DESIGNING MOBILE-BASED APPLICATION FOR QUANTIFYING IT BUSINESS VALUE

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Abstract

North Sulawesi province is fostering regional development towards a society which have values, prosperous and competitive cultures. Information Technology (IT) have become a key enabler to accelerate region developments. To optimize IT utilization, local government can used *IT Valuation Matrix* framework, to identify all IT Business Value which derived from each IT investing type, and then be quantify in reasonable and responsible manner. *IT Valuation Matrix* framework also provide best practices to assessing local government IT investment**.** This article shows the process of designing mobile-android based applications for quantifying IT Business Value based on IT Valuation Matrix method. Using Disciplined Agile Delivery methodology, which based on agility and object-oriented approach, the application that meet user expectations and needs, can be developed.

Keyword : *IT Business Value, Application, Agile, DAD, Software Development*

Abstrak

Provinsi Sulawesi Utara mendorong pembangunan daerah menuju masyarakat yang memiliki nilai-nilai, makmur dan budaya kompetitif. Teknologi Informasi (TI) telah menjadi kunci untuk mempercepat perkembangan wilayah. Untuk mengoptimalkan pemanfaatan IT, pemerintah daerah dapat digunakan *IT Valuation Matrix*, untuk mengidentifikasi semua IT Bisnis Nilai yang berasal dari masing-masing jenis investasi IT, dan kemudian mengukur secara wajar dan bertanggung jawab. *IT Valuation Matrix* juga menyediakan praktik terbaik untuk menilai investasi TI pemerintah daerah. Artikel ini menunjukkan proses merancang aplikasi berbasis mobile android untuk mengukur Nilai IT Bisnis berdasarkan Metode dari masing-masing jenis investasi IT, dan kemudian mengukur secara wajar dan bertanggung jawab. *IT Valuation Matrix*. Menggunakan Disiplin metodologi Agile yang didasarkan pada *agility* dan pendekatan berorientasi objek, sehingga aplikasi yang memenuhi harapan pengguna dan kebutuhan, dapat dikembangkan.

Kata kunci: IT Nilai Bisnis, Aplikasi, Agile, DAD, Software Development

1. Introduction

The business realization benefits of IT (or *IT business value*) [1][2][3] defined as benefits or results obtained from an IT investment which can improve organization performance. IT business value is more than just provide a *benefit* in financially terms. The IT business value concept includes on how IT provides efficiency, effectiveness, increase productivity and create competitive advantage for a particular organization. This IT business value understanding follows Parker [4][5], where according to Bannister and Remenyi [6] based on Porter[7] definition about *value*. This article will follow IT business value definition proposed by Ranti [1][2].

The objective of this article is to demonstrate the analysis and design process of the application for Quantifying IT Business Value based on Ranti's IT Valuation Matrix Method. This application was developed using agile-approach methodology, called Disciplined Agile Delivery (or DAD).

2. Methodology

IT Investment Analysis

IT investment analysis, according to Ranti [2][3] was done based on several reasons, namely: To have a justification of IT projects, to enable organization assessing investment of various IT projects undertaken with limited resources, to provides a tools for controlling and monitoring IT investments that have been and will be done, and to enable organization create competitive advantage, develop new business, improve performance and productivity, and provide new ways for managing the organization. Ranti [1] develop an IT Investment analysis method based on the business value of IT.

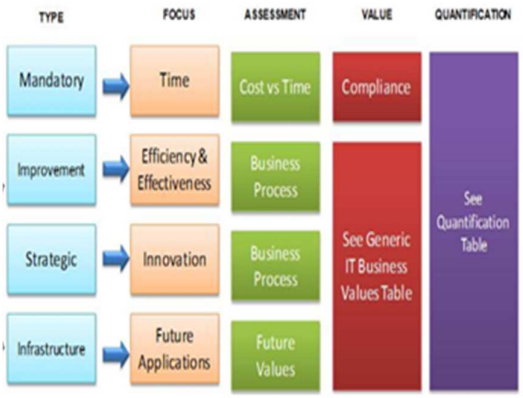

Figure 1. IT Valuation Matrix process method

This method is called *IT Valua-tion Matrix*. Ranti [1] also takes into account the financial and non financial approach. (See Figure 1). Ranti [1] framework begin with classifying the investment type according to the category of *mandatory*, *improvement*, *strategic* and *infrastructure*, where each category have different *focus*, *assessment*, *value*, and *quantification* process.

Wowor and Karouw [8] using Ranti's IT Valuation Matrix method to quantify the identified IT Business Value for Local Government. Using case study approach for North Sulawesi Province, as service-oriented organization, Wowor and Karouw [8] expand Ranti's IT Valuation Matrix me-thod with IT Business Value Identification and Classification phase, before Quantification stage. Wowor and Karouw [8] also added Clarification Process stage after conduct the Quantification sta-ge for all identified IT Business Value (see Table 1).

Disciplined Agile Delivery (DAD)

Disciplined Agile Delivery [9] developed by Scott Ambler [10]. As stated here [11], DAD is an enterprise-aware hybrid software process framework.

