FEASIBILITY STUDY OF INVESTMENT ON ACADEMIC INFORMATION SYSTEMS STIKES PEMKABJOMBANG BASED ON INFORMATION ECONOMICS

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Abstract

Growth in information technology make an impact and changes in business processes at most industries, especially at health academy. Based on need of the management of health academy to provide academic services are professional then an academic information system that connects the management, faculty, students, and all entities involved is a matter that ought to exist. Accountability and transparency of data into more value with academic information system implementation. An Investment Information Systems Information Technology (IT / SI) generally require a feasibility study as well as the calculation of benefits and advantages before the investment. Several approaches are used to calculate the benefits and advantages of IT investment / SI, one of which is the Information Economics (IE) Approaches Information Economics is used in the analysis of an IT investment / SI and the development of Traditional Cost and Benefit Analysis (TCBA) involving factors economically justified business and technology in the form of financial, benefits, and risks of IT / SI them. Excellence IE method lies in its ability to take into account the benefits that half of tangible and intangible that is often overlooked by the management / investor. Brand Image Valuation is used as a subsidiary method for calculating the value of changes in the value of the brand image of STIKES Pem Kab Jombang of academic information systems investments. The results of the feasibility study on the investment of academic information STIKES Pem Kab Jombang is the investment worth to implementation because give benefit such as ROI of 43.29%, NPV Rp. 238,245,255.26, and the payback period 10.09 month

Keywords: *Information Economics(IE),Brand Image Valuation, Tangible Benefit, Intangible Benefit, Academic System Information*

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1. INTRODUCTION

Quick and Rapid Developments in information technology, making the accuracy and speed of getting information in a organization or corporation. Improvement on Information technology increasingly efficient on every business process STIKES PemKab Jombang. Implementation of software development which could be increasingly should conform with the vision and mission of STIKES. It is expected to have contributed to STIKES on tangible or intangible benefit. However, before entering in the process of implementation required another stage to conduct a feasibility study of an information technology investment. The feasibility study is important to know whether the investment is profitable for the management and determine the contribution resulting from the investment

Base On Survey [1], 51% corporation never evaluate their investment on information technology, even 68% corporation did not compare their benefit base on investment. It huge mistake from corporation did not calculate their benefit from their investment. Some Framework could use to find out benefit from Information Technology (IT) investment such as Information Economics (IE), *Total Economic Impact* dan VAL IT. In this study, the authors chose to Information Economics (IE) developed by Parker to link business performance with information technology. In this model, the benefits are determined by the approach financially and non-financially. It could be to find out tangible and intangible benefit from investment IT.

Investment on IT should be increasingly brand image corporation, in this study, author used computational approach to find out benefit of brand image valuation after implementation IT investment

1.1 Information Economics (IE)

Information Economics (IE) is a computational approach introduced by Marilyn M. Parker along with a team of IBM in 1985 to quantify the costs (cost) and benefits (benefits) of a project of IS / IT. This method is a improvement of the Cost-Benefit Analysis (CBA) [2].

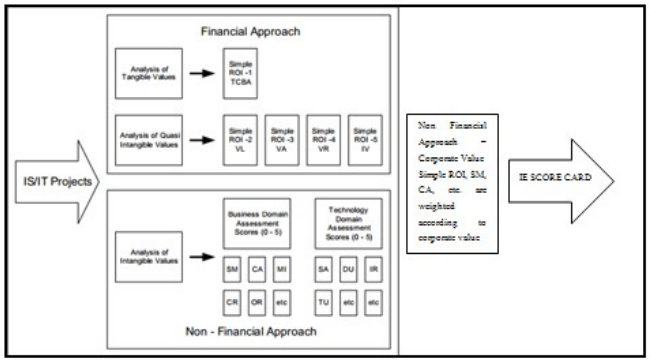

Fig 1. Information Economics (IE) Framework

From figure 1, framework for assessing investment using IE methodology which generate a score of investment IT and Economic value. IE framework is divided into two aspect, financial and non-financial. Financial aspects itself consists of tangible and quasi tangible benefit. While the non-financial aspects consists of two business domains business and technology domain

Tangible Benefit

The benefit which effecting directly on corporate profits. analysis of the tangible benefit or quantitative use ROI-simple calculation method Traditional Cost Benefit Analysis (TCBA)

