

IMPLEMENTATION OF USER ACCEPTANCE TEST (UAT) TO VALIDATE
FUNCTIONAL REQUIREMENT OF INTEGRATED COMPUTERIZED
BANKING SOLUTION (ICBS) MODULES

WAN ADIBAH HANIS BINTI WAN AZIZ

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ABSTRACT

In the Software Development Life Cycle (SDLC), the software product requires implementation of testing phases before the deployment of the product into the real environment. The software testing phases consist of unit testing, integration testing, system testing and user acceptance testing (UAT). Each of the testing phases is essential to ensure the software conforms to the requirements. The UAT is crucial phase of software testing activities. All the requirements will be validated and completely covered during this phase. Unfortunately, many neglect the importance of this phase and this causes failures after the deployment of the software product. Additionally the testers also face difficulties in adhere to software testing process. There are numerous reasons for this, including the difficulty in mastering the complexity of managing the entire test activities in software testing projects. In order to assist testers in managing the testing process effectively, Software Test Management Tool such as HP ALM is available to support organization of test artifacts i.e. test requirements, test cases and test results. In this project, there are four main objectives which are to ensure the quality of software product developed that is going to be delivered to customer. The second objective is to minimize defect and risk occurrences in software system. The third objective to generate a Software Test Report (STR) and last but not least is to improve UAT process by using software test management tool. Some of software deliverables have been used as references for this project which are Test Strategy, UAT Test Plan, and Test Case of Deposit module for ICBS and also a Defect Report. The outcome of this project will be a STR of Deposits module based on completion of test execution activity of Integrated Computerized Banking Solution (ICBS) modules in UAT cycle 1.1.

ABSTRAK

Dalam *Software Development Life Cycle* (SDLC), produk perisian memerlukan pelaksanaan fasa ujian sebelum penghantaran produk ke dalam persekitaran sebenar. Fasa-fasa pengujian perisian terdiri daripada *unit testing*, *integration testing*, *system testing* dan *user acceptance test* (UAT). Setiap satu daripada fasa ujian adalah penting untuk memastikan perisian sesuai dengan keperluan. UAT adalah fasa penting dalam aktiviti pengujian perisian. Semua keperluan akan disahkan sepenuhnya semasa fasa ini. Malangnya, ramai mengabaikan kepentingan fasa ini dan ini menyebabkan kegagalan selepas penggunaan produk perisian. Selain itu penguji juga menghadapi kesukaran untuk mematuhi proses pengujian perisian antaranya oleh kerana kesukaran dalam menguasai kerumitan mengurus sesuatu aktiviti ujian keseluruhan dalam projek-projek pengujian perisian. Dalam usaha untuk membantu penguji dalam menguruskan proses ujian dengan berkesan, *Software Test Management Tool* seperti HP ALM boleh didapati untuk menyokong pengurusan artifak ujian iaitu *test requirements*, *test cases* and *test results*. Dalam projek ini, terdapat empat objektif utama iaitu untuk mengkaji dan meneroka kualiti produk perisian yang dibangunkan yang akan dihantar kepada pelanggan. Objektif kedua adalah untuk mengurangkan kecacatan dan risiko kejadian dalam sistem perisian. Objektif ketiga untuk melaksanakan proses UAT dengan menggunakan *Software Test Management Tool* dan akhir sekali adalah untuk menjana *Software Test Result* (STR). Sebahagian daripada *software deliverables* telah digunakan sebagai rujukan untuk projek ini seperti *Test Strategy*, *UAT Test Plan*, dan *Test Case* modul Deposit untuk ICBS dan juga *Defect Report*. Projek ini akan menghasilkan satu STR bagi modul Deposit berdasarkan penyiapan aktiviti *test execution* bagi modul *Integrated Computerized Banking Solution* (ICBS) dalam UAT kitaran 1.1.

