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SWOT ANALYSIS IN STRATEGIC MANAGEMENT: A CASE STUDY AT PURABAYA BUS STATION

Hening Widi Oetomo
Lilis Ardini
Sekolah Tinggi Ilmu Ekonomi Indonesia (STIESIA) Surabaya
E-mail: oetomo_hening@stiesiaedu.com
Menur Pumpungan Street No. 30, Surabaya 60118, East Java, Indonesia

ABSTRACT

Gate automation (entrance automation) is a strategic plan that will be implemented at Purabaya Bus Station Surabaya. An automation technique with Radio Frequency Identification (RFID) is a method that can be used to store or receive data remotely using RFID tags or transponders. The purpose of this study was to determine the quadrant position in the SWOT diagram of the gate automation plan and determine the most appropriate strategy in accordance with the position of the quadrant on the SWOT diagram. Respondents who were used to measure strengths and weaknesses included fifty employees of the Purabaya Bus Station Surabaya, while to measure opportunities and threats were fifty drivers and automotive businessmen who currently use the bus station. Data were analyzed using SWOT in which the scores of internal factor (Internal Factor Analysis Summary-IFAS) and external factor (External Factor Analysis Summary-EFAS) were calculated. The results showed that score of internal factor and external factor were greater than 2. Hence, the position of SWOT for the gate automation was located in quadrant 1, suggesting that a company has strength to take an advantage of the existing opportunities.

Key words: *Gate automation, RFID, strategic planning, SWOT quadrant.*

ANALISIS SWOT DALAM MANAJEMEN STRATEGIS: STUDI KASUS PADA TERMINAL BUS PURABAYA

ABSTRAK

Otomatisasi gerbang (otomatisasi pintu masuk) adalah rencana strategis yang akan dilaksanakan di Terminal Bus Purabaya Surabaya. Teknik otomatisasi dengan Radio Frequency Identification (RFID) adalah metode yang dapat digunakan untuk menyimpan atau menerima data jarak jauh menggunakan RFID tag atau transponder. Tujuan dari penelitian ini adalah untuk mengetahui posisi kuadran pada diagram SWOT dari rencana otomatisasi gerbang di Terminal Bus Purabaya Surabaya dan menentukan strategi yang paling tepat sesuai dengan posisi kuadran pada diagram SWOT. Responden yang digunakan untuk mengukur kekuatan dan kelemahan adalah lima puluh karyawan Terminal Bus Purabaya Surabaya, sedangkan untuk mengukur peluang dan ancaman adalah lima puluh driver dan pengusaha otomotif yang saat ini menggunakan terminal bus tersebut. Data dianalisis menggunakan SWOT dengan menghitung faktor internal (Internal Factor Analysis Summary-IFAS) dan faktor eksternal (External Factor Analysis Summary-EFAS). Hasil penelitian menunjukkan bahwa skor faktor internal dan eksternal lebih besar dari 2. Karena itu, posisi SWOT untuk otomatisasi gerbang berada pada kuadran 1, menunjukkan bahwa perusahaan memiliki kekuatan untuk mengambil keuntungan dari peluang yang ada.

Kata Kunci: *Otomatisasi gerbang, RFID, perencanaan strategis, kuadran SWOT.*

INTRODUCTION

Along with the demanding needs of today society, the use of public transport like buses is not limited to the lower economic community, but also people of the middle and upper classes. In that condition, the variety of the public transport users demands a variety of services. For example, people from the middle and upper classes prefer the excellent service and facilities. They would feel satisfied when they can make a trip quickly, safely, and comfortably even though the fares to be paid are more expensive (Daley et al, 1988). Conversely, the lower economic groups prefer cheap public transport fares according to their financial ability despite the sub-standard facilities.

The quality of services, especially for passenger security and safety, can be improved by, among others, rethinking the problem of the vehicle construction. Good vehicle construction will reduce the possible occurrence of passenger accidents (Hill and Westbrook, 1997).

Very rapid technological developments have allowed us to make the best choice in helping us work to become more effective and efficient (Kurttila et al, 2000). This also applies to the development and combination of both applied mechatronic technology and information technology. The development and incorporation of both technologies has produced several new products which recently have been implemented widely, one of which is an electronic parking system (EPS). One of the technologies that is quite popular today is *Radio Frequency Identification* (RFID) (Weinstein, 2005).

A Radio Frequency Identification (RFID) system consists of several components, such as tag, tag reader, tag programming station, circulation reader, sorting equipment and inventory tag sticks. Security can be achieved in two ways. Security gates can query to determine the security status or its RFID tag contains security bit that can be either *on* or *off* when brought to the reader station (Maryono, 2005).

