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# Implementation of Impact Zachman Framework on Internship Architecture Data Management

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**Abstract**—The quality of the internship activities can contribute to the participants as experiences it can be used as provisions for student self-development. The Good management consistency needs to be done by the school, so the implementation of the apprenticeship can run as well and provide valuable experience. Moreover, good management certainly requires careful and measured planning. The preparation of participants have to able to adjust the conditions of the internship before implementation needs to be considered, so the participants can adaptation with the new environment. The Architectural modeling have to be able on handling the apprenticeship management system on the create right model on solving problem. Through out the Framework test results applied to the apprenticeship data management model, the Zachman Framework which was applied in the development of the apprentice management system architecture model proved to be a positive solution for the implementation of the apprenticeship model. This is determined based on the results of user testing where 73.79% expressed satisfaction with the internship service that is the correlation value between the variable X to Y has a degree of closeness of 0.512 which has a strong meaning.

**Keywords**— *Framework Zachman, Internship Program, Data Architecture*

## I. INTRODUCTION

Data management model in a more informative form that is in the form of precise information, before processing the data it is necessary to collect the data needed so that the information produced is precise and relevant [1]. Data management systems that are timely, relevant and accurate to achieve the right information according to the objectives are very important to be implemented in various institutions to facilitate the management [2].

Institutions such as schools are institutions where social interaction occurs both interactions between students and interactions between institutions because it is the right information that needs to be done by the institution [3 One

of the activities undertaken by the vocational school in Indonesia which is industrial work practices or internships carried out in an industrial environment following the vocational courses taken by students at the origin of their school [4]. Processing data and information on relevant industry work practices is certainly very much needed to find the right place that is obtained quickly, efficiently and effectively. The architecture model in the integrated apprenticeship data management can be a solution to the problem that has been happening all this time, with an enterprise architecture that can accommodate the needs of the internship modeling business system process [5]. John Zachman 1987 is a tool that was developed to portray organizational architecture from various perspectives and aspects, so that an overall organizational picture is obtained in the apprenticeship management model[6].

## II. RELATED STUDIES

### A. Framework Zachman

Zachman Framework is an architectural framework that is widely known and used in the development of system modeling. The Zachman Framework was used by enterprise data architect experts in 1987 since Zachman first published the framework description article in the IBM System Journal that year.[23].

	Why	How	What	Who	Where	When
Contextual	Goal List	Process List	Material List	Organization Unit & Role List	Geographical Locations List	Event List
Conceptual	Goal Relationship	Process Model	Entity Relationship Model	Organizational Unit & Role Rel. Model	Locations Model	Event Model
Logical	Rules Diagram	Process Diagram	Data Model Diagram	Role relationship Diagram	Locations Diagram	Event Diagram
Physical	Rules Specification	Process Function Specification	Data Entity Specification	Role Specification	Location Specification	Event Specification
Detailed	Rules Details	Process Details	Data Details	Role Details	Location details	Event Details

Fig. 1. Framework Zachman

Zachman's first six perspective dimensions describe it in the following lines :

- **The Planner perspective ( Scope Context )**  
A list of the scope of explanation of business elements recognized by the strategists as the theorists who set objects in the discussion such as the background of the scope and objectives of the enterprise
- **The Owner Perspective ( Business Concept )**  
The semantic model of business connectivity between business components defined by the executive leadership as the owner, defines the shape of the product / business model
- **The Designer Perspective (System Logic)**  
More detailed logic models that contain the needs and design boundaries of the system are represented by architects as designers
- **The Builder Perspective (Technology Physics)**  
A physical model that optimizes design for specific needs within specific technological constraints, people, costs and timeframe specified by the engineer as the builder
- **The Implementer Perspective (Component Assemblies)**  
Specific technology, about how components are assembled and operated, is configured by the technician as the implementer
- **The Participant Perspective (Operation Classes)**  
System real-life events that are used by real people are used by technicians as participants.

Whereas in the second dimension, each perspective issue requires a different way to answer the fundamental questions: who, what, why, when, where, and how. Where every question requires answers in a different format. In this dimension, Zachman describes each fundamental question in the form of a column/focus.

