

Implementation Zachman Framework for Design and Analysis Commercial Web

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Abstract - Technology Acceptance Model is one of the most popular research models to predict use and acceptance of information systems and technology by individual users. TAM has been widely studied and verified by different studies that examine the individual technology acceptance behavior in different information systems constructs. In this research use implementation of Zachman Framework for design and analysis commercial website that is PT Rikola and compare with another website (PT Nusantara Tour and Travel). The research objectives is to design and analysis the implementation of Zachman Framework for commercial web. In this research, using Zachman Framework version 3, the sample is data input the company information about data consumers, data suppliers, products, etc. and the questionnaires will be spread on the users that use the company website that is PT Rikola Tour and Travel in Semarang. Based on the analysis and the result, so the conclusion in this research are: (1) Design of the commercial web for PT Rikola Tour and Travel is good implementation because there is significant difference between before implementation and after implementation. (2) The analysis of Zachman Framework for Commercial Web reflected the best solution because describe the more comprehensive coverage for all enterprise architecture stakeholders.

Keywords: TAM, Zachman Framework, Commercial Web.

Introduction

Nowadays the most important assets of a company is not only product and service, but also the information technology. One of the development of information system is website in order to widespread the information content into the other side. The information systems literature contains an extensive and long standing tradition of research that focuses on explaining the acceptance of information technology from the user's perspective. Perhaps the best contributions in predicting and explaining user acceptance of computer technology in organizational contexts have been made by the Technology Acceptance Model (TAM) (Venkatesh and Davis, 2000). The central focus of the TAM is that individual computer acceptance is determined by two instrumental beliefs: perceived usefulness (i.e. the extent to which a person believes that using the system will improve his/her job performance) and perceived ease of use (i.e. the extent to which a person considers that using the system will be free of effort). Therefore, this model represents the current thinking in the field of information systems about user acceptance of computer technology. Whereas some research has been done to model the effects of different external variables, TAM needs to be broadened to encompass other important theoretical constructs which need to be tested within an integrated nomological net of variables. Such integrated models depart from prior research on innovation adoption and computer acceptance, which has focused primarily on either first order effects of acceptance determinants or antecedents of perceived

usefulness or ease of use separately (Venkatesh and Davis 2000). Despite the extensive study of TAM, the impact of social influences and norms on acceptance remains one of the poorly understood aspects of technology acceptance. The prior studies on TAM investigate the role of social influences from a general standpoint, namely that of important others. Consequently, these social influences are not adapted to a personal selling context.

TAM is strongly supported in a personal selling context (Schillewaert et al., 2000). Technology Acceptance Model is one of the most popular research models to predict use and acceptance of information systems and technology by individual users. TAM has been widely studied and verified by different studies that examine the individual technology acceptance behavior in different information systems constructs. In TAM model, there are two factors perceived usefulness and perceived ease of use is relevant in computer use behaviors. Davis defines perceived usefulness as the prospective user's subjective probability that using a specific application system will enhance his or her job or life performance. Perceived ease of use (EOU) can be defined as the degree to which the prospective user expects the target system to be free of effort (Davis, 1989).

Zachman Framework is an architecture or framework that contained formal and structured view for an organization. Zachman Framework also provide an organization with a design, documents, specifications, and models for manage and using information. One dimension of the Zachman classification matrix is based on six interrogatives (What, How, Where, Who, When, and Why); the other dimension is based on six stakeholder groups (Visionary, Owner, Designer, Builder, Implementer and Worker). The classification matrix is intended to provide a holistic view of the enterprise architecture which is being modeled. So it can be say that Zachman Framework will be very important for an organization. Zachman Framework is selected because its advantage. The advantages of the Zachman Framework are contained an integrated approach such as the matrix consists of all stakeholders and organization need. In this research use implementation of Zachman Framework for design and analysis commercial website that is PT Rikola and compare with another website (PT Nusantara Tour and Travel).