The use of RFID system is to transmit data from a portable device, which is called tag, and then read by the RFID reader and processed by computer application that needs it. These data which are already transmitted and sent may contain some information, such as ID, location information or other information such as price, color, purchase date and so forth. The use of RFID for tracking purposes was first done around 1980's. RFID quickly gained attention because of its ability to track a moving object. Along with the technological development, the RFID technology itself is also evolving so that the RFID can be used for everyday life (Reyes & Jaska, 2007).

In a simple RFID system, an object is equipped with a small and inexpensive tag. Tag consists of a transponder with a digital memory chip that contains a unique product code. Furthermore, the interrogator, an antenna with a transceiver and decoder, emits a signal activating the RFID tag so it can read and write data into it. When an RFID tag passes through the electromagnetic zone, it detects the activation signal emitted by the reader. Reader will decode the data existing on the tag and then these data will be processed by the computer (Juban & Wyld, 2004).

Purabaya/Bungurasih bus station as one of the largest land transport stations in the country geographically exists in Sidoarjo area. However, in the terms of administration and management, it belongs to Surabaya municipal government. The bus station is very feasible to use this new RFID technology to further enhance the performance of the station management particularly in the achievement of local revenues (PAD) so that it will become effective and efficient station in terms of its management.

The Purabaya Station continues reforming all fields, in addition to improved facilities and infrastructure. Purabaya Station currently will also implement ISO 9001: 2008 to improve the quality of service to all service users and public transport users. According to the Head of the Regional Technical Implementation Unit (*UPTD*) of the Pu-

rabaya Station, May Ronald, SE, MM, the Purabaya station will provide an excellent service to all service users. The excellent service includes quick service, service assurance, and hospitality of the station employees. This is especially done to make the public or users feel satisfied and comfortable using station services.

The Head of Technical Implementation Unit (UPTD) at Purabaya Station, Eddy said that on weekdays the numbers of passengers entering the Purabaya station are only about 26,000 people, but now rise to 30.000 passengers. These results in buses entering the station undergo fairly long queues and become overcrowded within the station.

Based on the problems that occur at Purabaya Station in terms of its service to the users, then the Surabaya City Department of Transportation will apply an *electrical gate control*, representing the electronic gate system at the station that is equipped with computer equipment and *id card* of the bus. Using this system, every bus entering the station can be identified properly of when they have entered the station, how log they have parked in the station and what the amount of charges is imposed on them.

The success of a technology in the application of the daily life is not only determined by the sophistication of the technology itself, but also supported by the strategy in its implementation. SWOT analysis is a technique widely used in selecting an appropriate strategy in associated with the internal capacity (*strengths* and *weaknesses*) of the company and the external situation (*opportunities* and *threats*).

Based on the description above, this study attempts to analyse the Gate Automation (Entrance Automation) Strategy at Purabaya Bus Station Surabaya. Several problems raised in the research are firstly where the quadrant position of the station gate automation implementation in the SWOT diagram; secondly, what is the most proper strategy implemented in associated with the position of the quadrant on the SWOT diagram. The purpose of the current study is to determine the quadrant position of the gate automation implementation on SWOT diagrams. Second, it is also designed to determine the best strategy to be implemented based on the quadrant position on SWOT diagram.

THEORETICAL FRAMEWORK

Definition of Automation Technique

A presence of the technology started from the human desire to acquire a lot of something with a little effort or doing heavy work by using light energy. Then, gradually human makes an innovation of using natural resources to get convenience in their lives. Until now, humans develop innovations for the use of tools or instruments that can work automatically, for example, bus doors that can open and close automatically because the bus door is automatically controlled by an automatic control system. Automation of a tool or machine is obtained from an *input* and then it is processed to produce an output, which is different, better and more profitable (Stewart et al, 2002).

Automation refers to a conversion of input to the better output. The process of converting *input* into *output* uses control technique. Thus, people use the automatic control system to get an automatic control system. Definition of *control* according to *Deutsche Institut für Normung* (DIN) 19 226: "*Control* means the process in a system in which there are several *input* variable influencing the *output* variable as a result of the laws applied on the system. Controlling is characterized by a sequence of the open circuit movements through a single switching element or control circuit "(Sugihartono, 1992: 4 in Heri Widiantono 2004).