Quasi Tangible Benefit

The benefits that are in the grey area because of these benefits take effect directly against profits but hard to quantify or otherwise, is not directly affect profits but can be calculated. For example, improve the planning process, making improvements decisions etc. Analysis on the quasi benefits of using several types :

1. Value acceleration (VA): acceleration obtaining benefits and savings costs due to the relationship of two functions in a causal relationship, usually triggered by a time or improvements in other parts (ripple effect).
2. Value linking (VL): Improved performance one or more business functions for their implementation without time-bound technology.
3. Value restructuring (VR): refers to the value associated with a job or function parts; measured by the increase productivity gained from the business on a part of the activity with lower benefits be increased higher.
4. Innovation valuation: application / IT innovative driving force inchanges in business strategy, products and services.

Business Domain

Business domain consists of several points such as

1. Strategic match: the benefits of information technology is measured by how much support to the achievement of the strategic objectives of the organization or the amount of contribution to the operational activities of the organization for the purpose achieve goals.
2. Competitive advantage: the benefits of information technology is measured through contribution to the achievement of organizational competitive advantage. Thus, the technology projects that support inter-organizational systems (inter-organizational system) have higher benefits.
3. Management information support: the contribution of information technology projects to the need for information management in decision making.
4. Competitive response: the benefits of information technology projects is measured by how much the risk of competition if the project is delayed or not implemented. The more the project can not be delayed, its relevance is high.

Technology Domain

Technology domain consists of several points such as

1. Strategic match: the benefits of information technology is measured by how much support to the achievement of the strategic objectives of the organization or the amount of contribution to the operational activities of the organization to achieve goals.
2. Competitive advantage: the benefits of information technology is measured through contribution to the achievement of organizational competitive advantage. Thus, the technology projects that support inter-organizational systems (inter-organizational system) have higher benefits.
3. Management information support: the contribution of information technology projects to the need for information management in decision making.
4. Competitive response: the benefits of information technology projects is measured by how much the risk of competition if the project is delayed or not implemented. The more the project can not be delayed, its relevance is high.

1.2 Brand Image Valuation

According to the Association Marketing American (AMA) [3], a brand is a "name, term, sign, symbol, or design, or a combination of them, intended to identify the goods and services of one seller or group of sellers and to differentiate Them form Reviews those of competition. Keller[4], “brand image as perceptions about a brand as reflected by the brand association held in consumer memory”. There are several approaches to calculate the value of the brand image of an organization. The approach most commonly used and has also been used as a reference by the US GAAPs (Generally Accepted Accounting Principles) is a financial approach.

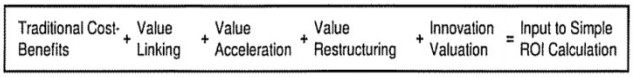

Fig 2. ROI Calculation from Information Economics

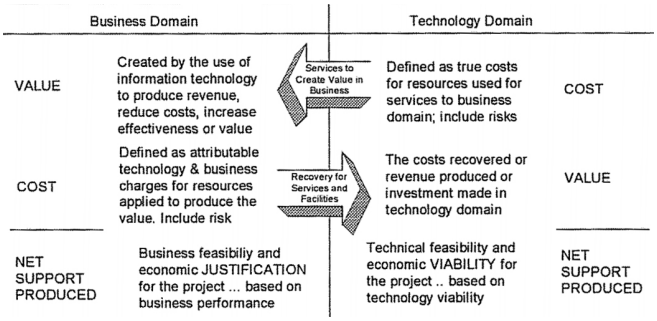

Fig 3. Technology and business domain

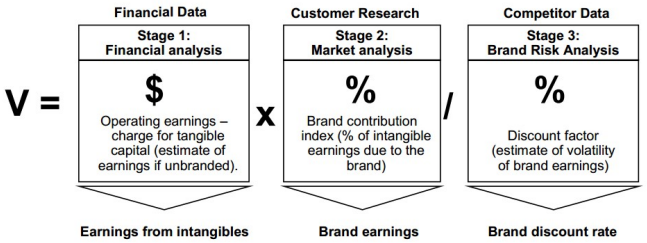

Fig 4. Brand Image Valuation Calculation

2. METHODOLOGY

In this chapter will discuss the research methods for the how to measure benefit for investment IT based on Information Economics and Brand Image Valuation.