Literature Review Tam (Technology Acceptance Model)

Based on established pertinent theoretical foundations and literature, a research model has been employed to

investigate the technology acceptance factors that influence the adoption of online shopping within the context of Malaysian consumers. The TAM has emerged as a powerful model in investigating the acceptance and use of information technology (Davis in Park, 2009). The choice for using TAM as a research model to explain consumers' online shopping adoption is attributed to its consistent capability to explain a substantial portion of variances between behavioural intention and actual behaviours derived mainly from research into the purchase of technology related products (Bobbitt & Dabholkar, 2001; Goldsmith, 2002; Grabner-Krauter & Kaluscha, 2003; Hanque, et al., 2006; King & He, 2006). The TAM postulates that the perceptions or beliefs about the innovation are instrumental in the development of attitudes that will eventually result in system utilization behaviour. It also posits that the actual system use is determined by each user's behavioural intention to use, which is in turn influenced by each user's attitudes towards use. Finally, the attitude is directly affected by the usefulness and ease of use of the system. Although this model was originally conceived to model the adoption of information systems in the workplace, scholars in the area of consumer behaviour have identified two specific dimensions which are relevant to online shopping: perceived ease of use and perceived usefulness (Gefen, et al., 2003; Huang, 2008).

TAM is one of the most influential extensions of Ajzen and Fishbein's theory of reasoned action (TRA) in the literature. It was developed by Fred Davis and Richard Bagozzi. TAM replaces many of TRA's attitude measures with the two technology acceptance measures— ease of use, and usefulness. TRA and TAM, both of which have strong behavioural elements, assume that when someone forms an intention to act, that they will be free to act without limitation. In the real world there will be many constraints, such as limited freedom to act Bagozzi, Davis and Warshaw say: Because new technologies such as personal computers are complex and an element of uncertainty exists in the minds of decision makers with respect to the successful adoption of them, people form attitudes and intentions toward trying to learn to use the new technology prior to initiating efforts directed at using. Attitudes towards usage and intentions to use may be ill- formed or lacking in conviction or else may occur only after preliminary strivings to learn to use the technology evolve. Thus, actual usage may not be a direct or immediate consequence of such attitudes and intentions (Bagozzi, Davis & Warshaw, 2002). Earlier research on the diffusion of innovations also suggested a prominent role for perceived ease of use. Tornatzky and Klein that analysed the adoption, finding that compatibility, relative advantage, and complexity had the most significant relationships with adoption across a broad range of innovation types. Eason studied perceived usefulness in terms of a fit between systems, tasks and job profiles, using the terms "task fit" to describe the metric. Legris, Ingham & Colletette (2003) suggest that TAM must be extended to include variables that account for change processes and that this could be achieved through adoption of the innovation model into TAM.

Zachman Framework

The Zachman Framework is an enterprise architecture framework which provides a formal and highly structured way of viewing and defining an enterprise. It consists of a

two dimensional classification matrix based on the intersection of six communication questions (What, Where, When, Why, Who and How) with five levels of reification, successively transforming the most abstract ideas (on the Scope level) into more concrete ideas (at the Operations level). As shown in the table number 2.1 (Pereira and Sousa, 2004). The Abstractions, the other dimension of the classification system, depict the independent variables that constitute a comprehensive depiction of the subject or object being described, including:

1. Why do things happen - the ends/means - for Enterprises, the Motivation Models (column 1).
2. How it works - the functional specification, the transformations - for Enterprises, the Process (or Function) Models (column 2).
3. What it is made of - the material composition of the object, the bill-of materials-for Enterprises, the Thing (Data) Models (column 3).
4. Who does what work - the manuals, the operating instructions - for Enterprises, the People (or, Work Flow) Models (column 4).
5. Where the components are located relative to one another - the geometry, the connectivity - for Enterprises, the Logistics (or Network) Models (column 5).
6. When do things happen relative to one another - the life cycles, the timing diagrams - for Enterprises, the Time (or, Dynamics) Models (column 6).

The Zachman Framework is a schema for organizing architectural artifacts (in other words, design documents, specifications, and models) that takes into account both whom the artifact targets (for example, business owner and builder) and what particular issue (for example, data and functionality) is being addressed. The Zachman Framework is not a methodology in that it does not imply any specific method or process for collecting, managing, or using the information that it describes (Zachman, 2003).

