weakness in Agrarian conflict (land acquisition). The main opportunities of this project is knowledge transfer that useful for the Indonesian consortium. However, the main threat of this project is a slow licensing procedur. Some of strategies that can be applied are research and development, implementation of development properly and promptly, government guarantees, manpower training, building a good relationship between the consortium, the construction of transit oriented development. These strategies are implemented based on some recommendations program that arranged using the architecture strategy.
Keywords: business to business, KCIC, solution, strategy

1. Introduction

The increase in number of motor vehicles in a year has reached 17 percent while the construction and widening of roads only 3 percent per year (Kemenkeu 2015). The need for efficient public transport that aslo fast, convenient, and cost is a very urgent to be met. Alternative of the railway development as a public transport to remove congestion in urban areas is right solution. Rail-based transport modes are also expected to be a solution to overcome the congestion, especially in big cities such as Jakarta and Bandung.

In addition to reduce congestion in Jakarta Bandung, there are also several benefits can be found. Based on economic view, Jakarta Bandung corridor has a great potential in the development of industry, trade, and tourism. It becomes a visitor attraction and economic improvement of Jakarta Bandung corridor. Thus, to realize a good public transportation in Jakarta Bandung corridor, Indonesian government builds a big project called Jakarta-Bandung High Speed Railway.

High speed railway Indonesia China (KCIC) is the owner of Jakarta-Bandung High Speed Railway project, this project using business to business scheme that means it does not use any state budget wether The Indonesian Budget, capital state or government-guaranteed in budgeting. Business to business scheme is run without Republic of Indonesia government interference. This scheme give a responsibility to the consortium that mandated by the Ministry of SOEs. Implementation of High speed railway Indonesia China (KCIC) can not be separated from several aspects such us the strengths, weaknesses, opportunities, and threats that must be faced. It needs a further research to analyze the internal and external environment and furthermore to formulate the alternative strategies and architectural strategies in order to run KCIC projects smoothly and optimally.
Based on the background, this study has objectives as follow :

1. Analyze the external and internal factors of the company to analyze the strengths, weaknesses, opportunities and threats of High speed railway Indonesia China (KCIC)
2. Formulate an alternative strategy and architecture strategy of High speed railway Indonesia China (KCIC)

2. Research Methods

Data used of this study are primary and secondary data. The primary data obtained through observation, interviews with company management or professionals. Secondary data were obtained through previous studies, journals, books related study, and other relevant sources.

2.1. Stage of Input (IFE and EFE Matrix)

EFE matrix used to evaluate external factors related to opportunities and threats that considered important for the cooperative. IFE matrix used to determine the internal factors of cooperative related strengths and weaknesses that considered as important factors. Steps in formulating EFE and IFE matrix can be describe as follows:

1. Create the lists of critical success factors (determining factors that belong to the external components are opportunities and threats as well as internal components are strengths and weaknesses)

2. Determine the value (weight) of the critical success factors (higher scale for higher achievers. The weight of each variable was obtained by using the value of each variable of total value.
3. Determine the rate of each critical success factors (Determination of the rate by indicators of 1 to 4 with the lowest to highest scale effect to the company)
4. Score weights and rate
5. Sum whole scores then inserted in matching stage.

2.2. Matching Stage (IE dan SWOT Matrix)

IE Matrix (Internal-External) is a combination result of IFE and EFE matrix. IE matrix based on two key dimensions, the total IFE value that pointed to the X-axis and the total value EFE that pointed to Y-axis. Of the total value which was given a weight in each division further arranged to be matrix of IE on a corporate level. According to David (2011), quadrant of IE matrix is divided into three main areas. The first area consists of quadrants I, II, and IV are called grow and build. The second area consists of a quadrant III, V, and VII are called hold and maintain. The third area consists of a quadrant VI, VII, and IX are the harvested or divested situation. IE matrix results can be used as reference in selection strategies that formulated by SWOT analysis.
A qualitative approach of SWOT matrix displays eight boxes, two at the top are external factors (opportunities and challenges) while the two boxes in the left are the internal factors (strengths and weaknesses). Four other boxes are strategic issues that arise as the result of meeting point between internal factors and external. SWOT matrix can be seen in the Table 1.