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LIST OF ABBREVIATIONS

AMLA	–	Anti-Money Laundering Act
ATM	–	Automate Teller Machine
BAU	–	Branch User
BDS	–	Branch Delivery System
BSN	–	Bank Simpanan Nasional
CIS	–	Customer Information System
DMVT	–	Data Migration Functional Testing
FAT	–	Final Acceptance Test
FTD	–	Fixed Term Deposit
HP ALM	–	Hewlett Packard Application Lifecycle Management
IT	–	Information Technology
ICBS	–	Integrated Computerized Banking Solution
JTM	–	Jabatan Teknologi Maklumat
SSP	–	Premium Saving Certificate
SDLC	–	Software Development Life Cycle
STR	–	Software Test Report
SME	–	Subject Matter Expert
SIT	–	System Integration Testing
UAT	–	User Acceptance Testing

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CHAPTER 1

PROJECT OVERVIEW

1.1 Company Background

BSN was consolidated on 1 December 1974 under the Minister of Finance around then, Tengku Razaleigh Hamzah. With its fuse, BSN has assumed control over every one of the obligations and duties of the Post Office Savings Bank. On 5TH December 1974, BSN was authoritatively dispatched by the Second Prime Minister of Malaysia, YAB Tun Haji Abdul Razak Bin Hussein,

"Bank Simpanan Nasional represents a new way in our efforts to instill thrift so that the people will be encouraged to save their money. It will maintain the high standards of the Post Office Savings Bank and at the same time bring several changes in keeping with present time. I hope that with the launching of Bank Simpanan Nasional today, it will develop as a major saving institution and will expand the savings campaign of the government an anti-inflationary move and quicken the pace of national development. Therefore, Bank Simpanan Nasional has an important role in the lives of the people and National Development." - YAB Tun Haji Abdul Razak Bin Hussein.

BSN's initiation on 5th December 1974 delineated 5 principle goals. These targets stay important until today as its center standards of its presence (BSN Annual Report, 2014) :

- i. To promote and mobilize savings, particularly from small savers
- ii. To inculcate the habit of thrift and saving.
- iii. To provide the means for savings by the general public.
- iv. To utilise the funds of the Bank for investment including financing of economic development of the nation.
- v. To uphold the interest of its depositors and other customers (BSN Annual Report, 2014)

Figure 1.1 below show the official logo of BSN:



Figure 1.1 BSN logo

The money tree image, which means development and riches, is held yet changed with a cutting edge realistic treatment. The quantity of coins on the tree has been expanded from 13 to 14 coins to show the majority of Malaysia's states and government domains. This demonstrates BSN serves each state and region and everybody in the country accessible to the bank's solutions. The "pohon pitis" (coin tree) image which frames the primary topic of the logo is an adjustment of the one made of tin metal bearing 13 coins issued by Sultan Muhammad IV of the State of Kelantan in 1903 when it was still a sub state of Siam. The coin or "pitis", which in Kelantanese lingo implies money, was one of the denominations available for use in Kelantan until 1920 (IAMM, 2005).

BSN's vision is "To be the national and preferred provider of comprehensive financial services for the Malaysian people" while its mission is "To improve the economic wellbeing and quality of life of Malaysians by encourage savings, investments and smart financial management among Malaysians to increase their quality of life by providing ready facilities for this purpose" (Copyright Bank Simpanan Nasional, 2010 – 2015). BSN has more than 6760 representatives, 399 branches and 621 automate teller machine (ATM) across the nation. BSN has more than 8 million clients spread all through the length and expansiveness of the nation and with reserve funds of more than RM 8 billion. BSN is consistently upgrading its administrations and in addition growing its products for the advantage of its clients. BSN's main products include Personal Financing, mortgage loans, Premium Saving Certificate (SSP), Islamic Banking Scheme, Giro Savings Account, BSN Matrix and Matrix-i Debit Card as well as VISA and Mastercard credit card (BSN Annual Report, 2013).