The framework is named after its creator John Zachman, who first developed the concept in the 1980s at IBM. It has been updated several times since the first time published. The advantages of the Zachman Framework approach include an intuitive classification matrix which provides comprehensive coverage for all enterprise architecture stakeholders.

Commercial Website

A website, also written as Web site, or simply site, is a set of related web pages served from a single web domain. A website is hosted on at least one web server, accessible via a network such as the Internet or a private local area network through an Internet address known as a Uniform resource locator. All publicly accessible websites collectively constitute the World Wide Web. The rapid development of the World Wide Web has allowed people, as never before, to access information and interact globally with new markets and products (Zviran et al., 2005).

Research Method

In this research, using Zachman Framework version 3, the sample is data input the company information about data consumers, data suppliers, products, etc. and the

questionnaires will be spread on the users that use the company website that is PT Rikola Tour and Travel in Semarang. The advantages of Zachman Framework version 3 is still based on the key principles and ideas and have some new insights rather than version 1 and 2. The samples is 50 users (customers) and 15 staff of website of PT Rikola Tour and Travel, Semarang. The sampling method used are quota sampling, that is the sampling method which the researchers determine first the number of respondents. According to Sugiyono (2010) the minimum samples for

simple research is 30 respondents, so the writer pick up 30 samples that is customers of Rikola Tour and Travel, Semarang. Then technique analysis used is Validity and Reliability testing, also Paired sample t-test.

Analysis and Interpretation

The first step is designing Website PT Rikola Tour and Travel. The language program of this website as below:

```
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
<title>Rikola Tours & Travel</title>
<link rel="stylesheet" href="include/tours_travel.css" type="text/css" />
<script language="JavaScript" type="text/javascript">
<!--
// test script to rotate the cabinet images on the main page
var ImgPath='images/';
var ImgAry=["header.png","1.jpg","2.jpg","3.jpg","4.jpg","5.jpg"];
var SRCary=[]
for (var zxc0=0;zxc0<ImgAry.length;zxc0++){
SRCary[zxc0]=new Image();
SRCary[zxc0].src=ImgPath+ImgAry[zxc0];
}
var Cnt=0;
function initializeTimer() {
document.getElementById("Tst1").src=SRCary[Cnt].src;
timerID = setInterval('chgImage()', 1000) // change the image every 5 seconds
}
function chgImage() {
Cnt=++Cnt%ImgAry.length; // this just cycles 0,1,2,3,4,5,0,1,2,3,4,5,0.....
document.getElementById("Tst1").src=SRCary[Cnt].src;
}
//-->
</script>
```

Zachman Framework

Table 1. The Component of Zachman Framework Use in this Research

	Explanation	Reasons
Why	Goal list.Zachman Framework can be a framework that explained the goal list of a company.	Goal of the company, to make effective and efficient working. PT Rikola has a goal to make its consumers satisfied and be the better your agent in
How	Process diagram. Zachman Framework provide the process diagram for a company to be collect and use the information system	Make the process diagram of the diagram used. By Zachman Framework, PT Rikola can make process diagram more structured and comprehensive in collect information system.
What	Data model diagram.Zachman Framework prepare what a company need by make the prototype that company needed.	Data model allows the enterprise to make prototype to reach the goal. Through Zachman Framework, PT Rikola can make prototype to reach its goal.
Who	Organizational unit and role relationship model. Zachman Framework also provide the user or organizational unit and the role of relationship model.	For the importance of organizational goal. Through Zachman Framework, PT Rikola can prepare its user and the role in effective work.
Where	Locations diagram.Zachman Framework also state the location of the diagram and company.	Location of the company. PT Rikola is in Semarang.
When	Event diagram. Zachman Framework prepare when it used.	This time (year 2014). PT Rikola will implement Zachman Framework.