Table 1. SWOT Matrix

External / Internal	Opportunity	Treaths
Strength	Comparative Advantage	Mobilization
Weakness	Divestment / Investment	Damage Control

2.3. Decision Stage (Architectural strategy)

Architectural strategy used to see the the strategy design in order to achieve the vision and mission of the company. The establishment is not depend by the rules. Architecture strategy is easier to understand because the strategy which will be run explained into an sketch. Architecture strategy of this study will be ilustrated using the X-axis as the range of periods and Y-axis as the range of activities. The sketch covers strategies, programs, goals, and challenges that will be traversed by the project high speed Railway Indonesia China. Range of project period will be matched to planning activities. Activities that precedence is activity that easy to be impelemented as job priority. In reaching the project goals some recommendation progam is needed to support the project implementation.

Framework

KCIC is a high speed train construction projects from Jakarta to Bandung by utilizing the concept of business to business. Businesses are built from a consortium of Indonesia and China have become a reference in the construction of the project. This study will discuss environment-related company that could affect the success of the project includes the external and internal environment. Environmental analysis will be forwarded to establish a business strategy in overcoming the existing problems and utilize the competitive advantage held by the company. The strategy should be consistent with the goals to be achieved by the company in the form of programs and goals of the company. It is analyzed using Architecture strategy to be something that is a priority so that it can become a solid foundation for the company to operate all aspects of its business activities. Framework of this study listed in Figure 1.