2.1 Collecting Data and Scope of Project

Gain information needed in order to achieve the research aim. Data collected by the sample predetermined. The sample consists of units set analysis as research targets. Activities undertaken in this regard phase includes literature studies, institutional studies documents, interviews and observation. Scale project consists of detailed information on the implementation of IT so cost of it could be calculated and predicted as long as written on document of scope project

2.2 Cost Analysis

Determined of Cost from implementation investment IT could be calculated from document scope of project. Cost to accomplish investment IT could be two types cost, initial or development cost and maintenance cost.

2.3 Benefit Analysis

Find out of benefit from investment IT should be compare process business before and after implementation investment IT. Tangible and Intangible benefit could be written after define impact on process business. Result from this method is list of benefit from investment IT. It could be tangible, value linking, value acceleration, innovation which has been defined by Information Economics framework

2.4 Financial Analysis

Financial Analysis related with Return of Investment(ROI) and Net Present Value(NPV) investment IT. Before find out ROI and NPV, to formulas how many benefit on financial statement, must calculated all of benefit that found out in step method 2.3. if benefit are not tangible, should be calculated use questionnaire or observation to change intangible to tangible benefit. Result on this step are NPV ,ROI and Score Project base on information economics before impacted brand image valuation from all tangible or intangible benefit which has been calculated.

2.5 Brand Image Valuation

Brand image Valuation is measure how brand image of organization which implement investment IT could increase or decrease from customer perspective. Measurement from customer using questionnaire before implementation and explain new process business after implementation.

2.6 Feasibility Investment

Feasibility investment IT calculated from NPV and ROI. NPV and ROI used for feasibility study is calculated from sum of result financial analysis and brand image valuation.

3. DATA ANALYSIS

In this chapter will discuss analysis data from investment IT, Information Academic at STIKES PemKab Jombang. Data obtained several ways such as institutional studies documents, interviews and observation. Every Data processed by information economics framework and brand image valuation.

3.1 Benefit of Investment Information Academic

Improvement on business process become a main part to define benefits of investment. An Investment always make impact on process business. It could be formulas with find out every detail on process business that changed after investment. See figure 5

3.2 Tangible Benefit

List of benefit from step 3.1 splited into tangible benefit and intangible. Tangible that found out such as decrease of use paper and ink. Every tangible benefit calculated into financial value. See figure

3.3 Value Linking, Value Acceleration, and Innovation Value

Every intangible benefit should be categorized into quasi tangible benefit such as value linking, Acceleration, Restructuring and innovation value. See figure

3.4 Business and Technology Domain

Business and technology domain is determine the intangible benefit gained from a management point. In Information Economics, these two domains were measured using a questionnaire and weighting.

3.5 Information Economics Project Score

Weighting given to each point of the business and technology domains so as to produce the project's value is based on information economics. weighting is done by top management .

3.6 Brand Image Valuation

Data brand image valuation obtained from students and prospective students. Both of them given questionnaire to measure brand value before investment and predictable brand value after investment. Comparing two values of brand value deliver a brand image valuation.

3.7 Feasibility Investment IT

Feasibility study on investment IT at this case using calculated financial benefit and brand image valuation. Financial statement after summary two step have been described previously.

No	Modul Sistem Informasi	Identifikasi Nilai	Jenis Nilai
1	Form Online Study (FRS)	Decrease paper and ink	Tangible Benefit
		Transparancy and accuntability data	Value Linking
		Efficient distributed data	Value Linking
		Effiecient input data	Value Linking
		easier and faster verification form online study	Value Acceleration
		efficient and faster generate report	Value Acceleration
		Restructuring Human Resource	Value Restructuring
		easier and faster access form online study and course	Value Acceleration
		easier and faster generate course schedule	Value Acceleration
2	Admission of New Student	Decrease paper and ink	Tangible Benefit
		easier and faster verification new admission	Value Acceleration
		efficient of admission	Value Linking
		Decrease paper and ink for admission form	Tangible Benefit
		Efficient distributed data	Value Acceleration
		efficient and faster generate report	Value Acceleration
		Transparancy and accuntability data	Value Linking
3	Online Journal	easier and faster verification admission journal	Value Linking
		efficient to search journal	Value Acceleration
		flexibility saving data on server	Value Linking
4	Internship and Vacancy	Faster distributed information	Value Acceleration
		efficient and faster generate report	Value Acceleration
		Decrease paper and ink	Tangible Benefit