1. **What (data column)**  
Material used to build the system (inventory set)
2. **How (function column)**  
Carry out activities (process transformations)
3. **Where (network column)**  
Location, topography and technology (network nodes).
4. **Who (person column)**  
Rules and organization
5. **When (time column)**  
Events, cycles, schedule (time periods)
6. **Why (destination column)**  
Purpose, motivation and initiative (motivation reason)

## B. Related Research

- Application of the Zachman Framework to the Architecture of Operational Data Management (Case study of SBU Aircraft Services, PT. Dirgantara Indonesia) [25]. It is stated that this Zachman Framework in the case of SBU data management faces problems in executing various applications that are not integrated. With various constraints and conditions, it must continue to improve business performance and interact with its partners and consumers. With this framework applied, it is focused on the perspective of enterprise-scale data and is applied to operational data management. From the results of modeling the data architecture using the framework approach, it can provide significant input for management to prepare for data integration in the future. From this research, there is a similarity of the framework, namely (Zachman Framework which was first published by John Zachman) while in the difference lies in the problem object, namely in the study the problem studied is the management of operational data in a company, while in the research to be a careful writer is the management student data.
- Analysis and design of information systems for new student admission and payment of SPP using the Zachman Framework [26]. stated that the research can produce and design information systems that can process data at the time of new student admission and payment of spp, and can be used as a foundation for developing the school system so that data can be integrated, and improve performance to perform task completion services well. It is known that in this study there are similarities of research from student data, then there are differences in this study only apprenticeship data.
- Modeling the architecture of academic information systems in high school and Bosko Semarang with the Zachman framework [27]. It is said that the Zachman framework produces a blueprint (blueprint) that can model academic information systems in a good, structured, and integrated manner. In this study, the academic information system process while in the research will only be done internship data from registration, implementation, to reporting internships.

## III. RESEARCH METHOD

### A. Data Analysis

To calculate the magnitude of the degree of relationship between variables, the author uses Rho Spearman (rs). To calculate Rho Spearman, each variable must be ranked first from the smallest to the largest. The general form of Rho Spearman is as follows according to (Bambang S.Soedibjo 2005 : 154) .

To find out how much the contribution or role of variable X to variable Y, the determinant coefficient is used, with the following formula:

$$KD = r^2 \times 100\%$$

KD = Koefisien determinasi

r = Koefisien korelasi

**Problem Analysis Method** In this study, enterprise architecture is analyzed using the Zachman Framework with the perspective of Planner (Scope), Owner (Business Model), Designer (System Model), and Builder (Technology Model). The relationship between the Framework and enterprise architecture is a Framework can be used to determine whether an enterprise architecture methodology includes all aspects of an enterprise architecture or what aspects can be fulfilled by an enterprise architecture methodology. Data and information obtained from observations, interviews, and questionnaires are analyzed and then poured into a two-dimensional matrix of the Zachman framework to obtain an overview of the

system to be built according to the needs of enterprise architecture, to achieve the enterprise.

### B. Instrumentation

In facilitating the research and to be more focused on the goals and objectives of the study, the variables used in this study are the independent variables (independent variables) as the X variable is the Zachman Framework Architecture Model and the dependent variables (dependent variables) as the Y variable is the Data Management System Student.

TABLE I. OPERATIONAL RESEARCH VARIABLES

Variable	Definition	Perspective	Dimension	Quation	Item Number
Architecture Zachman Framework base on web (X)	Zachman framework is a framework or framework created by John Zachman that was created to obtain a broad enterprise architecture	Planner	1. Data 2. Function 3. Network 4. People 5. Time	a. Application mechanism rules	1
				b. Important program in the field of study	2
				c. Class 2 students become the main priority in carrying out an internship	3
				d. Meet the needs in contributing to the world of work	4
				e. An internship program is implemented at the beginning of the year	5
Student data management system (Y)		Owner	1. Data 2. Function 3. Network 4. People 5. Time	a. Information system services that are automated with information technology	6
				b. System that can help complete the job properly	7
				c. Procedure that explains the flow of services in apprenticeship activities	8
				d. Data Input System	9
				e. Ability to adapt to services	10
		Designer	1. Data 2. Function 3. Network 4. People 5. Time	a. User friendly management	11
				b. Field curriculum that performs data input	12
				c. Relevant industry information	13
				d. Training process	14
				e. Journal Book	15
		Builder	1. Data 2. Function 3. Network 4. People 5. Time	a. Data services are held by the committee	16
				b. Deadline for report preparation	17
				c. Needs Designing	18