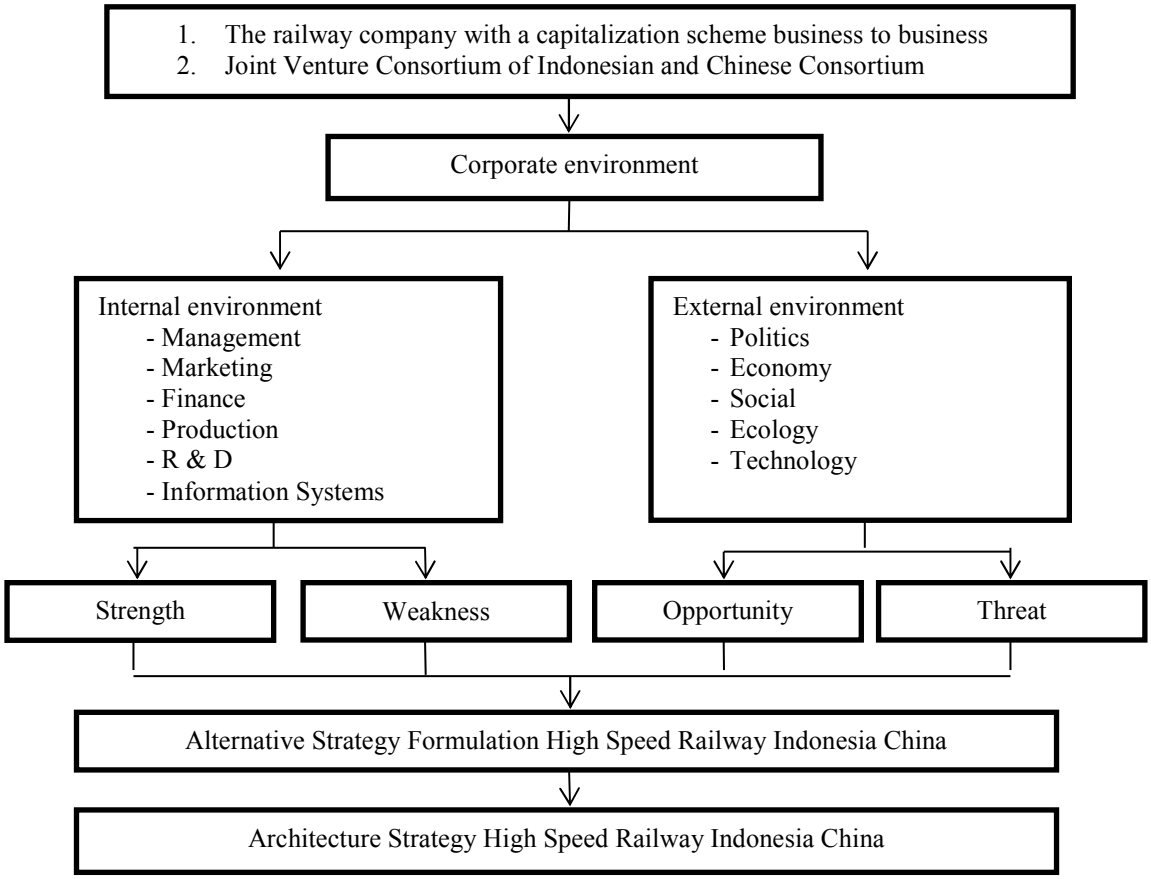


Figure 1. This research conceptual framework

3. KCIC Overview

The Republic of Indonesia Government improve the public transportation mode that is believed to be able to reduce congestion in Jakarta and other areas. High speed railway projects Jakarta - Bandung using business to business scheme or B to B where Indonesian government purely will not intervene in construction and project management process. Ministry of SOE has formed a consortium consisted of four (4) state-owned company that are PT Wijaya Karya (Persero) Tbk, PT Kereta Api Indonesia (Persero), PT Jasa Marga (Persero) Tbk, and PT Perkebunan Nusantara VIII (Persero), here after called the Indonesian Consortium. While the Chinese consortium consisted of China Railway International Co. Ltd, China Railway Engineering Corporation, China Railway Rolling Stock Corporation, Sinohydro Corporation and China Railway Signal and Communication Co.
High speed Railway project is known as the direct brainchild of President Joko Widodo has 150 km length connecting Jakarta to bandung starting from Gambir region and ended to Gedebage region. Location stations planned in the feasibility study are consisted of eight stations which are, Gambir, Manggarai, Halim, Cikarang, Karawang, Walini, Kopo, and Gedebage. The position of depot for maintenance and garage rail cars is located in Gedebage as the final location of railway.

Since established on October 16, 2015, High speed railway Indonesia China (KCIC) has appointed 3 Commissioner, 1 President Director, 1 Director of Transit Oriented Development, 1 the Director of Infrastructure Development, 1 the Director of Finance, and 1 Director of Human Resources. For a new company, developing organization is a priority to do, due to the company's organization will be a weapon for company to face the challenges when running business activities.

4. Result and Discussion

4.1. Vision and mission of company

Vision was created as view of what will be company achieved in the next 10 years and it will become the common goal of the entire company. Vision of High speed railway Indonesia China (KCIC) is:

"The high speed train be a first choice in transport corridors of Jakarta - Bandung"

The company's vision that has been agreed needs to be achieved so that High speed railway Indonesia China (KCIC) has launched the company's mission to support the successful achievement of vision. The mission are:

1. Be a reliable high speed railway operator

2. Provide high speed railway with an excellent service and high quality operations.
3. Create a new economic centers around the high speed railway station area.
4. Meet the expectations of main stakeholders.

4.2. Analysis of Company Environment

4.2.1. Internal environtment

Internal environment of high speed railway Indonesia China are used in project management. Project Implementation considering several internal components, as follows:

1. Agrarian Conflict

   Land acquisition is important to be implemented with the involvement of PT Jasa Marga (Persero) Tbk, PT Kereta Api Indonesia (Persero) and PT Perkebunan Nusantara VIII.