Definition of *Automatic Control* according to DIN 19 226: "Automatic control is a process in which one variable to be controlled (controlled variable) is measured continuously and compared with other variables, the *command variable*, a process that is influenced by the results of this comparison by modifying to adjust the variable command. The resulting movement se-

quence occurs in a closed circuit, the control circuit. The purpose of circuit control is to adjust a value of the controlled variable to the value of the command variable even if equalization is not achieved in this state (Sugihartono, 1992: 4 in Heri Widiantono 2004).

Automation with RFID

RFID or *Radio Frequency Identification* is a method which can be used to store or receive data remotely using devices called RFID tags or transponders. An RFID tag is a small object, such as an adhesive sticker and can be attached to an item or product. RFID tags contain antenna to enable them to receive and respond to a query that is emitted by an RFID transceiver.

There are several factors that affect the successful implementation, namely the relationship of top management, risk level, training for users, user acceptance and management of the implementation process (Turban & Volonino, 2010).

Use of RFID today

Low frequency RFID tags are widely used for identification in animals, keg beer tracking, key lock at car and also anti-theft system. Pets are often plastered with small chips so that they can be returned to their owners if lost. In the United States, there are two RFID frequencies of 125 kHz (the original standard) and 134.5 kHz which is the international standard (Tzeng et al, 2008).

High-frequency RFID tags are used in a library or bookstore, pallet tracking, access control to building, airline baggage tracking and apparel item tracking. This tag is also widely used for identification of badges and replacement of the previous magnetic stripe cards. The badge needs only be held within a certain distance and the reader can immediately recognize the holder of the badge. *American Express Blue* credit cards now contain RFID tags with high-frequency (Ayoub et al, 2009).

UHF RFID tags are commonly used commercially in pallet and container tracking, truck and trailer tracking in shipping yards. Microwave RFID tags are used in long range control access in motor vehicles.

Potential Use of RFID

RFID tags are often considered as a replacement of barcodes. This is because RFID has a wide range of benefits compared to use of barcodes. They probably will not entirely replace barcode technology due to price factor, but in some cases the use of RFID will be very useful. Unique codes stored in RFID could also be long compared with the limited code barcode. The uniqueness of RFID is that the code can be traced from one location to another until the customer's hands. This could help companies' combat theft and other forms of product loss. RFID has also been proposed for use in *point-of-sale* system that replaces the cashier with an automatic machine without having to do barcode scanning. However, this must be accompanied by falling prices of RFID tags to be applied widely in our community (Tajima, 2007).

SWOT Analysis

SWOT analysis is a classical strategic planning instrument. By using the framework of *strengths* and *weaknesses* and *external opportunities* and *threats*, this instrument provides a simple way to estimate the best way to implement a strategy. This instrument helps the planners of what is usually achieved, and what things should be considered by them (Jackson et al, 2003).

SWOT Framework - a 2 x 2 matrix - should be done in a group of key members of the team or organization. First, it is important to know clearly about what the purpose of the key changes and in what the team or organization a SWOT analysis will be undertaken. Once these questions are clarified and agreed upon, one can begin by brainstorming idea and then having it sharpened and clarified in the discussion. Estimation of the *internal capacity* will help identify where a position of the project or or-

Table 1
Strategy Based on a Position of SWOT Matrix

			INTERNAL CONDITION	
			Strengths	Weaknesses
			• Strength • …….. • Strength N	• Weakness 1 • …… • Weakness N
EXTERNAL CONDITION	Opportunities	• Opportunity 1 • …… • Opportunity N	5	6
	Threats	• Threat 1 • …… • Threat N	7	8

ganization today is: what resources can be utilized and what problems have to be resolved (Houben et al, 1999). By doing this we can identify where/when new resources, skills or new partners will be needed. When thinking about strength, it is necessary to think about examples of the real success and what is their explanation. An estimation of the external environment tends to be focused on what is happening outside the organization or on fields that are not yet affecting the strategy but may influence the strategy—both positively and negatively. It's important that we pay attention to what actions and solutions that may arise. Level of correlation should be viewed from 2 sides/directions in the terms of both internal and external conditions (Rangkuti, 2006).

The strategy that can be planned for the institution based on the SWOT matrix is shown in the box numbers 5, 6, 7 and 8 in Table 1.

Technical implementation of the strategic plan is as follows:
Box number 1 is filled with opportunities that can be utilized by the organization.
Box number 2 is filled with threats faced by the organization
Box number 3 is filled with the strength held by organization
Box number 4 is filled with weaknesses faced by the organization
Box number 5 is filled with the strategy presented in the form of development programs which can be used to take advantage of opportunities by utilizing the existing strength.
Box number 6 is filled with the strategy presented in the form of the development program that can be used to reduce the weaknesses by looking at the existing opportunities
Box number 7 is filled with the strategy presented in the form of the development programs that can be used to reduce and to anticipate the threats by looking at the existing strength.
Box number 8 is filled with the strategy presented in the form of the development programs that can be used to reduce the weaknesses and threats that they face.
Inclusion of development programs at boxes 5, 6, 7 and 8 must be sorted by their priority.