The Bank's Corporate Strategic Plan (CSP) gives BSN its vital business course. BSN's main goal is to successfully contend in the managing an account industry while undertaking ordered parts to give more prominent access to keeping money and budgetary education for all, especially those in the country ranges. In the course of recent years, BSN had changed itself as one of the remarkable development financial institutions (DFI) to contend amongst business banks. The execution of BSN's automated banking channels in the previous 5 years-Internet Banking (myBSN), SMS Banking (BSN:SMS), off-premise ATMs and Cash Deposit Machine (CDMs) had upgraded BSN's capacity to give better services to its clients. By 2015, the Bank will have set up another Core Banking framework to facilitate automate processes and reduce the time-to-market of its products. Upgrades in IT combined with the constant extension of its branch system will quicken the Bank's effort to more Malaysians both in the urban and remarkably in the provincial regions, in satisfying its order to provide banking services to all society. In accordance with the Government's yearnings, BSN had developed its Islamic Banking arm to address buyer issues and in the meantime bolster the Government in making Malaysia the center point for Islamic Banking (BSN Annual Report, 2012). BSN is completely dedicated to giving you the superb service and products that each Malaysian merits.

Our sanction announces that (BSN Annual Report, 2014) :

- i. The customer is always the priority.
- ii. A service that instills confidence and satisfies the customer.
- iii. Product/services that are of quality, efficient and consistent
- iv. Providing information that is timely, precise and complete

In 1986, BSN has set up its procedure to be one of the focused financial institutions in the nearby market by presenting few key items furthermore growing its business outlets. BSN speedy growth of its outlets resulting to an expansion of the branches up to almost 250 in year within 1987 to 1989. The broad business development of BSN makes IT base must be moved up to provide for the extension. BSN IT has experienced periods of development up to this point. BSN IT is known as Jabatan Teknologi Maklumat (JTM). JTM vision is to be the empowering agent for the accomplishment of the Banks business and key targets while the mission is to build up its human capital, procedures and innovation to guarantee constant services that is exclusive requirements, quick, productive, trusted, creative, and business centered (JTM, Copyright Bank Simpanan Nasional, 2010 – 2015).

1.2 Background of Project Involved and Importance to Company

In 2010, Department Core Banking under JTM BSN starts to work on new core banking system that expected to be deployed on 2017 (IBS Core Banking Systems Case Studies, 2013). This new Core Banking System called ICBS (Integrated Computerized Banking System) is supplied by BML Istisharat to supplant current banking system various legacy solutions including the ICBA core system from local software developer, Infopro (Tanya Andreasyan, IBS newsletter, 2013).

ICBS has been taken to cover several core operation modules which are Deposits, Payments, Branch Delivery System (BDS), Channels and Interface and Customer Information System (CIS). Currently, User Acceptance Test (UAT) cycle 1.1 is taking place to test all those core operation modules in ICBS. All core operation modules in ICBS is undergo software test process that is being manage by software test management tool called HP ALM (Application Lifecycle Management) tool.

UAT is frequently the last phase of the execution procedure which is directed to guarantee that system requirements address business issues. The UAT procedure takes into account any issues to be altered before the system goes live. UAT ought to be completed by the clients or business experts to figure out if the product fits their utilization or not (Merit Web, 2011). UAT lets you know how usable the system is. Great UAT testers are interested to see what happens if they trying to execute the test cases in different way and not following the specific path only. A key advantage of good UAT is that it reduces the cost of organization to fix any issues come out after the software is implemented in real world. It is less expensive if they cater any software issues appear during software development phase earlier in UAT. Feedback received from UAT is useful for software enhancement and it robustness (Lawrence Yarham, 2013).

However, this stage frequently gets cut off. Inability to do proper user acceptance testing can lead to bad consequences such as legal risk, missed due dates and increase cost. Appropriately done, user acceptance testing shields the association from an entire host of potential issues (Bugwolf Team, 2015). It's imperative to comprehend what goes into User Acceptance Testing. Making a test plan characterizes the extent of testing, who will direct the testing, and how the defects will be logged. Figure out any conceivable risk in the test plan. Keeping in mind the end goal to lead UAT, you should know the business necessities by working closely with the responsible important stakeholders and end-clients. Test cases can be developed properly after obtain the business requirement from them (Jake Bartlett, 2015).