2. Compliance Human Resources

   Human resources used in the KCIC project implementation are insisted of human resources of Indonesia that will fill 70% and 30% of China human resources that are expert labor. However, KCIC will prioritize local labor during the construction and operation of KCIC. During 3 years construction period KCIC will absorb 39 000 people, TOD period for 15 years will absorb 20 000 people and the operational period of 25 years TOD will absorb 28 000 people.

3. Marketing and market demand

   According to demand forecast conducted by LAPI ITB, the number of passengers per day which can be transported by KCIC was 50 090 people (figure pessimistic) and 78 291 (optimistic figures). This will affect the traffic on the motorway and helps to solve the toll road problems per day. These impact will reduce the traffic density or even congestion in Jakarta Bandung toll road which pass through Jakarta - Cikampek and Purbaleunyi toll road.

4. Financing

   The partnership will be realized in a Joint Venture Company with inclusion Indonesian Consortium composition of 60% and China Consortium of 40%. Project financing consists of 25% equity and 75% loans. The loans porsion source come from China Development Bank. The loan is 63% USD with a fixed rate of 2% per year; 37% RMB with fixed rateof 3:46% per year; and a repayment period of 40 years including a grace period of 10 years. Chinese consortium also offer competitive rolling stock which is USD 33 million / sets (8 cars rolling stock). Financing of the project will be divided in to some parts of operating costs (personnel costs, fuel, maintenance), depreciation charges, financing costs and taxes.

4.2.2. External environment

The external environment is an environment outside project management that affect to decision making of the project. Some of external components at KCIC project are :

1. Political Risk

   Political risks that can happen is change of the regulation pursued by the central government in the next government period . It can disrupt the project continuity. KCIC require the guarantee of regulation consistency in projects development until it be complete. There are some licensies that must be completed to facilitate project KCIC. Licensing alignment stating topography and soil surface level determination KCIC project basis is appropriate. Licensing Enterprises, Concessions and Development is still on process. In addition, licensing.

2. Economy

   The global economic crisis also affects cutting budget of ministries and agencies as a defisit result. it includes the budget of development of transport sector in general and railways particularly. It indicates the dependence of railway development activities on abroad production stuffs/materials may affect the project budget.

3. Social and Ecology

   KCIC development will reduce the congestion level that occur in Jakarta - Bandung. KCIC has an impact on reducing the use of oil-based vehicle fuels and its pollution. But on the other hand, the project area is close to the source of earthquake zone that turned away the active faults on land and plate subduction zones in the Indian Ocean. It will add a new problem of KCIC to complete the documents, research, and EIA permit that stated project KCIC ensure work safety and passenger.

4. Technology

   Transfer of technology through training and cooperation of other investment entered the program knowledge transfer of high speed railway technology from China to Indonesia. the program covers internships and training for professional activities operation of high speed railway, locomotives, infrastructure, electrical and mechanical, rolling stock, energy supply (power supply), electrification and others. High Speed Railway Indonesia China (KCIC) ensure security level of high speed railway Jakarta-Bandung. It's due to the fast train control system adopts 3-CTCs that certified by Loyd's and TUV as well as certification of Safety

Implementation Level (SIL) 4. Technology installed also has an early warning system against disasters.

5. Competition inter modes
   Evaluating the condition of railway competition needs to look at some service products or other existing service, that are:
   a. The same shape (railway mode);
   b. The different shape, but has the same function (similar transport modes);
   c. The different shape and function but have the same goal (facilitating travel from origin to destination).

4.2.3. Matrix IFE, EFE, dan IE

IFE matrix used in determining score of the strengths and weaknesses of KCIC project. Overall, total score that obtained was 2,55 which shows that project KCIC has an internal position level of medium. Factors of internal strategies can be seen in Table 2.

