



## Development of Strategic Planning to Success (STRAPS) System for UiTMCTKKT

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### ABSTRACT

In this new era of technology, it is crucial for a professional organization such as Universiti Teknologi Mara Cawangan Terengganu Kampus Kuala Terengganu (UiTMCTKKT), which in needs of managing yearly strategic planning, to have a reliable Management Information System (MIS) in order to work efficiently. Currently, there is no specific system used for the university to manage the yearly strategic planning and tracking its progress for reporting purposes. Hence, derived a problem where there is a lack of documents sharing and sorting system as currently the staffs only communicate and sharing the documents through the communication applications such as WhatsApp and Telegram. Furthermore, Ketua Pusat Pengajian (KPP) also needs to continually remind the staffs to make progress on the strategic planning before the deadline through the communication applications. In response to the problems, a Strategic Planning to Success (STRAPS) system is developed, where it is an online web-based system that incorporates the Plan-Do-Check-Act (PDCA) technique, as well as, the cloud computing theory. This theory and technique will be implemented as a concept for the development of the system. Additionally, a System Development Life Cycle (SDLC) Waterfall Model is used as a suggested method to guide the whole process of the development of the STRAPS system. Besides that, a system testing plan and evaluation from the thirty (30) respondents and two (2) experts also are carried out as a method to improve the functionality, usability and interface design of the system. The result of the testing, which is performed in an environment that closely resembles the production environment, is then being discussed in this paper to provide more reliable and efficient outcomes. It is an essential phase as it means that the system is well accepted and meets the specifications of the users and ready to go live.

**Key words** : Plan-Do-Check-Act (PDCA), strategic planning, Strategic Planning to Success system, STRAPS.

### 1. INTRODUCTION

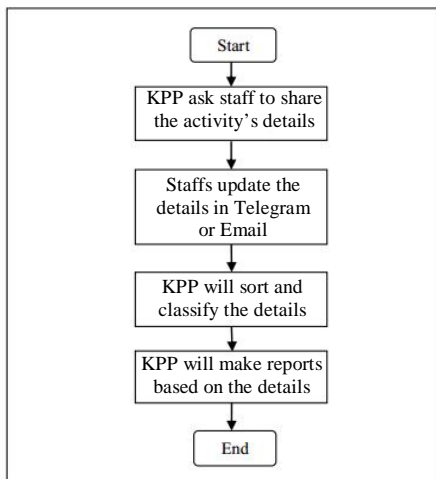
Over the decades, strategic planning has become one of the most challenging things and had been exercised by most of the institutions. This strategic planning allows the institutions to make necessary decisions by efficiently integrate long-term objectives with short-term actions through administrative coordination [1]. Besides, the strategic planning system is just a structured process that is built on a thorough analysis, organizes and coordinates of the institution's existing activities, report, data and resources. However, UiTMCTKKT does not have any administrative coordination and formality of the process, which can assess the yearly strategic planning. On top of that, reports, data and information relating to the decision making and follow up actions for the strategic planning are shared and collected either manually or by online gathering through communication applications such as Telegram. As a result, aroused concern about there is no specific system that can anticipate the results of their planning efforts.

Consequently, a Strategic Planning to Success (STRAPS) system is being proposed where it is implemented the Plan-Do-Check-Act (PDCA) and cloud computing theories to ease the sharing of the reports, data and information between the staffs of UiTMCTKKT. Although the radical new technological developments had caused the rise of many different frameworks and methodologies for the strategic planning system, there are often lacks the means for explicating the details, differ in size and diversity of operations, as well as, too complicated to be assigned in the UiTMCTKKT environment.

The PDCA is an iterative four-step approach that is a simple but powerful framework for continuous improvement and gives a positive impact on productivity and efficiency of the strategic planning [2]. Meanwhile, cloud computing is basically about delivering services from applications to the storage and processing power over the internet for fast and flexible accessibility. Therefore, with the development of the proposed system, the problems can be solved and fixed efficiently and thus, stimulates the continuous improvement of the strategic planning process.

### 1.1 Problems & Business Process

As mentioned in [3], strategic planning involves a process that has inputs, activities, outputs and outcomes. However, the strategic planning process in UiTMCKKT does not follow these four (4) approaches. The current strategic planning of UiTMCKKT is depicted in Figure 1, in which, currently, the KPP will ask the staffs to share the activity details such as program name, venue, date and others. The staffs will then update the details of the activities through mediums like Telegram and Email.



**Figure 1:** Current Process of UiTMCKKT Strategic Planning

Based on the figure above, after receiving the details, the KPP will manually sort and classify the details. Then, the details will be used by the KPP to make a report for documentation purpose. If there are insufficient data, the KPP will need to ask the staff through the communication application to share more information again. Eventually, the KPP will generate a report based on the collected data manually.