The Results of the Previous Studies

Some researchers who have used SWOT analysis with objects of the information technology are Chengiz K et al (2007), Guy G Gable et al (2007), Peter M & Robert GV

Table 2
Results of the Previous Studies

No	Researcher (Year)	Object	Location	Purposes	Position in SWOT	Result
1	Chengiz Kahraman et al (2007)	e-Government	Turkey	The best strategy to run e-government	Thrid Quadrant Strategy	To fix delivery program through IT development at national level
2	Guy G. Gable et al (2007)	Administration Treatment of IT Department	Queensland & Korea	Comparing SWOT Factors	none	As the input for manager about SWOT in each Universities
3	Peter Meyer & Robert G Vambery (2008)	Global Business Strategy	Connectitut, USA	Compare between 2 strategy	none	Improve SWOT Analysis
4	Chun Teh Lee (2010)	Technology Selection	Taiwan	Compare each strategy with SWOT	none	Technology with the best SWOT value will become a choice
5	Ananth Rao & Mahmood A. Awan (2009)	Business to Business (B2B0	Emirate Arab	Analysis strategy suitable for bewari.com	Seqond Quadrant Strategy	To launch the policy for franchise to the company

(2008), Anantth Rao & Mahmood A Awan (2009) and Chun Tea Lee (2010). Their research results are shown in matrix as seen in Table 2.

The difference compared with previous studies is that the current research takes bus station gate automation as an object and is carried out in Surabaya City.

RESEARCH METHOD

Type of Research and Overview of the Research Object

This research was an exploratory study using primary data that would be used to answer some basic problems raised herein. In the exploratory research, any hypothesis is not required so there is no hypothesis testing and the results obtained are descriptions of conditions and the measurement of internal and external conditions on the object of research. Object of the research is Purabaya bus station. The Purabaya station is located at Bungurasih village, Waru subdistrict, Sidoarjo district with an area of ± 12 Ha. This location is intentionally chosen because it has excellent and strategic access as the entrance to the city of Surabaya and is on track out of the city of Surabaya of east, south and west. Although the location of the station exists in Sidoarjo district but the station is under management of the City Government of Surabaya. It is based on a cooperation agreement (MOU) between the Local Government of Sidoarjo and Surabaya Municipal Government.

Population and Sample

The population of this study was drivers and automotive businessmen who use the services of the Purabaya bus station to collect data on external factors, while the population that was used to collect data on internal factor was the employees and the managers of the Purabaya bus station. The population was the sum of the bus station employees totaling 225 people plus the number of bus drivers and businessmen totaling 775 people, so the total samples were 1000 people. The sample of 10% is considered adequate (Nasution, 2003). Therefore, the number of samples in this study was 100 people. The sampling technique used here was *simple random sampling*.

Table 3
Internal Factor Analysis Summary (IFAS)

IFAS Indicators	Group
Conformity with vision & mission	Strength
Relationship with the operating permit	Strength
Parking revenue leakage	Strength
Employee discipline support	Strength
Relationship with the density of vehicles	Strength
Relation to employee income	Weakness
Reduced employees/workforce	Weakness
Investment and maintenance costs	Weakness
Engineering personnel support	Weakness
Facility & infrastructure Support	Weakness

Table 4
External Factor Analysis Summary (EFAS)

EFAS Indicators	Group
Parking time speed	Opportunity
Passenger comfort	Opportunity
Objection to the platform charges	Opportunity
Comfort in getting the passenger	Opportunity
Security assurance	Opportunity
Objection to the increased parking charges	Threat
Rejection against the new system	Threat
Operating Permit Detection	Threat
Fear of gate automation	Threat
Status Quo Attitudes	Threat

Data Collection Method

Data in this study were obtained from the primary data of the employees/managers at Purabaya bus station accounting for internal factors (*strengths* and *weaknesses*), while drivers/automotive businessmen served as external factors (*opportunities* and *threats*). The number of respondents for the internal and external factors should be the same according to the rule of SWOT. Hence, the respondents for the internal factors consisting of the station employees were totaling 50 people, while respondents for the external factors consisting of bus drivers and bus businessmen were 50 people. Responses on the questionnaires were based on Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*).

