

Discussion about the Project Particularly Aims at Technology Acceptance Model of Cloud Monitoring System

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Abstract. Cloud computing time is coming, lots of government organizations, schools, and companies are using different kinds of cloud service. Although there are many cloud computing scholars, they rarely discuss cloud management. The basis of the study is TAM model which researched on Cloud service provider instead of End users. Using a totally new method that particularly aims at Technology Acceptance Model of Cloud Monitoring System to discuss the service of Cloud Management System. The result of the study suggests: even the DevOps engineers also hope that ease of use and usefulness are main demand which accept Cloud Management System.

Keywords: TAM model, Cloud service, Cloud Monitoring System

1. Introduction

With the constant innovation and improvement of cloud service, end users is more and more likely to acknowledge the benefit of it, which also forces cloud service provider to keep launching the cloud service and expanding computer's software and hardware. Therefore, how to manage the cloud service becomes a major topic that naturally falls on the shoulders of engineers who are responsible for developing software and maintaining hardware. But so far, there has been very limited research about the management of the cloud service, even those very professional engineers themselves have no idea how to continuously expand the cloud service and information equipment under effective management.

This research being carried out now is based on TAM, which has the development and maintenance engineer as project manager and adopts the way of importing project mode into the cloud monitoring system seeing if it is acceptable. The result showed that Perceived Ease of Use in the cloud put positive impact on the Perceived Usefulness and Adoption Attitude and Perceived Usefulness put positive impact on Guidance Will. What's more, Perceived Usefulness can indirectly influence the Guidance Will through Adoption Attitude. Suggestions according to the research outcome: start the import of the project of the cloud monitoring system for the sake of meeting the demand of the cloud service management. The first thing to do is to take the simple and easy use as priority, the second is to meet all kinds of monitoring demands, then the project can be push forward and be accepted, finally be put into practice.

2. BACKGROUND

2.1. Cloud Service[1]

On August 9, 2006, Eric Emerson Schmidt, CEO of Google, put forward the concept of Cloud Computing for the first time on SES San Jose 2006. On September, 2011, the National Institute of Standards and Technology, NIST has given clear definition of having three service modes of it: Software as a Service, SaaS; Platform as a Service, PaaS; and Infrastructure as a Service, IaaS. Therewith, more and more cloud services come from behind, such as, Network as a Service, NaaS; Storage as a Service, STaaS; Security as a

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Service, SECaaS; Database as a Service, DaaS; Communications, content and computing as a Service, CaaS; IDentity as a Service, IDaaS; Backup as a Service, BaaS; Desktop as a Service, DaaS; Monitoring as a Service, MaaS; Anything as a Service, XaaS and so on.

2.2. Cloud Monitoring System[2]

The cloud monitoring system is an important tool for software procedure and hardware, the demand analysis of imported project should be discussed from four directions: Monitoring Categories, Monitoring Pains, Tools, and Alert Mediums.

- Monitoring Categories goes like this from simple to complicate: Traditional service monitoring, Tenant health monitoring, Expose this monitoring to tenants, Provide monitoring as a service for tenants[3].
- Tools include commercial software and freeware; the famous freeware are: Cacti, Nagios, Zabbix, Zenoss, etc. OpenNMS that is most suitable for the cloud monitoring system is adopted in the research[4].
- Monitoring pains is divided into monitoring pains and chronic widespread pain. Trigger point pain refers to the disconnection of a certain network or the damage of a hardware or a shutdown of a computer..., those problems can be solved through traditional computer room management mode. In fact, the issues from the cloud environment all are chronic widespread pain, which means the end users always complain the ineffectiveness of the cloud service while it is hard to figure out what's wrong with the issues? Something like chronic widespread pain will keeping adding because of the expansion of the cloud service.
- Alert Mediums can be selective to adopt Email, SMS, Email to SMS, VoIP and so on.

2.3. TAM Model[5]

The technology acceptance model (TAM) is an information systems theory that models how users come to accept and use a technology. The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it, notably:

- Perceived usefulness (PU) - This was defined by Fred Davis as "the degree to which a person believes that using a particular system would enhance his or her job performance".
- Perceived ease-of-use (PEOU) - Davis defined this as "the degree to which a person believes that using a particular system would be free from effort" (Davis 1989). Fig. 1 depicts the Technology Acceptance Model.