Table 2. Factors of Internal Strategies KCIC

Factors of Internal Strategies	Weight	Rate	Score
Strenghts			
Skeme of business to business	0,13	2	0,25
Joint Venture Company	0,10	3	0,31
Labor absorbtion	**0,15**	**4**	**0,61**
Trust of stakeholders	0,10	2	0,21
Total			1,17
Weaknesses			
China conducted a feasibility within 3 months	0,08	1	0,08
High project cost	0,10	3	0,31
Agrarian Conflict	**0,16**	**4**	**0,64**
the less commitment of PT KAI	0,08	2	0,17
The low ability of personnel KCIC	0,09	2	0,18
Total			1,38
Total			**2,55**

EFE matrix used to determine the score of opportunities and threats of KCIC project. Overall, total score that obtained was 3:30 which shows that the project KCIC has a strong external position level. Factors of external strategies can be seen in Table 3.

Table 3. Factors of External Strategies KCIC

Factors of External Strategies	Value	Rate	Score
Opportunities			
Decrease of congestion level	0,08	2	0,17
Knowledge transfer	**0,13**	**4**	**0,53**
Strategic area of economic development	0,12	4	0,49
Total			1,19
Threats			
Changes of local regulations	0,11	4	0,42
The global financing crisis	0,07	1	0,07
Tracks hazard	0,08	2	0,16
Competition intermodes	0,08	3	0,23
Revenue and demand forecast do not match expectations	0,12	4	0,49
Licensing	**0,13**	**4**	**0,51**
Negatif opinion of public	0,08	3	0,23
Total			2,11
Total			**3,30**

Matrix IE (Internal-External) used in mathing of IFE and EFE matrix. High speed railway Indonesia China is in the position of Grow and Build. This position indicates that the project KCIC is on grow and build step. The strategy required is intensive or integrative strategies. Intensive strategies include market penetration, market development, and product development. Instead of, integrative strategy include backward integration, forward integration and horizontal integration. Overall, KCIC requires development strategy and cooperation with various parties to run KCIC project. These will be discussed in SWOT analysis. Matrix IE can be seen in Figure 2.

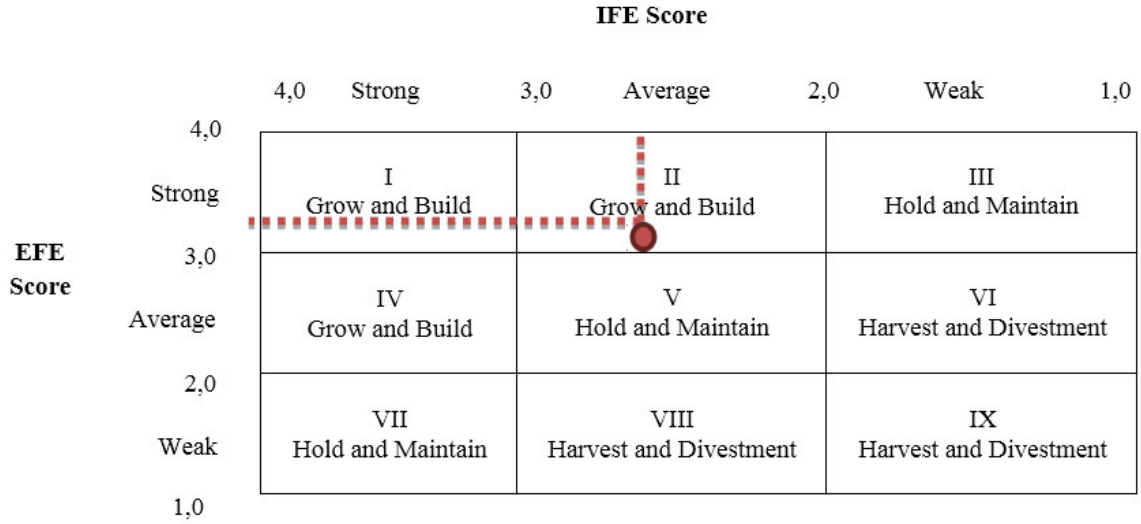


Figure 2. Matrix IE

SWOT Matrix

S-O Strategies (Strength-Opportunity)

1. Training of labor (S2, S3, O2). This strategy is established to create labor that good knowledge and good technology expert. The knowledge transfer that made by China consortium to Indonesia Consortium will helpful in project KCIC even in another project in spite of Chinese Consortium role.
2. Establishing the good relationship between consortium (S1, S4, O1, O3). Good cooperation with China consortium will facilitate the implementation of the project high speed railway Indonesian China. Business to business scheme that does not use government budget is right to be supported because government funds could be allocated to other activities.