Identification of Internal and External Factors

Internal factors are the company's strengths and weaknesses. Based on Focus Group Discussion (FGD) confirmed to the Purabaya bus station Surabaya, summary of internal factors or the Internal Factor Analysis Summary (IFAS) is shown in Table.

External factors are the corporate environment composed of opportunities and threats. Based on Focus Group Discussion (FGD) confirmed to the Purabaya bus station Surabaya, summary of external factors or the External Factor Analysis Summary (EFAS) are shown in Table 4.

Table 6
IFAS Scores

No	IFAS Indicators	Scores
1	Conformity with vision & mission	188
2	Parking revenue leakage	207
3	Relation to employee incomes	117
4	Employee discipline support	192
5	Relationship with the density of vehicles	166
6	Relationship with the operating permit	195
7	Investment and maintenance costs	146
8	Engineering personnel support	170
9	Facility & infrastructure Support	127
10	Reduced workforce/employees	177

Table 7
EFAS Scores

No	EFAS Indicators	Scores
1	Fear of gate automation	148
2	Rejection against the new system	158
3	Status Quo Attitudes	109
4	Parking time speed	174
5	Objection to the platform charges	178
6	Comfort in getting the passenger	183
7	Operating Permit Detection	180
8	Passenger comfort	201
9	Objection to the increased parking rates	142
10	Security assurance	207

Research Procedure

Several steps taken in this research included analysis of internal factors (Internal Factor Analysis Summary) and analysis of external factors (External Factor Analysis Summary), and SWOT analysis mapping. A SWOT analysis is used to help find out a strategic position of the Purabaya station gate automation through the identification of internal and external factors. Internal analysis was intended to identify strengths and weakness, while the external analysis was intended to identify opportunities and threats.

Rangkuti (2006) states that the external factors or more known as EFAS (External Factor Analysis Summary) are rated with score greater than 2 (EFAS Score > 2) and equal to or smaller than 2 (EFAS Score ≤ 2). Likewise, internal factors or more known as IFAS (Internal Factor Analysis Summary) are rated with score greater than 2 (IFAS Score > 2) and equal to or smaller than 2 (IFAS Score ≤ 2). IFAS and EFAS scores are calculated as follows:

Several steps taken in calculation of IFAS and EFAS scores

Determine the critical internal factors on the object of research.

Determine the weight of each EFAS and EFAS factor on focus group discussion of the researchers

The overall factor weight is 1 or 100%

Data will be grouped into 4 classes

Determine the interval by subtracting the

Table 8
Conversion Interval

No.	Class Interval	Conversion Scores
1	50 – 100	1
2	101 – 151	2
3	152 – 202	3
4	203 – 253	4

Table 9
Conversion Score of IFAS

No	IFAS Indicators	Scores	Conversion Scores
1	Conformity with vision & mission	188	3
2	Parking revenue leakage	207	4
3	Relation to employee incomes	117	2
4	Employee discipline support	192	3
5	Relationship with the density of vehicles	166	3
6	Relationship with the operating permit	195	3
7	Investment and maintenance costs	146	2
8	Engineering personnel support	170	3
9	Facility & infrastructure Support	127	2
10	Reduced workforce/employees	177	3

Table 10
Conversion Score of EFAS

No	EFAS Indicators	Scores	Conversion Scores
1	Fear of gate automation	148	2
2	Rejection against the new system	158	3
3	Status Quo Attitudes	109	2
4	Parking time speed	174	3
5	Objection to the platform charges	178	3
6	Comfort in getting the passenger	183	3
7	Operating Permit Detection	180	3
8	Passenger comfort	201	3
9	Objection to the increased parking rates	142	2
10	Security assurance	207	4

highest data with the lowest data divided by 4.

Determine the group 1 starting from lowest data plus interval, group 2 is the highest data of group 1 plus interval plus 1, group 3 is the highest data of group 2 plus interval plus 1, and group 4 is the highest data of group 3 plus interval plus 1.

Each factor is scored by multiplying the rating weight by rating each.

Summing the scores of each factor with a maximum value of 4.

The strategy matrix to be applied in the case of Purabaya station gate automation based on focus group discussion (FGD) of the researchers is shown in Table 5.