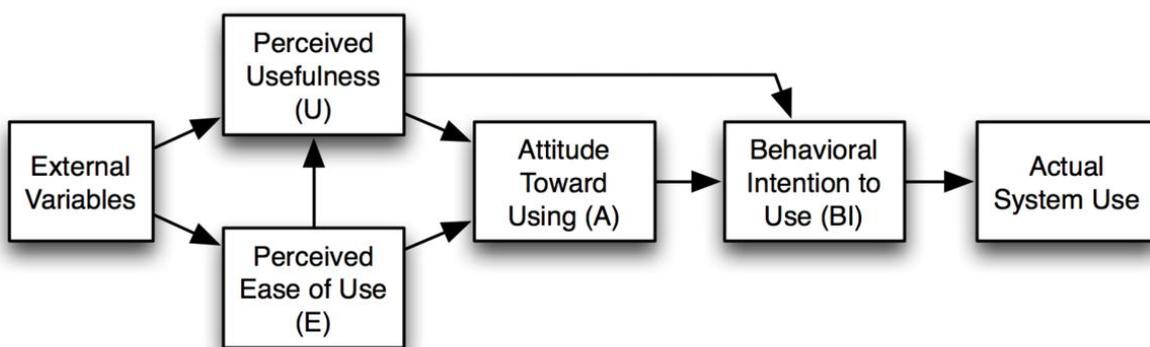


Fig. 1: Technology Acceptance Model

Form: Davis, Fred D., Bagozzi, Richard P. and Warshaw, Paul R. (1989) User acceptance of computer technology: a comparison of two theoretical models. *Management Science*. 35(8), p.985.

2.4. Project Management[6]

According to the definition of Project Management Institute, Inc.: A project is temporary[7] in that it has a defined beginning and end in time, and therefore defined scope and resources. And a project is unique in that it is not a routine operation, but a specific set of operations designed to accomplish a singular goal.

So a project team often includes people who don't usually work together - sometimes from different organizations and across multiple geographies. And all must be expertly managed to deliver the on-time, on-budget results, learning and integration that organizations need. Project management, then, is the application of knowledge, skills, tools, and techniques to project activities to meet the project requirements.

Project management processes fall into five groups: (1) Initiating, (2) Planning, (3) Executing, (4) Monitoring and Controlling, (5) Closing, as below Fig. 2



Fig. 2: The five processes in the life cycle of the Project
 From https://en.wikipedia.org/wiki/Project_management

A project manager is the person responsible for leading a project from its inception to execution. This includes planning, execution and managing the people, resources and scope of the project. Project managers must have the discipline to create clear and attainable objectives and to see them through to successful completion. The project manager has full responsibility and authority to complete the assigned project.

3. Project Import

This research takes the cloud service provider as the case research object and in order to accord with the research content, the case provider has to follow the below principles: (1) Import the cloud monitoring system in the need of the nature of business to improve existing condition. (2) The case provider is willing to work together to import the project and willing to offer relative information and do satisfaction survey. (3) Appoint experiential development and maintenance engineers as the project manager to carry out the project. (4) Have budget for compile project.

After some visits and consultation, there are two providers that is well-known for years is suitable for the research. The cloud information equipment is to expand or add gradually instead of being replaced by new-purchased ones, so the hardware is used both on old and new equipment, the software is combined with various different program language and different data base, turning it into the cloud service.

This research divides the project import into five stages[8]: (1) Initiation. (2) Planning and Design. (3) Executing. (4) Monitoring and Controlling. (5) Closing. Details as following:

3.1. Initiation

- The selection of project manager: assign professional development engineers to the case, because they master the skills and experience in developing and maintaining software and hardware and are insightful and capable to solve conflicts.
- Demand survey: all the demands came from the survey cannot be met through traditional monitoring system, which is a huge test for the success of the research.
- Feasibility study: discuss if the demand proposed by project team is feasible? If not, then amend the demand. By the end of finishing the project, all demands have to be finished.
- The management focus at the stage of beginning: (1) Scope: because of the limitation of the resource and budget from providers, the cloud monitoring system scope has clear definition and recognition from the top of providers and is consistent with the research purpose. (2) Period: the period of the

project is one season (three months). (3) Quality: the cloud monitoring system has to have problems solved that the traditional monitoring system cannot do. (4) Budget: tools use freeware that has helped save over 90% expenditure compared with commercial software and without the purpose of profit, so the fund is not a problem.