S - T Strategies(*Strenght-Threat*)

1. The implementation of development properly and immediately (S2, S3, T2, T3, T4). This is intended to reduce threat such as financial crisis, disaster, and intermodal competition by considering the employment strength.
2. Government guarantees (S1, S4, T1, T5). The major threats like local regulations changes could be solved using a guarantee of government's for existing regulations during this project happening. This guarantee also applies to cope the revenue and demand forecasts that are not in line with expectations. Thus, the harmony between the government's program and the others is needed.

W-O Strategies (*Weakness-Opportunity*)

1. Developing Transit Oriented Development (W1, W2, W3, W4, W5, O1, O2, O3). One of high speed railway Indonesia China weakness is high costs, so that the some strategies is required in order to payback of the project can be done immediately with amaximum benefit. High costs of project require an innovative strategies to get a high income. The TOD will convince all stakeholders to involve in projects KCIC. However, it needs to be equipped by technology and knowledge transfer in order to minimize the disadvantage of project feasibility study and the licensing times needed.

W - T Strategies (*Weakness-Threats*)

1. Research, Development and Socialization (W1, W2, W3, W4, W5, T1, T2, T3, T4, T5, T6, T7). Research is highly important to accelarate the licensing, it is also required to overcome the lack of project feasibility study and hedging/ financial crisis. Research and development of project planning evaluation should be controlled to reduce the posible threats in the future. The existence of research will responsible the feasibility studies and trust of stakeholder to implementate the project high speed railway Indonesia China.

The SWOT Matrix strategy formulated by some alternative strategies can be seen in Figure 3.

