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Role of Change Management in the Successful Roll-Out of IT Projects: A Case Study of Higher Learning Institutes in Malaysia

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Abstract: **Change is inevitable. This is especially true in our modern society where change occurs more rapidly than before. Change management has now become a critical part of any organization. Organizations that were world leaders five or six years ago are nowhere to be seen because they failed to adopt to change. However, adopting change is not an easy task and involves a multitude of factors that must be considered before any change takes place. Fortunately, there are a lot of models/methodologies available that cater to the needs of change within an organization. This paper reviews four popular change management methodologies for the context of this study, i.e., role of change management in the successful roll out of IT projects at Malaysian Institutes of Higher Learning (IHLs). This paper also considers the objectives of the Malaysian Education Blueprint (MEB) proposed by the Ministry of Higher Education. This paper finally suggests a change management methodology that is best suited for implementing required changes related to IT projects at IHLs.**

Keywords: **roll out of IT projects at Malaysian Institutes, Institutes of Higher Learning (IHLs).**

I. INTRODUCTION

Change is inevitable. Change is something that happens all the time. When the winter season arrives, people start changing the way they dress by wearing warm clothes to adapt to the freezing temperatures outside. Some people may welcome this change of season and thus willingly adapt to the change it brings in their behavior whereas others may not like this change of season but nevertheless have to adapt to it in order to survive. However, in the context of an organization, approaching an imminent change in a structured way is just as important as adapting to change itself. Without proper planning and structure, the execution of a change within an organization can become chaotic and lead to disaster. This is where change management comes in.

Change management refers to the processes, tools and techniques to manage the people side of business change to achieve the most successful business outcome [1]. According to [2], the essence of change management is to create a change-friendly context for all change processes. There are many change management methodologies out there that can be implemented by an organization to manage the process of change. However before implementing a particular methodology it is critical to determine the nature of the change itself. An organization needs to ask questions like: What is the scale of the change? Does it affect the whole organization or a particular department or branch? What kind of impact could it potentially have towards the organization? According to [3], there are six key factors associated with successful change classification. These factors can be used to determine and evaluate the nature of a change that is to be made in an organization. After we have successfully classified the nature of the change that is to be made, only then can we move on to choosing an appropriate change methodology.

This paper focuses on the role of change management in the successful roll out of IT projects at various institutes of higher learning (IHL) in Malaysia. This paper will discuss the background of such institutions in terms of adopting change management specifically with IT projects, the problem statement, and the methodology to be used in order to evaluate the role of change management in the successful roll out of IT projects at institutes of higher learning in Malaysia.

II. BACKGROUND

The IHLs in Malaysia are governed by the Ministry of Higher Education (MOHE). The MOHE is responsible for maintaining education standards across all public and private institutes of higher learning in Malaysia. The use of Information and Communication Technologies (ICTs) has now become the lifeline of all major IHLs and its use is also encouraged by the MOHE. The Malaysian government has proposed a blueprint for enhancing its education system called the Malaysian Education Blueprint (MEB), which was launched in 2013. In relation to the use of Information Technology (IT), the blueprint aims to enhance online learning at Malaysian IHLs and set up Massive Open Online Courses (MOOC).

Many IT Projects have been developed for use within IHLs such as Student Information Systems, e-Learning Systems, Library Systems and others. Many such systems are continuously being upgraded by individual IHLs to meet international standards and to have a competitive edge over other IHLs. The main reason behind introducing new systems or upgrading legacy systems which we can see as introducing change is to increase the productivity and sustainability of the organization and to stay relevant in today's dynamically changing world. It is critical for IHLs to ensure that when a new system is introduced or a legacy system upgraded, that proper change management tools and techniques are used to ensure a smooth transition to the new or upgraded system. Without proper change management, the organization, in this case the IHLs, risk failure of adoption of the new system by its people which will in turn mean a failed IT project and the loss of a competitive edge over other IHLs.

According to [4], change management is much demanded since it focuses on the enhancement of the projects after being implemented to cope with the current massive change aspect to ensure the productivity and sustainability of organizations.

The following section discusses the issues faced by IHLs with regards to implementing change management after an IT project has been implemented and it discusses some unique constraints that IHLs have to consider before implementing change management tools and techniques. It also discusses some of the key aspects of the MEB 2015-2025 that relate to use of IT at IHLs.

III. PROBLEM STATEMENT

Educational institutions like other organizations are out to make a profit at the end of the day and thus they have to deal with similar issues of budget management and managing their fiscal year. This has been alluded to in [5]. This is even more so with IHLs due to there being more money to manage and take care of such as grants and scholarships. Change management is an expertise like many others and does come at a price justly so. This section will deal with the problems IHLs face with change management. IHLs tend to operate differently from conventional organizations due to the aforementioned reason and the variability of the different amount of importance given to the business part of things depending on whether the IHL is in the public or private sector. IHLs in the public sector, i.e. those that are supported by ministries or the government in general mainly believed that Project Management Office (PMO) value was of the greatest concern whereas IHLs in the private sector believed that business was of the greatest concern [5]. Keeping this in mind, it becomes clear that problems of this kind require either to specify the scope to the different sectors or to perform exhaustive research so as to discover patterns.