Fig 5. Benefit of Investment IT

A	Net Investment Required (Development Worksheet)						IDR 204,593,600.00
B	Yearly Cash flow base on five years period						
		IDR 1.00	IDR 2.00	IDR 3.00	IDR 4.00	IDR 5.00	
	Net Economic Benefit						
	Operation Cost reduction	IDR 3,952,970.00	IDR 4,220,190.77	IDR 4,505,475.67	IDR 4,810,045.82	IDR 5,135,204.92	
	On Goin Expense	IDR 8,250,000.00	IDR 27,596,220.00	IDR 20,337,476.21	IDR 35,710,253.63	IDR 48,097,959.64	
	Net Cash Flow	IDR (4,297,030.00)	IDR (23,376,029.23)	IDR (15,832,000.54)	IDR (30,900,207.81)	IDR (42,962,754.72)	IDR (117,368,022.30)
	NPV	IDR (3,897,532.88)	IDR (21,202,747.60)	IDR (14,360,091.19)	IDR (28,027,399.37)	IDR (38,968,485.01)	IDR (106,456,256.05)
C	Simple ROI Calculation						-10.41%

Fig 6. Analysis Financial Tangible Benefit

A	Net Investment Required (Development Worksheet)						IDR 204,593,600.00
	Yearly Cash flow base on five years period						
		1	2	3	4	5	
B	Net Economic Benefit						
	Operation Cost reduction	IDR 3,952,970.00	IDR 4,220,190.77	IDR 4,505,475.67	IDR 4,810,045.82	IDR 5,135,204.92	
	Benefit from form study online	IDR 8,526,959.09	IDR 9,103,381.53	IDR 9,718,770.12	IDR 10,375,758.98	IDR 11,077,160.28	
	Benfit from new student admission	IDR 48,339,681.82	IDR 51,607,444.31	IDR 55,096,107.54	IDR 58,820,604.41	IDR 62,796,877.27	
	Benefit from online journal	IDR 2,869,602.27	IDR 3,063,587.39	IDR 3,270,685.89	IDR 3,491,784.26	IDR 3,727,828.88	
	Benefit from Internship and Job Vacancy	IDR 2,535,090.91	IDR 2,706,463.05	IDR 2,889,419.96	IDR 3,084,744.75	IDR 3,293,273.49	
	Benefit from innovation value	IDR 13,500,000.00	IDR 14,412,600.00	IDR 15,386,891.76	IDR 16,427,045.64	IDR 17,537,513.93	
	Total Benefit	IDR 79,724,305.09	IDR 85,113,669.05	IDR 90,867,353.94	IDR 97,009,987.86	IDR 103,567,863.77	
	On Goin Expense	IDR 8,250,000.00	IDR 27,596,220.00	IDR 20,337,476.21	IDR 35,710,253.63	IDR 48,097,959.64	
	Net Cash Flow	IDR 71,474,305.09	IDR 57,517,449.05	IDR 70,529,877.73	IDR 61,299,734.23	IDR 55,469,904.13	IDR 316,291,270.23
	NPV	IDR 64,829,301.67	IDR 52,170,021.81	IDR 63,972,678.21	IDR 55,600,665.97	IDR 50,312,838.22	IDR 286,885,505.88
C	Enhanded ROI Calculation						28.04%

Fig 7. Analysis Financial Tangible and Intangible Benefit

Evaluator	Domain bisnis						Domain Teknologi				Weighted
	ROI	SM	CA	MI	CE	OR	SA	DU	TU	IS	Score
	+4	+4	+5	+2	+4	-2	+4	-2	-3	-3	
Business Domain	4	4	5	3	3	4					
Technology Domain							3	3	3	4	
	16	16	25	6	12	-8	12	-6	-9	-12	52