				d. Implementing schedule	19
				e. Actual management	20

IV. RESULT AND DISCUSSION

A. Evaluate the questionnaire

Evaluate the results of the questionnaire test regarding the data management system of internship students with the Zachman framework.

Classification of respondents			
	Category	amount	total
Gender	Male	30	60
	Female	30	
Status	Educational staff	5	60
	Educational non staff	5	
	Student	50	

The questionnaire method used is a closed method, in which respondents are asked to answer questions and answer by choosing from several alternatives given. The calculation of the score of each respondent uses a Likert scale that is the answer given a score of 1 (one) is the same as strongly disagreeing up to the number 5 (five) means strongly agree. From the questionnaire filled out by respondents, will be processed on the SPSS application version 21.0 and performed a frequency test on the user's answer.

TABLE III. TEST SAMPLE FREQUENCY OF USER ANSWERS (X...)

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Disagree	1	1,7	1,7	1,7
Doubtful	2	3,3	3,3	5,0
agree	25	41,7	41,7	46,7
Strongly agree	32	53,3	53,3	100,0
Total	60	100,0	100,0	

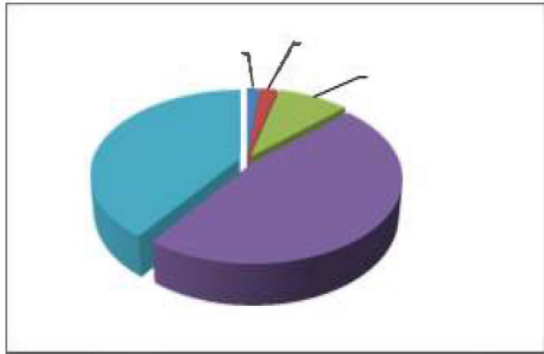


Fig. 2. Recapitulation of Respondents For Variable X

From the recapitulation of respondents' answers the highest answer 47% of respondents answered agree, 9% of respondents answered doubtfully, and 40% of respondents

answered strongly agree, 2% of respondents answered disagree and 2% of respondents. While those who answered strongly disagreed. Most respondents answered agreeing to

87% of respondents answered agreeing from (47% of respondents agree + 40% of respondents strongly agree))

that the pattern of developing Zachman framework using Web access that is applied to making the apprentice student data system has a very good impact.

TABLE IV. SAMPLE FREQUENCY OF USER ANSWERS (Y ...)  
BUILDER / TECHNOLOGY MODEL

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Not satisfied	1	3,3	3,3	3,3
Doubtful	7	11,7	11,7	15,0
Agree	36	60,0	60,0	75,0
Strongly Agree	15	25,0	25,0	100,0
Total	60	100,0	100,0	

On the page, students can apply for an internship From the frequency table for the variable Y with 6 indicators namely regarding the function of student data management system Internship to users who are involved in the system. A total of 60 respondents representing school students were given a questionnaire, and this data became data that would be input in data processing using SPSS version 21.0, the following is a recapitulation of respondents' answers, more clearly found in the figure.