IT projects in IHLs tend to affect a large amount of people due to the organizational structure. IHLs tend to double as research centers as well, which involves systems for the management and retrieval of documents along with information retrieval and communications. No IHLs are without a library, research material retrieval systems, internet connection solutions and other systems relating to lectures and tuition fees. One of the main problems of an environment which does not have stable variables is the act of balancing management techniques in order to meet the organizations expectations. The last paragraph discussed the difference in emphasis placed on certain values.

The Malaysian government has proposed a blueprint for enhancing its education system. This paper will focus on the blueprint from a higher education perspective, mainly the MEB 2015-2025 (Higher Education)[6]. The blueprint focuses on the key areas where the Malaysian education system can be improved to meet the needs of the nation. This paper will focus on the aspects related to IT projects, either directly or indirectly, of the blueprint and will be highlighted in the following paragraphs.

The blueprint discusses ten (10) shifts which would be needed in order for the government to reach its aims of a better, more encompassing education system. The focus of this paper are the first and ninth shifts, namely: (a) Holistic, Entrepreneurial and Balanced Graduates and (b) Globalized Online Learning. The first part is concerned with the

mismatch between the expectations of employers and the delivery of university graduates with regards to the requisite knowledge, skills and attitudes. This mismatch is expected by the government to increase and its closure to become more difficult due to "technological disruptions" that will "reshape industries and alter the types of jobs available"[6]. This involves a change, both in education programs and student perspectives so as to at least decrease the mismatch if not eradicate it completely.

The second relevant aspect is the government's plan for "Globalized Online Learning". The government wishes to take advantage of the relatively high Internet penetration (67%) to setup the Malaysian education brand by setting up Massive Open Online Courses (MOOC) which would "enhance the quality of teaching and learning, lower the cost of delivery, and bring Malaysian expertise to the global community"[6]. This would involve a change in preparation of teaching materials, method of transferring knowledge, and possibly an adaption of the HLI revenue model to accommodate all the other changes this aspect will bring about.

As can be seen, there is a great amount of change that will occur on a large scale and thus it is incumbent to validate the proposed changes. The changes will be made by each IHL at an individual level to meet the objectives set by the MEB. In this paper, we will be focusing on how to manage changes relating to IT projects that are mandated by the MEB and also changes relating to IT Projects in general at IHLs. These changes should be managed by a change management model and this paper will discuss the pros and cons of several models and propose the most suitable model to implement the change that will occur.

IV. LITERATURE REVIEW

There are a lot of models available that can be used to manage change. Discussing all of them is beyond the scope of this paper. We will discuss four models for change that are most widely used by organizations to manage change. The models that we are going to discuss here include: The ADKAR Model, The 4Ds Model, The Kurt Lewin Change Management Model and Kotter's Eight Step Change Model.

A. The ADKAR Model:

This change management model was introduced by Jeff Hiatt in 1999. ADKAR is an acronym for Awareness, Desire, Knowledge, Ability and Reinforcement. These five terms make up the five elements or the building blocks of the ADKAR model. The ADKAR model is sort of a waterfall model where an element of the model can only be implemented after the element preceding it has. For example, the Desire element can only be implemented after the Awareness element has been implemented. So the order of execution for each element in the model follows the acronym of the model. According to [7], ADKAR is an individual change management model, i.e. it represents the essential elements of change for a single person. However, the model can be extended to a group of individuals as well.

The first element of the ADKAR model is Awareness. This basically refers to understanding why change is required, the type of change being proposed, and the associated risks if the required change is ignored. So a general awareness about why a change is needed has to be raised among all parties that will be affected by the proposed change. There are a number of factors that influence the awareness of the need for change. [7] lists them as follows:

1. A person's view of the current state.
2. How a person perceives problems.
3. Credibility of the sender.
4. Circulation of misinformation or rumors.
5. Contestability of the reasons for change.

The second element of the ADKAR model is Desire. This refers to an individual making the personal choice of whether he/she will support and participate in the implementation of the proposed change after realizing the reasons behind the proposed change (Awareness). The factors that will influence this decision of either supporting or resisting the change are listed by [7]:

1. The nature of the change and what an individual has to gain from it.
2. How individuals perceive the organization and their surroundings that are undergoing change.
3. The personal situation of an individual.

The third element of the ADKAR model is Knowledge. Once the "Awareness" of the need for change is understood and the "Desire" to support the change is expressed by an individual, the Knowledge element must be implemented. According to [7], the Knowledge element refers to training and education on the skills and behaviors needed to change, detailed information on how to use new processes, systems and tools and understanding of the new roles and responsibilities associated with the change.