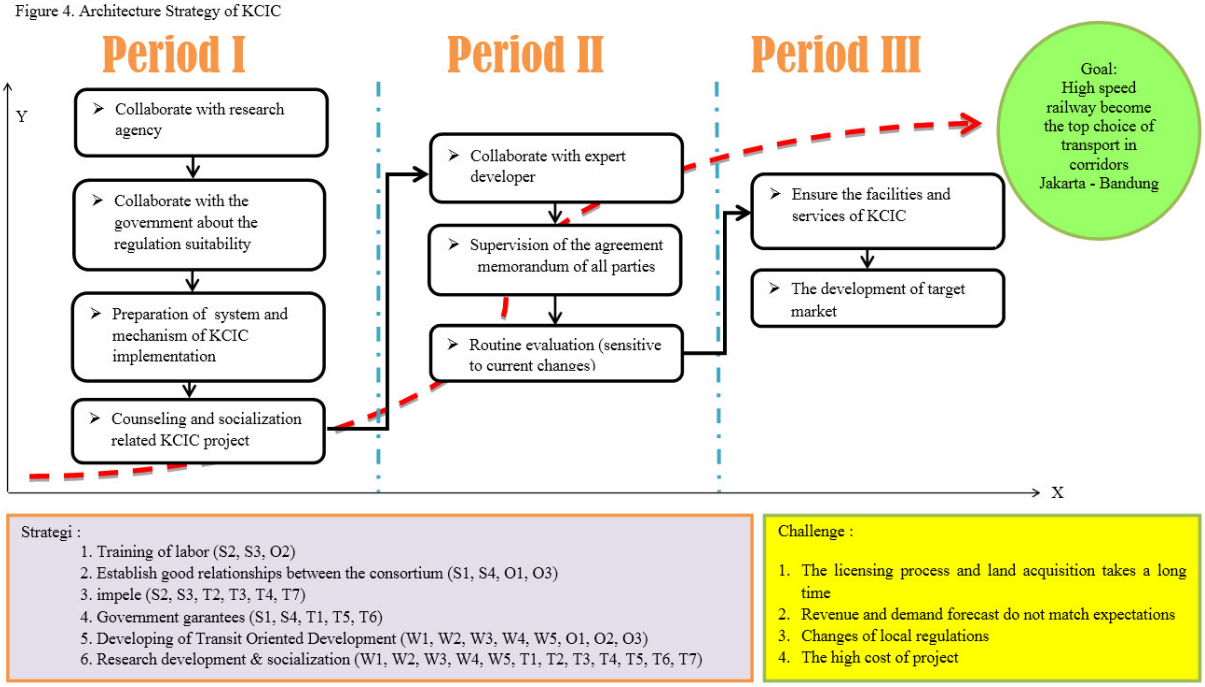
INTERNAL / EKSTERNAL	Strength	Weakness
	1. Scheme of business to business 2. Joint venture company 3. The absorption of labor 4. Trust of stakeholders	1. China conducted a feasibility within 3 months 2. High project Cost 3. Agrarian Conflict 4. The less Commitment of KAI 5. The weak personnel ability of KCIC
Opportunity 1. The decrease of congestion level 2. Knowledge transfer 3. strategic area of economic development	S-O Strategy 1. Labor training (S2, S3, O2) 2. Establishing the good relationships between consortium (S1, S4, O1, O3)	W-O Strategy 1. Developing Transit Oriented Development (W1, W2, W3, W4, W5, O1, O2, O3)
Threat 1. The changes of central and regional regulations 2. The global financial crisis. 3. Tracks hazard 4. Competition inter moda 5. Revenue and demand forecast do not match expectations 6. Licensing 7. Negative Opinion of Public	S-T Strategy 1. The implementation of development properly and immediately (S2, S3, T2, T3, T4, T7) 2. Government guarantees (S1, S4, T1, T5, T6)	W-T Strategy 1. Research and Development and socialization (W1, W2, W3, W4, W5, T1, T2, T3, T4, T5, T6, T7)

Figure 3. Matrix SWOT

4.2.4. Architecture Strategy

Architecte strategy design of project high speed railway Indonesia China is a mapping strategy that made to face the challenges in achieving business goals. The challenges faced by KCIC is licencing process that take a long time, revenue and demand forecast do not match expectations, the changes of local regulations and the high cost of project. To reach the goals accordance to the vision and mission launched by KCIC project, some program recommendation of each strategy will be designed. The architecture strategy of this study can be seen in Figure 4.

Figure 4. Architecture Strategy of KCIC



5. Conclusion and recommendations

Project high speed railway Indonesia China is one of the government's efforts to reduce the traffic density of Corridor Jakarta - Bandung. The main strength of this project is the high labor absorption. KCIC has major

weakness related to land acquisition issue. The main opportunities of this project is knowledge transfer that useful for the Indonesian consortium. However, the main threat is the licensing project that takes a long time as well as the incompatibility of revenue and demand forecasts at the implementation time.

Based on analysis IE, KCIC is on grow and build position as well as require intensive and integrative strategies. Some of the strategies that can be applied is research and development, implementation of development properly and promptly, government guarantees, manpower training, establishing a good relationship between the consortium, and the construction of transit oriented development. Those strategies implemented by some program recommendations using architecture strategy.

Overall, KCIC required to accelerate the licensing process and to work with various parties so that the project can immediately be executed. Implementation of the project requires some programs in evaluating the project to be sensitive to the changes. Instead of, two consortia are expected to act in accordance with the agreement which has been approved. The successful achivement of KCIC goals is inseparable from a facilities and services garantees, and the development of the target market to make KCIC as the primary choice thereby get the maximum profit.

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