TABLE 1
CLARIFICATION PROCESS [8]

Category	Quantification Process	Clarification
Accelerating Process (APR)	(total completed tax notice x total working hours x total income) x time in month/years	The quantification amount mostly determine by working hours and type of service
Reducing Risks (RRI)	(total number of visiting tourists x visiting time (in days) x retribution cost) x percentage for Stakeholders sharing x time in month/years	The quantification amount mostly determined by number of taxpayer and how long taxpayers using the services

Formal definition for DAD is a people-first, learning-oriented hybrid agile approach to IT solution delivery. It has a risk-value lifecycle, is goal-driven and is enterprise aware. The DAD process framework is a hybrid: i.e it adopts and tailor strategies from a variety of sources [10]. See Figure 2 for The DAD Process Framework.

3. Results and Analysis

This article show the analysis and design process for build application for quantifying IT business value based on IT Valuation Matrix, proposed by Ranti [1]. Following stages conducted by Wowor and Karouw [8], this application will compute two category of identified IT business value, which are Reducing Cost of (RCO) and Reducing Risk (RRI). For this mobile android version, we have add new features such as Add New Project and Project List. The business process running by this application is shown at Figure 3 and Figure 4, using UML Activity Diagram.

Inception Phase

The main target of inception phase is to understand the scope and objectives of the project and obtain enough information to confirm that we must go on or no. Main result for this phase is User Requirements. User Requirements have major impact for application development. The artifact which produced user requirements list are called User Stories Card [12]. See Table 2 for User Requirements List, level of priority, feature that must be develop and application functionality.

Other artifact which have minor impact but important also is Software Project Plan document. This document show application estimation in terms of size, the number of developers required, working time and costs required. Using Function Point Analysis technique which explained by Pressman [13], the application estimation process will be compute easily. Table 3 summarized the result.

TABLE 2
USER REQUIREMENT LIST AND FEATURES

User	Feature
Developing a system which discern user privilege	Log In for User Verification
Developing a system that can provide comparison method	Select Method
Developing a system that provide clear user interface	Input Data
Developing a system that can display result clearly and easy to read.	Display Result
Developing a system to see the result in graphical manner	Display Result

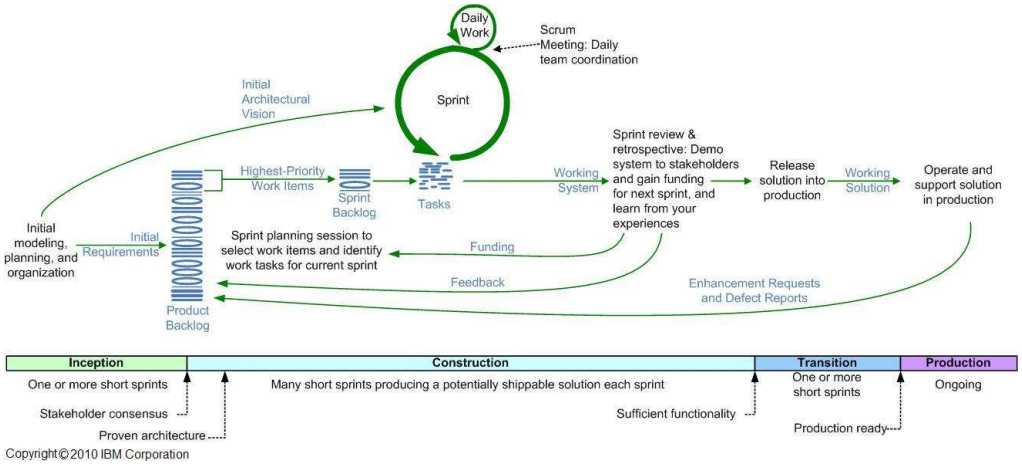

Figure 2. Figure 2. DAD Process Framework

TABLE 3
PART OF INCEPTION PHASE ARTIFACTS

Software Estimation	
Total Adjusted Function Point	152.29
Lines of Code (LOC)	67000
Effort (in person-months)	11.71
Estimate Time Required	7 months

Construction Phase

Construction phase is the next stage in the software development lifecycle according to DAD. The target of this phase is to determine the base architecture of the system and building working application code follows the base architecture. The major artifact resulted from this phase activities is Software Architecture Document (SAD). Mostly, SAD document provides the architecture model for the whole software application system. For this research, author using UML 2.0 [14] as tools for application models as Fowler proposed [15].

We used UML Use Case Diagram and Use Case Descriptions as functional requirements model. However, the complete list of UML Use Case Description are not presented in this paper. Figure 4 depicted UML Use Case Diagram as Functional View Model for this application. This use case model will guide through all construction process.