Table 11
Weights of IFAS Indicators

Ranking	IFAS Indicators	Weight
1	Conformity with vision & mission	0.19
2	Relationship with the operating permit	0.17
3	Parking revenue leakage	0.15
4	Employee discipline support	0.13
5	Relationship with the density of vehicles	0.10
6	Relation to employee incomes	0.09
7	Reduced employees	0.07
8	Investment and maintenance costs	0.05
9	Engineering personnel support	0.03
10	Facility & infrastructure Support	0.02
	Total	1 (100%)

Table 12
Weights of EFAS Indicators

Ranking	EFAS Indicators	Weight
1	Parking time speed	0.19
2	Passenger comfort	0.17
3	Objection to the platform charges	0.15
4	Comfort in getting the passenger	0.13
5	Objection to the increased parking charges	0.10
6	Security assurance	0.09
7	Rejection against the new system	0.07
8	Operating Permit Detection	0.05
9	Fear of gate automation	0.03
10	Status Quo Attitudes	0.02
	Total	1 (100%)

DATA ANALYSIS AND DISCUSSION

Discussion of this study will be divided into two parts, namely a data analysis and discussion. Each section will be discussed as follows:

Data Analysis

The data analysis consists of five parts: IFAS and EFAS values, the values conversion of IFAS and EFAS, IFAS and EFAS factor weight, the calculation of IFAS and EFAS scores, SWOT quadrant position and strategies accordingly.

1. IFAS and EFAS Scores

The Internal Factor Analysis Summary (IFAS) consists of 10 indicators, which are the sum of 50 respondents as seen in Table 6.

The External Factor Analysis Summary (IFAS) consists of 10 indicators, which are the sum of 50 respondents as seen in Table 7.

2. The Score Conversion of IFAS and EFAS

IFAS and EFAS scores will be converted to the nominal score of 1 to 4 according to the theory of SWOT (Freddy, 2002). Minimum value of the indicator is 50, i.e., if all of the respondents answered “disagree” (1) and the maximum value is 250 if all of the respondents answered “strongly agree” (5). Thus,

Table 13
Calculation of IFAS Scores

IFAS Indicators	Weight	Conversion	Conversion×Weight
Conformity with vision & mission	0.19	3	0.57
Relationship with the operating permit	0.17	3	0.51
Parking revenue leakage	0.15	4	0.60
Employee discipline support	0.13	3	0.39
Relationship with the density of vehicles	0.10	3	0.30
Relation to employee incomes	0.09	2	0.18
Reduced employees	0.07	3	0.21
Investment and maintenance costs	0.05	2	0.10
Engineering personnel support	0.03	3	0.09
Facility & infrastructure Support	0.02	2	0.04
Total	1 (100%)		2.99

Table 14
Calculation of EFAS Scores

EFAS Indicators	Weight	Conversion	Conversion×Weight
Parking time speed	0.19	3	0.57
Passenger comfort	0.17	3	0.51
Objection to the platform charges	0.15	3	0.45
Comfort in getting the passengers	0.13	3	0.39
Objection to the increased parking charges	0.10	2	0.20
Security assurance	0.09	4	0.36
Rejection against the new system	0.07	3	0.21
Operating Permit Detection	0.05	3	0.15
Fear of gate automation	0.03	2	0.06
Status Quo Attitudes	0.02	2	0.04
Total	1 (100%)		2.94

the interval value is the maximum value minus minimum value divided by the number of classes of 4.

$$\text{Interval} = \frac{250 - 50}{4} = 50$$

Value conversion interval is presented in Table 8.

Conversion scores of IFAS are shown in Table 9.

Conversion scores of EFAS are shown in Table 10.

IFAS and EFAS Factor Weights

In accordance with the results of discussions with a team of researchers, the factor weight of each IFAS indicator is shown in Table 11.

Factor weights for EFAS indicators are shown in Table 12.

Calculation of IFAS and EFAS Scores

Based on the conversion value and the weights for the 10 indicators of IFAS, the conversion values of the IFAS weights are shown in Table 13.

Conversion values of EFAS weights are indicated in Table 14.

This calculation results in IFAs scores of 2.99 and EFAS scores of 2.94.

Table 15
SWOT Matrix for Gate Automation

IFAS / EFAS	***STRENGTHS (S)*** **Determination of internal strengths (IFAS Score>2)**	***WEAKNESSES (W)*** **Determination of internal weaknesses (IFAS Score≤2)**
OPPORTUNITIES (O) **Determination of external opportunities (EFAS Score>2)**	Purabaya bus station gate automation by *self-management*	Purabaya bus station gate automation through the *engineering personnel outsourcing*
THREATS (T) **Determination of external threats (EFAS Score ≤2)**	Purabaya bus station gate automation by involving the automotive businessmen in planning parking rates system	Bus station gate automation by profit sharing with third parties

SWOT Quadrant Position and the Proper Strategy

With the calculation of the IFAS and EFAS scores above where IFAS score is 2.99 or greater than 2 and EFAS score is 2.94 or greater than 2, then the position in the quadrant SWOT is shown in Table 15.