3.2. Planning and Design

- Write planning: the two providers actually have traditional monitoring system, what troubled them is the ineffectiveness of the complicated cloud service. Therefore, project managers make a list of functions that the traditional system lacks.
- Management focus at the stage of planning: (1) Scope: plan monitoring categories which contains traditional service monitoring, tenant health monitoring, expose this monitoring to tenants and provide monitoring as a service for tenants, which have covered all cloud projects. (2) Period: schedule for software installation, system setting, efficiency correctness, etc. (3) Key path: the path of the project should be set by system, because the cloud service combines the old and new software and hardware. If the system really cannot set correctly, then remedy it with other freeware, such as Nagios NRPE Plugin.

3.3. Executing

- Every project and sub-project has four limitations: performance, cost, time, scope, and PCTS. In addition, the cloud monitoring system is a brand-new technology, so it is inevitable to have some problems, if the problems cannot be get over, then change the plan should be considered.
- Management focus at the stage of execution: (1) Milestone of the project process has to get finished within the preset time and budget. (2) Expenditure for the project has to be controlled within the budget, no extra budget is allowed.

3.4. Monitoring and Controlling

- The true essence of project monitoring and controlling is the self-control which every attended member can do. In the project, many set values have to be added on the network equipment, operation system and database and need to adjust a lot, which depends on the cooperation of every member.
- Management focus at the stage of monitoring and controlling: (1) The purpose of the cloud monitoring is to dig out potential problems. (2) Don't use much more complicated technique to solve problems. (3) Before getting close to the end of the project, simplify the project, so that the subsequent maintenance work can go on smoothly.

3.5. Closing

- Internal assessment after finishing the project: hold an assessment meeting that has main topics: (1) Problem solving; (2) Technique transformation; (3) Promotion of future new monitoring project.
- Management focus at the stage of finishing project: view the effectiveness of the imported project, and the project team has (1) been transformed from passively receiving abnormal information to actively analyzing cloud service effectiveness. (2) Make sure to learn useful experience as a reference to the future project import.

After finishing the project, the two providers in the case will have a satisfaction survey testing that is to be measure by Likert 5 points. The main research variables include Perceived Usefulness, Perceived Ease of Use, Adoption Attitude, Adoption Will and Import Will. Controlling variables contain industry difference, whether go public, total assets, service experience.

4. Case Study

Researchers do research to TAM in which many research objects are end users, which are transferred to enterprises in this import case study, discussing the intention of enterprises to accept new information system. Because the information system differs from average electronic software, so it has to be viewed by the way of importing project.

TAM mode claims that the external factors will have impact on users' personal beliefs, comparatively, it will also have on enterprises' beliefs. The reason to choose the two providers as our object, not only because they constantly launch new cloud service, but also their hardware like network equipment and server are mixed with old ones and the new ones. Besides, programming language and database exist the same way, so there caused insufficiency in management, which is hopefully to be fixed by new-imported information system, that is to say the cloud monitoring system.

With the mode of project import, the enterprises' use condition of information system is viewed by satisfaction survey, finding that Perceived Ease of Use in the cloud put positive impact on the Perceived Usefulness and Adoption Attitude and Perceived Usefulness put positive impact on Guidance Will. What's more, Perceived Usefulness can indirectly influence the Guidance Will through Adoption Attitude. So the research case and TAM mode is identical in terms of applying on end users.

5. Results

Advises professional development engineers also hope to practically operate the cloud monitoring system in simple and easy ways, so as to meet the function demand. System developed by very complicated programming has more function settings, which is not necessary to be accepted and loved.

6. References

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