Fig 8. Business and Technology Domain

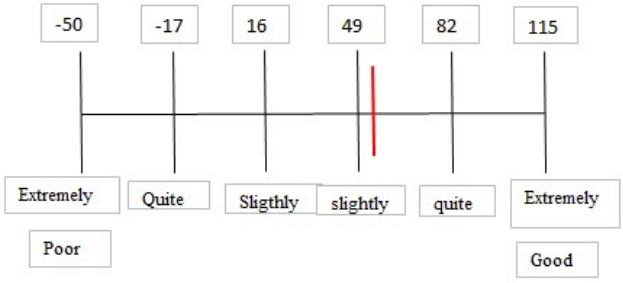

Fig 9. Information Economics Scorecard

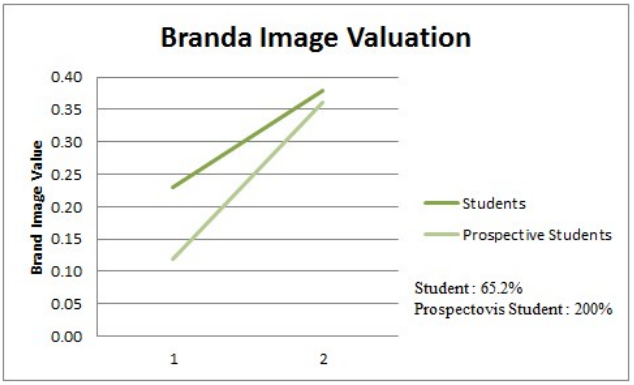

Fig 10. Brand Image Valuation

A	Net Investment Required (Development Worksheet)						IDR 204,593,600.00
	Yearly Cash flow base on five years period						
		1	2	3	4	5	
B	Net Economic Benefit						
	Operation Cost reduction	IDR 3,952,970.00	IDR 4,220,190.77	IDR 4,505,475.67	IDR 4,810,045.82	IDR 5,135,204.92	
	Benefit from form study online	IDR 8,526,959.09	IDR 9,103,381.53	IDR 9,718,770.12	IDR 10,375,758.98	IDR 11,077,160.28	
	Benfit from new student admission	IDR 48,339,681.82	IDR 51,607,444.31	IDR 55,096,107.54	IDR 58,820,604.41	IDR 62,796,877.27	
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	Benefit from innovation value	IDR 13,500,000.00	IDR 14,412,600.00	IDR 15,386,891.76	IDR 16,427,045.64	IDR 17,537,513.93	
	Benefit Brand Image Valuation	IDR 171,938,582.69					
	Total Benefit	IDR 251,662,886.78	IDR 85,113,667.05	IDR 90,867,350.94	IDR 97,009,983.86	IDR 103,567,858.77	
	On Goin Expense	IDR 8,250,000.00	IDR 27,596,220.00	IDR 20,337,476.21	IDR 35,710,253.63	IDR 48,097,959.64	
	Net Cash Flow	IDR 243,412,886.78	IDR 57,517,447.05	IDR 70,529,874.73	IDR 61,299,730.23	IDR 55,469,899.13	IDR 488,229,837.92
	NPV	IDR 220,782,663.75	IDR 52,170,020.00	IDR 63,972,675.49	IDR 55,600,662.34	IDR 50,312,833.68	IDR 442,838,855.26
C	Enhanded ROI Calculation						43.29%

Fig 11. Feasibility Financial after Brand Image Valuation

4. CONCLUSION

After several step calculation and formulas could be concluded that

1. Implementation of academic information systems feasible to be implemented, although this implementation more increase the benefits are intangible.
2. ROI of academic information system implementation is 43.29% with NPV Rp. 238,245,255.26, and the month payback period 10:09
3. Changes in business processes that have the greatest impact in benefits is the implementation of new student admissions, followed by the form online.

This study has shown that by focusing on staff, lecturer, top management, students, and prospective student to find out impacted business process. For further research, it should be comparing with competitors where define weight of every detail on business and technology domain. furthermore, every costto develop human resource which be an user on that software should be calculated to improved of accuracy

REFERENCES

[1]. Dekleva, Sasha (2005). Justifying Investment in IT.Journal of information Technology Management Volume XVI, Number 3 2005.Depaul University.

[2]. Remenyi, Dan, Arthur Money, and Michael Sherwood-Smith with ZahirIrani. (2001). The Effective Measurement and Management of IT Costs and Benefits, 2nd Edition. Butterworth Heinemann, Britain.

[3]. Keller, Kevin Lane, 2003. Strategic brand management: building, measuring, and managing brand equity. New York: Prentice Hall

[4]. Kotler, Philip. & Keller, Kevin Lane. 2006. Marketing Management. 12 Edition. New Jersey: Prentice Hall International