From the Table 20, we can see that the gate automation at Purabaya bus station has the internal strength (IFAS> 2) and the external opportunities (EFAS> 2). Thus, the appropriate strategy for implementing the gate automation is through self-management.

Discussion

This study shows the best strategy in carrying out the entrance automation at Purabaya bus station Surabaya, in which it is also indicated that Internal Factor Analysis Summary (IFAS) consisted of five weaknesses and five strengths with score larger than 2. This suggests that the company has internal strength. Conversely, the External Factor Analysis Summary (EFAS) consists of five opportunities and five threats with score greater than 2, meaning that the company has external opportunity. The resulting SWOT strategy lies on quadrant one, namely by taking advantage of strength to seize the opportunity. In the case of the gate automation at Purabaya bus station, the form of a strategy of taking advantage of strength to seize the opportunities is done through self-management in the gate automation. RFID technology that will be used here has been shown to have a high success rate, so it is only necessary to procure the RFID from a vendor that possesses a good track record. The supporting operators of the RFID need to be trained by the vendor to achieve a minimum skill level required for its operation.

Comparison with the results of studies of SWOT analysis in the previous Information System project is as follows:

Chengiz Kahraman, Nihan Cetin Demirel & Tufan Denirel (2007) examined the e-Government in Turkey. The purpose of the research is to get the best strategy in running the e-Government in Turkey. There are seven internal factors (3 strengths and 4 weaknesses), comprising three strengths namely the establishment of supervision and the special committee, the e-Transformation project and support from the top management of the public and private sectors, while the four weaknesses are the absence of internet access among several sections of the population, lack of funds for capital investment in this new technology, lack of culture to perform a transaction electronically at national level, the weak economy and business. Then, there are 7 external factors (3 factors of opportunities and 4 factors of threats), comprising three factors namely the

public information perspective for European Union countries, the efficiency by reducing costs and multi-layered processes, the organization habit by restructuring the new and better service. The four threats are unintegrated Internet regulation, inadequate IT security from the government, the lawsuits of copyrights and the availability of the "harmful" information. Results of SWOT analysis indicate the position of quadrant 3, namely taking advantage of the strengths to avoid the threats. This strategy is realized by improving project delivery through development, recruitment and retention of a qualified IT workforce at the national level. This research is similar to the previous studies using a SWOT analysis; the object is an information system and there are alternative strategies in each quadrant of the SWOT. The difference is the number of internal and external factors, the position of the quadrant of the research results and study location.

Guy G. Gable, Robert W. Smyth, Jae-Nam Lee & Jaemin Han (2007) examined the differences in disciplines for the placement of IT majors at Queensland University of Technology and the Korea University. The objective of the research was to provide an overview to the university president about situation of IT majors when placed on the discipline of business and discipline of a separate science. The phenomenon of displacement in the IT majors of the business to the computer science is attractive to the researchers' attention. SWOT analysis has been used to build seven factors of strength, 5 factors of weakness, 4 factors of opportunity and 3 factors of threats. The result is the exploration of primary and secondary data for comparing the profile of IT major when placed on the discipline of business and the profile of IT major when placed on a separate discipline. The results of the study are useful for making a decision about placement of the IT major at Queensland University and Korea University. This study is similar to our study of using a SWOT analysis. The difference is the number of internal and external factors; no strategy produced and research location.

Peter Mayer & Robert G. Vambery (2008) investigated global business strategy in Connecticut USA. The objective of this research was to discuss the strategy applied in the Product Life Cycle (PLC) and the strategy offered in the SWOT analysis. From the experiences of British Petroleum Company (BP) and General Electric, the SWOT only shows a factor that is significant to the change (SWOTCHi) and PLC also displays a factor which is significant to the change (PRCL). In this way the General Electric has been able to combine the PRCL analysis and SWOTCHi to produce a global business strategy for the company. The results of the combined two techniques have resulted in three alternative strategies for companies. The three strategies are modification or improvement of the current products, introduction of new products on the current product market and introduction of new functions in products that are available today. As similarity to our study, this study discusses the SWOT analysis technique. The difference is that there is another PLC method used here and the incorporation of 2 technical analytical strategies in generating global business strategy.