As mentioned before, the strategic planning should have inputs, activities, outputs and outcomes. In the case of UiTMCKKT, there are no inputs gathered to understand the values, opportunities and risks of the activities planned. Therefore, the staffs sometimes execute activities that have no direction and target in strategic planning. Furthermore, all of the information about the activities that have been planned is shared in the Telegram or email which makes it difficult for the KPP to classify and categorize it and sometimes KPP needs to remind the staffs to update the activities' details. On the other hands, for the output of the process, all of the documentation is carried out manually by KPP which sometimes it has become a complex process as all the folders and subfolders that have been shared are not labelled correctly and does not describe the content well. For the outcomes, currently, there is no clear documentation that describes the outcomes generated from the activities executed. Thus, derived problems in lacking assessment and measurement of the activity and cannot determine how close it is to the strategic goals or whether it is a success or failure of the strategic plan. Thus, if there are no outcomes that can be generated, all of the activities conducted might become pointless and waste of the institution's resources.

### 1.2 Project Objectives

This study is conducted to achieve the following objectives:

1. To identify business process and current process of planning, execute and sharing of result or activities details and report among lecturers in UiTMCKKT.
2. To design and develop Strategic Planning to Success (STRAPS) system for UiTMCKKT that uses the Plan-Do-Check-Action (PDCA) theory and cloud storage theory.
3. To evaluate the functionality and usability of the proposed system.

### 1.3 Target Users

There will be four (4) target users of the system, which are Administrator, Ketua Pusat Pengajian (KPP), the person-in-charge (PIC) and lecturers. The administrator is the only person who can register new staffs that includes KPP, PIC and lecturers. The main reason why the other user except administrator cannot do registration by themselves is to control users of the system and make sure the users are within the boundary. Next, KPP is the person who will use the STRAPS to set the strategic planning and target for that particular year and collect the details of activities for reporting purposes. PIC is responsible for creating a list of initiatives to ensure that the strategic planning and the target goals that have been set by the KPP can be achieved. The PIC will also use the STRAPS to validate outcomes and help to classify the activity report under the right category of strategic planning. The last user is the lecturer where the lecturer will use the system to upload and share the activity plan and report in order to achieve strategic planning.

## 2. RELATED WORD

The literature review will depict all about the critical concepts, research methods, and experimental techniques that are used in the proposed system. The purpose of a literature review is to gain an understanding of the existing research and debates relevant to a particular topic or area of study and to present that knowledge in the form of a written report [4]. Thus, this paper literature review will discuss on the Plan-Do-Check-Act (PDCA) and cloud-based theories implementation.

### 2.1 Plan-Do-Check-Act (PDCA) Theory Implementation

The Plan-Do-Check-Act is an iterative four-step model that is used for continuous improvement of processes and management areas, as well as, the key element of Lean Management. It is implemented to standardize the information and reduce the errors that will directly influence the decision making in strategic planning [3]. The implementation of PDCA should be repeated in a never-ending cycle of plan, do, check and act steps. Mentioned by [5], repetition of the cycle can bring the plan and activities conducted closer to the goals, and thus, lead to

achieving the perfect operation for the inputs, activities, outputs and outcomes. Figure 2 below illustrates the PDCA model that will be implemented in this proposed system.

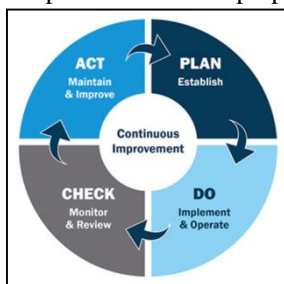


Figure 2: PDCA model

Based on the figure above, the cycle starts with the Plan step. In this step, it involves the analysis and establishment of objectives, plan of activities and processes necessary to deliver the results and expected outcomes. All of the analysis data in this step need to be documented with the clarity on the person that should be responsible for each of the activities, the measurement method used to assess the outcomes, and expected timelines [5]. Next is the Do step where all of the plans at the previous stage are carried out in this phase. At the next phase, that is Check, all of the outcomes and results of the plan and activities that are already achieved need to be verified. It would be best to assess the outcomes and results based on whether it achieves the original goals or not before proceed to the other phase. Without following-up the results, it would be impossible to determine the corrective actions, the process capabilities and improvements [6].

The last step is an Act, where the corrective solutions are taken place. In this phase, the potential faults and the difference between the activities and plans towards the goals are being analyzed to determine the causes. This step is crucial as it will determine where the improvement should take place and whether the objectives are met or not. However, the process of this cycle is not just a one-time event. This means that the process is a loop where all of the steps need to be carried out all over again in which the improved version of the process becomes the new baseline for the future one.

In the proposed system, the PDCA theory is applied based on Table 1 below.