UAT is conducted with the aim of creating certainty of the user in the software product. As systems become increasingly complex and a more prominent number of business basic process are being computerized, UAT has turned out to be more than a simple testing once development is complete. UAT concentrates on ensuring that requirements are being implemented and that the software actually meets the requirement demand by user. Numerous organizations are as yet figuring out how to enhance and refine their UAT process and with the right software and tools, it should be possible a great deal more effectively and at a much lower cost and guarantee quality of software product (Colin Robertson, 2014). This project will particularly focus on UAT implementation in software testing phase and process and its importance to organization that conduct a software testing project.

1.3 Project Objective

The following objectives are set to be achieved in this research:

- i. To study and explore the quality of software product developed that is going to be delivered to customer.
- ii. To minimize defect and risk occurrences in software system by implementation of User Acceptance Testing (UAT) activities.
- iii. To implement User Acceptance Testing (UAT) process by using instrumentation.
- iv. To prepare software test report (STR) to analyze the software test execution status.

Thus, the main question in this research is:

Is the implementation of UAT in software testing phase is importance to organization that conduct software testing process.

1.4 Project Goal

To accomplish the above objectives this project will conduct several activities and provides some deliverable based on the activities performed as shows in the table 1.1 below:

Table 1.1 : Activities and deliverables

Activities	Deliverables
Implement UAT activity	Test documentation (test plan, test strategy, test case) under study based on modules (deposits) provided by organization
Defects tracking on UAT cycle 1.1	Lists of defects and defects status- Defect Report
Documentation of test execution result	Software Test Report (STR)
Applying HPALM as an instrument in managing test cases during UAT	HPALM generated report

1.5 Project Scope

Scopes for any research and project is very important as it can limit the area of research to a specific field and ensure that the research or project to focus on the defined limitations. So, the scope for this research is as the following:

- i. This project will use HPALM as a tools assists in conducting UAT.
- ii. Software Test Report (STR) will be produced at the end of UAT.
- iii. Lists of defects found will be generated.

- iv. Report generated by HPALM (defects, test execution, daily execution report)

This project only focuses on deposits module of ICBS.

1.6 Report Outline

This project is organized into 5 chapters. Chapter 1 will be on the project overview regarding brief company background which includes also background of project involved and importance to company, project objective, project scope, project goal and significance. In the following chapter 2, the literature review related to this project area will be provided. It will provided study done by previous researcher regarding the UAT, the phases and its importance to software development process. This chapter will also highlight different issues and challenges and also points relevant to software testing and software test management. Further, justification over the importance of User Acceptance Testing in software testing process phase will also be presented. In chapter 3, project methodology used in this project will be presented. It will discuss on the test methodology approaches used in this study, preparation of the test data use by this project, test environment available for test execution process, tool used in aiding the software testing activities, phases involved in UAT implementation and also project framework consists of objectives and activities with deliverables of this project. Chapter 4 will describes about the implementation and design of this project. It will clearly explain about the implementation of UAT activities starting from test strategy, test planning, test execution, defect management and test closure. It also provides several step by step figures on how the testing activities occur by help of the HP ALM software test management tool. Finally, the last chapter 5 will provide a brief summary throughout the whole thesis from the beginning of Chapter 1 until Chapter 5 according to project objectives and achievements.

1.7 Project Plan (Gantt Chart)

TASK	MONTH												
	JUNE	JULAI	AUGUST	SEPTEMBER	OCT	NOV	DEC						
Topic selection	█												
Writing proposal		█											
Proposal submission		█											
Thesis Writing			█	█	█	█	█	█	█	█	█	█	█
Project Overview			█	█	█	█	█	█	█	█	█	█	█
Project background study			█	█	█	█	█	█	█	█	█	█	█
Progress Report				█	█	█	█	█	█	█	█	█	█
Literature study				█	█	█	█	█	█	█	█	█	█
Progress Report						█	█	█	█	█	█	█	█
Experimental setup						█	█	█	█	█	█	█	█
Progress Report							█	█	█	█	█	█	█
Thesis submission 1								█	█	█	█	█	█
Presentation 1									█	█	█	█	█
Data Collection										█	█	█	█
Data analysis											█	█	█
Progress Report												█	█
Final thesis submission													█
Final Presentation 2													█

Figure 1.2 Project plan (Gantt Chart)

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