Chun Teh Lee (2010) investigated the determination of the SWOT score ranking in the various S-Company products in Taiwan. There are 7 variables of the market strengths used here, including market size, growth rate, price, profitability, technological sophistication, the level of competition and government regulation. Several classifications of products under study is the finished product and component product. The finished products under study include computers, cable communications, wireless communications, multimedia, image sensors, video games, displays, digital consumer, storage, IC Cards and GPS. The highest score is achieved for computer products at 4:15 while the lowest is the GPS at 1.0. Furthermore, the component products under study are microprocessor, core logic and graphics, microcontrollers, PLDs, imaging

sensors, power controllers, LCD drivers, cellular phone baseband, RF transceivers, networking devices and memories. The highest score achieved for the component product of the memory is 4.1, while the lowest is RF transceivers at 0.8. The similarity is that it discusses the SWOT analysis technique. The difference is the determination of SWOT score ranking for various products produced by a company.

Ananth & Mahmood (2009) examined Business to Business (B2B) in a company in Dubai. The objective of the research was to get the best strategy for a B2B company of Bewari. Starting with analysis of PORTER industry, the Bewari's company profile was analyzed using a SWOT technique. Internal factors analyzed in the company consisted of 3 strengths and two weaknesses, while external factors analyzed consisted of 3 opportunities and 3 threats. There are four alternative strategies in SWOT quadrant. The first quadrant is the participation through the JV; the second quadrant is the franchise issue; the third quadrant is the internal B2B acquisition and the fourth quadrant is a spin-off innovation. Results of the SWOT analysis indicate a weakness, but there is a opportunity on the second quadrant. Thus, the appropriate strategy is to minimize the weakness to seize the opportunities. This strategy can be accomplished with franchise on the second quadrant. The similarity lies on the use of SWOT analysis and there is alternative strategy in each quadrant of the SWOT. The difference is the number of internal and external factors, the object of research, the position of the quadrant of research results and research setting.

In general, the previous researchers have found some findings and they were divided into two categories, the first category was to find factors of Strengths, Weaknesses, Opportunities and Threats (SWOT) of an object under study and the second category was to measure the Strengths, Weaknesses, Opportunities and the Threats of a research object. The findings in this study are included in the second category where the Strengths, Weaknesses, Opportunities and Threats measured to the respondents who were directly have the interest to the gate entrance automation. As far as the Strengths and Weaknesses factors that have the direct interest are the internal staffs of Purabaya bus station, while the factors of Opportunities and Threats that have a direct interest is the bus drivers and the bus owners who use Purabaya bus station.

CONCLUSION, IMPLICATION, SUGGESTION AND LIMITATIONS

Regarding the hypothesis stating that where is the quadrant position of the Purabaya bus station gate automation in the SWOT diagram, the results of the research show that the IFAS score is 2.99 or greater than 2 and EFAS score is 2.94 greater than 2. Thus, the proper quadrant position in SWOT matrix lies on quadrant 1, which means taking advantage of strengths to seize the opportunity. Furthermore, the second hypothesis states that the most appropriate strategy in accordance with the position of the quadrant on the SWOT matrix. In this case, the most appropriate strategy is on quadrant 1. This strategy is realized by taking advantage of the existing strengths to seize opportunities. The opportunity here is self-management of the station gate automation. RFID technology for use in the gate automation has been shown to have a high success rate, so it is only necessary to procure it from a vendor with a good track record. The supporting operators of the RFID need to be trained by the vendor to achieve a minimum skill level required for its normal operation.

The implications implementation of the gate automation with self-management strategy is the management of Purabaya bus station must prepare a special team that will implement the gate automation. The special team will be tasked to plan in detail about the phase of the project, and then organize the implementation of the project. In every phase of the project, the management must direct the team to reach the target in each phase of the implementation and controlling

the cost in order not to exceed a predetermined budget.

Based on the above conclusions, it is suggested that the management of the station Purabaya is quantitatively inventarizing the strengths and opportunities to achieve potential profits of both material and non-material thereby the feasibility study of the business can be conducted. From the results of the feasibility study, we can predict clearly when the break event point (BEP) can be reached and when a profit of the project begins to be accomplished. Suggestion for further research is that the respondents for external factors need to be extended to include stakeholders having interests on the existence of Purabaya bus station, bus users, community members living around the station location, the government, banks and others, so that research results are expected to be more comprehensive.

Limitations of this study is that an identification of the strengths and weaknesses in the implementation of the gate automation is mainly limited to the employees and the managers of the Purabaya bus station, while an identification of the opportunities and threats is limited to the drivers and automotive businesses only. Internal factors which have not been considered in this study is the internal auditing and management of public transport in Surabaya. External factors that have not been considered in this study are the bus users, the community members surrounding the location of the station, the government and other stakeholders.

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