Interface design is the process of defining how the system interacts with an external unit. The user interface consists of three basic parts. The first is the navigation mechanism, a way of giving instructions to the user and the system tells the

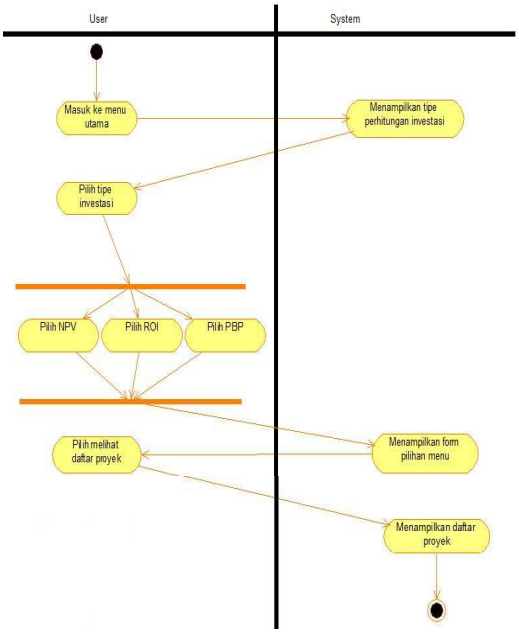

Figure 3. UML Activity Diagram for List Project

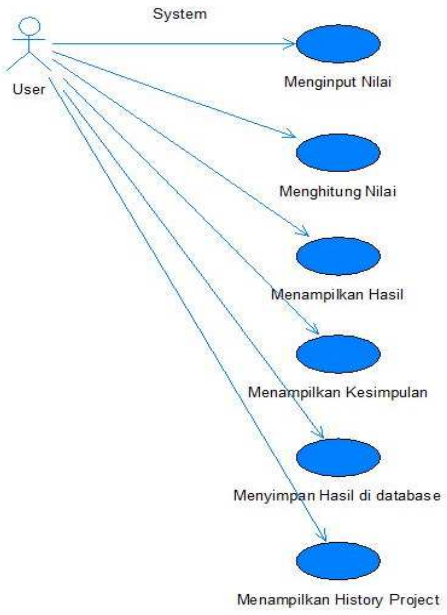

Figure 4. Use Case Diagram

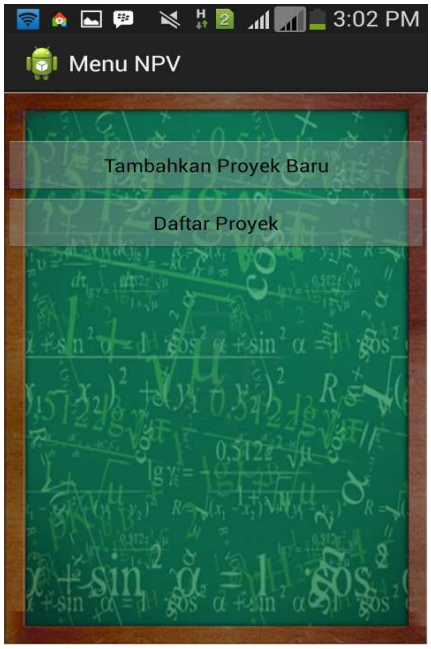

Figure 5. Feature Add New Project and List Project

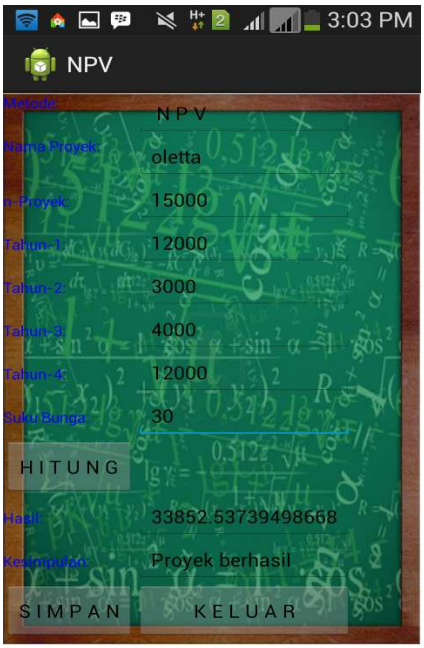

Figure 6. Report Page

system what to do, such as buttons and menus (see Figure 5). The second is the input mechanism, a way of capturing information system (e.g a form to add news). The third is the output mechanism of how the system provides information to users or to other systems (e.g reports, web pages). (see Figure 6).

Transition Phase

The main target of the construction phase is efficient and inexpensive development of the end product, that is, a version of the operational system that can be deployed to the end-user community. The designing and construction of this application is using Android Developer Tools version 22.3.4-8878.26 Android 4.0.

4. Conclusion

This paper show the analysis and design process to develop application for quantigying IT business value which follow IT Valuation Method proposed by Ranti [1]. As Wowor and Karouw [8] conduct, process for quantification and clarification can be done for category Reducing Cost Of (RCO) and Reducing Risk (RRI). Some conclusions from the writing of this paper include: 1) The DAD process framework can be used as guidelines to design mobile-based application for non-profit organization, such as local government. This process framework promote agile-approach and object-oriented paradigm, so can ensure software delivery faster; and 2) The Mobile version Application for Quantifying IT Business Value must be develop comprehensively for all identified IT Business Value proposed by Ranti's IS/IT Generic Business Value.

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