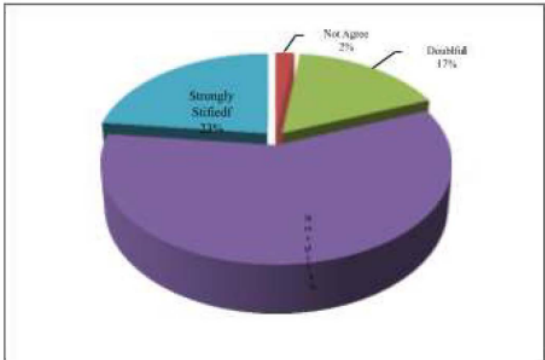


Fig. 3. Recapitulation Of Respondents For Variable Y

From the recapitulation of respondents' answers, the highest answer 58% of respondents answered satisfied and 23% of respondents answered, the total overall respondents answered satisfied by 81% of (58% of respondents answered satisfied + 23% of respondents answered very satisfied) that the apprenticeship student data management system applied quite well it was illustrated by respondents

who answered 23% were very satisfied with the service system of apprenticeship student data management. While some respondents answered doubtfully by 17%, respondents answered dissatisfied 2%, meaning that the student data management system applied in there was still a lack of information systems that needed to be developed to answer all user needs.

### B. Measure the correlation

Measure the correlation of the degree of relationship between Variables X and Y of the questionnaire on student data management with the web-based Zachman Framework

			Framework Zachman	Intership Data Manajemem
Spearman's rho	Framework Zachman	Correlation Coefficient	1.000	.512
		Sig. (2-tailed)	.	.000
Intrenship Program		N	60	60
	Intrenship Program	Correlation Coefficient	.512	1.000
		Sig. (2-tailed)	.000	.
		N	60	60

TABEL V. ANALISIS KORELASI

Based on the results of the analysis with the Spearman's rho test as in the table above, it can be seen that the correlation value between the Zachman Framework (Variable X) implemented in the Student Data Management System (Variable Y) obtained a correlation coefficient of  $r = 0.512$ , this value is between the values 0.51 - 0.75, which means the level of strength of the relationship (correlation) is strong enough, the correlation coefficient value is positive = 0.512 so that the relationship between the two variables is one-way (the type of unidirectional relationship), meaning that if the application of the Zachman Framework with the Web implemented in the Internship Data Management System the better it will have a good impact on the Internship Data Management System. The contribution of Variable X to Y can be seen based on the coefficient of determination (Kd) as follows:

$$Kd = r^2 \times 100\%$$

$$Kd = (0.512)^2 \times 100\%$$

$$Kd = 26.21\%$$

The coefficient of determination (Kd) shows the amount of contribution from the variable (X), namely the Zachman Framework Architecture Model with the Web implemented in the Internship Data Management System (Y) of 26.21% while the remaining 73.79% is influenced by other variables outside Zachman Framework architecture variables.

### B. Matrik Zachman

TABLE VI. ZACHMAN METRIX INTERNSHIP

	Data	Process	Network Local	People	Time
Contextual/scope	Student data, data of students who took part in internships, company data	Intrenship Activity	Admin	Head of Department, Administration, Advisor	Input report students who are follow the intrnship activities presence, report card grades, follow process training
Conceptual/business proses	Uml usecase diagram	A description of the process that occurred	Network Location	List of units people internal or which is related	Time schedule Developments System
Logical/system model	class diagram	Activiy diagram	The design network proposal	people Assigned For development	Schedule details System model design
Physical/technology model	Relasi table	Sequenc diagram	Desain Network	interface aplikasi	Schedule details System model design



Fig. 4. Implementation of Use Case Modeling

### V. CONCLUSIONS

In applying to the system with the Zachman Framework, it must describe in detail the columns and rows in the Zachman matrix so that the system can be fully depicted from various points of view. The filling of each cell must be consistent with various points of view, because if it is not

consistent then the Zachman framework will produce a normal view of an organization. Apprenticeship data management model with the Zachman Framework using web access makes the level of user satisfaction increase with a percentage of 81% of respondents said they were satisfied (58% of respondents answered satisfied + 23% of respondents answered very satisfied) this was obtained from the questionnaire answers distributed by the author to students and school teachers who use the data management system for street students, based on the correlation analysis of the Zachman Framework model implemented in the apprenticeship management system with a correlation value of 0.512 this value is in the range 0.51 - 0.75 meaning that the degree of closeness of the correlation coefficient is strong enough this means that if the application of the Zachman framework is implemented in the apprenticeship data management system the better it will have a good impact on the apprenticeship data management system at the school's institution. Contributions made from the correlation value based on the coefficient of determination of 26.21% are influenced by the other variables.

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