Table 1: PDCA Theory Applied on the Proposed System

PDCA Step	Features	Description
Plan	Update strategic plan	KPP start the process by updates the strategic plan that includes add, edit, and delete of the plan, set the start and end date, and set the PIC.
	Update strategic plan initiatives	PIC updates the initiatives that include add, edit, and delete the initiatives.
Do	Upload of document and report	Lecturers can upload the related document and report of the activities.
	Check and validate the	PIC does the checking and validating process whether the documents uploaded are

	documents	accepted or not.
Check	Sort documents into categories	PIC sorts the document with the right categories.
	Track the progress	Progress of the strategic plan can be check by all the users.
Act	Notify the staff	PIC notifies the lecturers if the progress is overdue or close to the due date.

## 2.2 Cloud-Based Theory Implementation

Cloud computing is the storage and accessibility of data and programs over the internet, as well as, synchronizing the data with other information over the Web instead of using the device’s hard drive [6]. The cloud computing service covers a vast range of options, which include the basics of storage, processing power, networking, artificial intelligence, as well as the standard office applications. This method gives significant benefits to the institutions as it pushes the boundaries of all the underlying technologies and architectures, where it is cost-efficient, flexibility, fast in speed and can give integration of all the applications and devices [7].

The cloud computing service have six (6) major layered framework [12] and broadly divided into three categories that are Software-as-a-Service (SaaS), Platform-as-a-Service (PaaS), and Infrastructure-as-a-Service (IaaS). Software-as-a-Service (SaaS) is a software application delivery over the internet through web services or networks and can be accessed by various users [8]. Hence, users can access SaaS applications from any location using their own devices that have internet access. Good examples of SaaS are Google Mail, Salesforce.com, Google Docs, and so forth. Platform-as-a-Service (PaaS), on the other hand, is the underlying of development tools and software for the developers to develop applications while providing cloud components to the software or the development tools such as storage, virtual servers and networking. The difference between PaaS and SaaS is that PaaS offers a development platform for the completed and in-progress cloud applications, while SaaS only provided completed cloud applications that can be readily used [9]. Examples of PaaS services are Google AppEngine, AWS Elastic Beanstalk, Salesforce’s Force.com, and so forth.

Lastly, the Infrastructure-as-a-Service (IaaS) is referred to the IT infrastructures such as physical or virtual servers, storage and networking that are provided and can be rented in the IaaS cloud. Compared to the SaaS and PaaS, IaaS offers the users full control over all the elements in the IT infrastructure and they can build the applications from the very ground up. However, it required a high technical skill to be able to orchestrate all of the services at all levels [10].

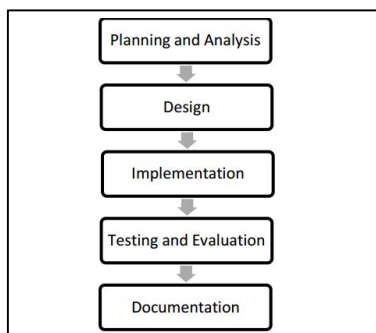
In the proposed system, the cloud computing chosen is SaaS cloud computing, which the architecture of the proposed system is shown in Figure 3 below.



**Figure 3:** Cloud Computing (SaaS) Architecture for STRAPS

### 3. METHODOLOGY

The methodology can be defined as an early phase in the development of a system, which includes a collection of procedures, techniques, tools and documentation requirement. A suitable methodology is indeed needed to guide the developers at various stages in the project. Thus, the methodology chosen for the STRAPS system development is an Adapted Waterfall Model. As can be seen in Figure 3, the Adapted Waterfall Model that have been implemented consists of five phases, which are planning and analysis, design, implementation, testing and evaluation and documentation.



**Figure 3:** The Adapted Waterfall Model

The initial phase of the STRAPS system development is the planning and analysis phase. During the planning and analysis phase, an interview session is conducted to collect as much as possible data that can be gained from the interviewers. Current business process in the form of the flowchart is derived from the analysis of the information gained from the survey and interview session. Besides, after analyzing the current business process, several problems are presented in the form of problem statement metric. A detailed literature review is conducted to enhance information and widen knowledge regarding the area of interest in the development project.

The second phase of the project framework for STRAPS is the design phase, where the collected requirements gained from the previous phase are transformed into the design model. This design phase includes the process flow diagrams, the context diagram, the data flow diagram (DFD), the entity-relationship diagram (ERD), the functional hierarchy diagram (FHD), and the interface of Strategic Planning to Success (STRAPS) system. This phase also includes the

PDCA and cloud computing theory in the designing of the proposed system. The third phase of this methodology is the implementation phase. The process of system implementation is based on the design that has been done in the previous phase. Moreover, the development process for the STRAPS system is supported by hardware and software that are required to ensure proper system functionality and completed tasks.