Validity and Reliability Testing

The result of validity testing is: From the table, the value of corrected item total correlation (r counted) is higher than r table (0.279) so it can be concluded that the data in this research is valid. The each mean of scale reflected the mean of each questions and scale variance reflected the variance of each questions. Meanwhile the corrected item total correlation reflected the correlation and cronbach alpha if item deleted reflected the value of alpha. From the table also

know that the cronbach alpha is higher than 0.5 so the data is reliable.

Hypothesis Testing

Hypothesis testing in this research use paired sample t-test. A paired sample t-test is used to determine whether there is a significant difference between the average values of the same measurement made under two different conditions.

Table 2. Hypothesis Testing (Customers)

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Low	Upper			
Pair 1 Cust_before - Cust_after	-1312000	873099	123475	-1560132	-1063868	-10626	49	0

From the table. 2. Above, the significant value is $0.000 < 0.05$ this means hypothesis accepted. This means there is differences between response before and after making the web commercial.

Table 3. Hypothesis Testing (Staff)

Paired Samples Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Low	Upper			
Pair 1 Staff_before - Staff_after	1686667	582932	150512	-2009484	-1363850	-11206	14	0

From the table.3. Above, the significant value is $0.000 < 0.05$ this means hypothesis accepted. This means there is differences between response before and after making the web commercial. And TAM score is 75% (average from after implementation website).

Conclusion and Recommendation

Conclusion

Based on the analysis and the result, so the conclusion in this research are:

1. Design of the commercial web for PT Rikola Tour and Travel is good implementation because there is significant difference between before implementation and after implementation
2. The analysis of Zachman Framework for Commercial Web reflected the best solution because describe the more comprehensive coverage for all enterprise architecture stakeholders.

Reference

1. Bobbit, L. M., & Dabholkar, P. A. 2001. Integrating attitudinal theories to understand and predict use of technology-based self-service: the internet as an illustration. *International Journal of Service and Industrial Management*, 12(5), 423- 450.
2. Davis, F. D. 1989. Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly*, 13(3), 319-339.
3. Gefen, D., Karahanna, E., & Straub, D. W. 2003. Trust and TAM in online shopping: an integrated model. *MIS Quarterly*, 27(1), 51-90.
4. Ghozali, I. 2006. *Multivariate Analysis Using SPSS*. Semarang: Undip.
5. Goldsmith, R. 2002. Explaining and predicting consumer intention to purchase over the Internet: an exploratory study. *Journal of Marketing*, 66(Spring), 22-28.
6. Grabner-Krauter, S., & Kaluscha, E. A. 2003. Empirical research in on-line trust: a review and critical assessment. *International Journal of Human- Computer Studies*, 58(6), 783-812.
7. Haque, A., Sadeghzadah, J., & Khatibi, A. 2006. Identifying potentiality online sales in Malaysia: a study on customer relationships online shopping. *Journal of Applied Business Research*, 22(4), 119.
8. Huang, E. 2008. Use and gratification in e-consumers. *Internet Research*, 18(4), 405-42
9. King, W. R., & He, J. 2006. A meta-analysis of the technology acceptance model. *Information and Management*, 43(6), 740-755.
10. Lin and Lu 2000. Exploring Chinese users' acceptance of instant messaging using the theory of planned behavior, the technology acceptance model, and the flow theory," *Computers in Human Behavior*, Vol.25, No.1: 29-39.
11. Park, S. Y. 2009. An Analysis of the Technology Acceptance Model in Understanding University Students' Behavioral Intention to Use e-Learning. *Educational Technology & Society*, 12 (3), 150-162.
12. Pereira, C.M., Pedro Sousa. 2004. A Method to Define an Enterprise Architecture using the Zachman Framework. *ACM 1- 58113-812-1/03/04*.
13. Schillewaert, N., Michael J. Ahearne Ruud T. Frambach Rudy K. Moe. 2000. *The Acceptance of Information Technology in the Sales Force*. eBusiness Research Center.
14. Venkatesh, Viswanath, David, Fred D. 2000. "A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies."
15. Zivran, M., Chanan Glezer, Itay Avni. 2005. "User satisfaction from commercial web sites: The effect of design and use." *Information & Management Journal*.