Project testing and evaluation are included in the methodology phase, as the phase is crucial to evaluate the STRAPS system functionality and usability. The testing and evaluation are done with the thirty (30) respondents and two (2) experts. The evaluation with the experts is based on the open-ended questionnaires, whereas the evaluation for the respondents is based on the closed-ended questionnaires with the given scale 1 to 5 (Strongly Disagree=1, Disagree=2, Natural=3, Agree=4, and Strongly Agree=5).

Documentation is the last phase in the project framework where all information and report that is related to the project is recorded or documented. There might be changes happening in the system functionality, usability and system and user requirement. Thus, the purpose of the documentation is to ensure that all information about the system is recorded and stored correctly so that if any changes are meant to be made in the system, it will be a reference for the developer. Furthermore, it is also crucial and essential to record all the data in each phase in order to ensure all important details are not left out and to help the developer to identify any possible problem to avoid major rework.

### 4. RESULT AND DISCUSSION

This section focused on the result and discussion of the STRAPS system, which is related to the system testing, expert testing and user evaluation. The tests are based on the functionality of the graphical user interface (GUI) to ensure that the process flow of each component and sections of the system are deliverable and according to the specification. For the expert testing, there are six (6) distinctive criteria of the proposed system that have been evaluated, which are the user interface, the satisfaction towards the system, the consistency, the perceived usefulness, the ease of use, and the efficiency of the system. Overall, the experts are very satisfied with all of the features that the STRAPS system provided. However, they give a few comments and suggestions for the system improvement regarding the user interface. They said that the system's interface needs to be simple for the users to navigate and use the system easily.

Besides, they recommended that the system needs to have a search option and filter option for the specific strategic plan, PIC or the lecturers. They also added that the system needs to have a drop-down button to add the PIC for each of the strategic plan added to the system.

On the other hand, for the evaluation carried out by the thirty (30) respondents, there are six (6) criteria need to be tested

that are perceived usefulness, perceived ease of use, efficiency, consistency, user interface and satisfaction. All of the respondents fall into a group of 18 – 28 years old, sixteen (16) females (53.3%) and fourteen (14) males (46.7%), and the majority of them are in Bachelor Degree of Computer Science program. Therefore, the analysis of all of the six (6) criteria shows that the highest mean for perceived usefulness is 4.00, perceived ease of use is 3.93, the efficiency is 3.97, consistency is 4.03, the user interface is 4.03 and satisfaction is 4.10. Overall, the highest means for all construct are the satisfaction towards the system with the highest mean of 4.10, which the respondents agreed that they are satisfied with the system because the system is useful, clearly understandable, and pleasant to use. Figure 4 below summarizes the analysis result for all of the respondents.

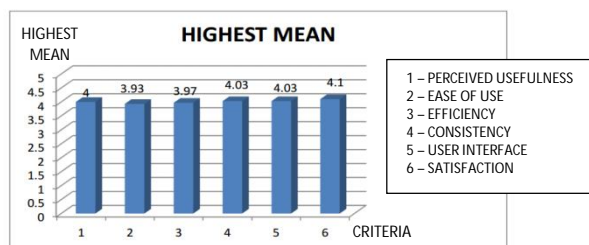


Figure 4: Overall Summarize of the Highest Mean

## 5. CONCLUSION

The STRAPS system is an online system that is developed for UiTMCKKT that currently manage the strategic planning manually. By having this system, the strategic planning can be achieved within the allocated time without having issues on file management, misdirection of activities and inefficient of the sharing of reports or documents.

During the implementation of STRAPS system, there are several problems limitations occurred. The first problem is the documents or reports that are uploaded to the system cannot be edited online and hence, the users need to download and edit it remotely in their devices before uploading it back to the system. The second problem is this STRAPS system is tested only using the user's laptop and computer without testing it in other different devices such as tablet and smartphone because of inadequate time allocation for the testing process. For the theory implemented that is cloud computing, this paper only focused on Software-as-a-Service (SaaS). The PDCA cycle theory used in this paper also instils commitments from the lecturers for the continuous improvement and improvement of the efficiency and productivity in a controlled way.

Clearly, several recommendations can be made to the proposed system. Firstly, the developer needs to provide a cloud platform where the users can easily and simultaneously edit the uploaded documents or reports. Additionally, the proposed system also needs to be available and tested for other devices for the convenience of the user, as well as, integration with Knowledge Management (KM) which [11] stated that it can improve the knowledge and information

sharing in the strategic planning of UiTMCKKT. In future research, it is suggested that the system can be implemented using all of the three (3) cloud computing approaches instead of using Software-as-a-Service (SaaS) only. It is also suggested that the system can be developed in mobile-based services with the hybrid mobile application in the cloud.

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