The fourth element of the ADKAR model is Ability. This is the step where the new acquired knowledge for change from step 3 (Knowledge) is actually demonstrated. In other words, the change is now implemented practically and is not theoretical anymore. The change is now visible and can therefore be measured. [7] lists the factors that influence the ability of an individual to implement change:

1. Psychological Blocks.
2. Physical Abilities.
3. Intellectual Capability.
4. The time available to develop the needed skills.
5. The availability of resources to support the development of new abilities.

The final element of the ADKAR model is Reinforcement. This refers to the process of ensuring that the change that has been made is maintained by an individual and by the organization at large. Essentially, it is about making sure that the change that was implemented now becomes the status quo. The factors that influence the effectiveness of reinforcements are listed by [7]:

1. The degree to which the reinforcement is meaningful to the person impacted by change.
2. The association of the reinforcement with actual demonstrated progress or accomplishment.
3. The absence of negative consequences.
4. Accountability systems to reinforce the change.

The ADKAR model is one of the most popularly used model for change. However, it is not without its share of issues. According to [8], the ADKAR model overlooks the role of leadership in driving change. Also, the ADKAR model is useful for a focused change in a specific area and might not be feasible for a large scale change as it focuses on individuals.

In the context of IHLs in Malaysia, when it comes to the introduction of new IT projects or systems the change is usually a more general one, like a new e-learning system that affects almost everyone. The individuals that are most affected by it are the students as they are most likely to be the target users of such IT projects. In managing the change or transition to the new or upgraded system, someone needs to step up as a leader to help to drive the change as well as help students adopt the new system. This role can be taken up by the Students' Representative Council that exists as a student body in every IHL in Malaysia. Since the Council is comprised of students themselves, they can easily appeal to all the students as to why the new system is needed or should be adopted. Thus, they will be able to cater to the emotional side that needs addressing when a change is made. This feature is also absent in the ADKAR model.

B. The 4Ds Model:

This model was introduced by [1]. The 4Ds represent the following four phases: Diagnose, Design, Develop and Deliver. The *diagnose* phase involves conducting an evaluation of performance against pre-defined benchmarks. This evaluation may be conducted in a specific area such as a specific business process, a specific system functionality or it may cover a wider area. The result of this analysis basically gives an overview of what is working, what is not working, which areas can be improved and what is missing. This helps outline the general or specific problems within an organization.

The purpose of the *diagnose* phase is to confirm or create a shared view about the future: vision, strategic objectives, scope of the change and how much resistance the change is likely to encounter [1].

The *design* phase is basically about generating ideas and possible solutions to the problems identified in the *diagnose* phase. This is an exhaustive phase where every possible solution is considered before designing the final solution. This is done by conducting multiple workshops with key stakeholders and subject matter experts.

Workshops are conducted in the form of Conference Room Pilots (CRPs). Each CRP is conducted within a gap of a certain number of weeks which allows the design to be built upon from the previous CRP.

The purpose of the *design* phase is to identify all possible avenues of improvement, focusing on one business process at a time and the identification of a preferred solution or future state model [1]. Therefore, at the end of the *design* phase, the organization will have a formal set of change milestones and deliverables that are to be achieved and a conceptual idea of how the organization will function after the change is implemented, i.e., the future state model.

The *develop* phase involves developing the solution in detail based on the outcomes of the design phase. The solution is developed in a manner that addresses the needs of the foundation of any organization: people, processes and technology.

According to [1], the *develop* phase is when the detailed change plan is produced, following final scope and cost-benefit decision making. It is also when the implementation and transition plans are put together, supported by a communications plan and when change networks and stakeholders are mobilized and toolkits are developed and deployed to ensure the organization is ready to take on the change.

This phase is usually concluded by testing the solution. In the IT context, this would include unit testing, black and white box testing, alpha testing and finally, user acceptance testing. In the business context, the change would be tested using simulations.

The *deliver* phase involves the deployment of the developed solution into the organization. Here, the previously mentioned implementation and transition plans are utilized. These plans describe the process of deploying the change/solution in terms of 'how' and 'when'. When this phase is concluded, the change starts becoming the new norm.

As soon as the change becomes operational, the focus must now be on sustaining the change. According to [1], change can be sustained by using 4 levers to reinforce the change and encourage the required change in behaviour:

1. Process Reinforcement: Examples include performance appraisal, personal development, skills development, job descriptions, career progression and merit/performance related pay.

2. Motivators: Examples include role models, reward and recognition, incentives, responsibilities and penalties.

3. Systematic Compliance: Examples include team targets, customer surveys, information sharing, resolution handling and return on investment.

4. Operational Support: Examples include process ownership, coaching, self-service information, helpdesk support and super users/trainers.

The 4Ds model is a comprehensive change management model that can be applied to a specific or a wider area when the need of change is realized. The model also provides elements like change leadership development and emotional support that are lacking in the ADKAR model. The 4Ds model thus seems to be a more appropriate change management model that can be tested and applied in the context of IT projects at IHLs in Malaysia because the area of change is usually wide and it usually impacts a large population, i.e. students. Plus, the 4Ds model also provides an eight lens framework (The Change Prism), which can be used to measure the success of a change after it has been implemented.

C. Kurt Lewin's Change model:

Kurt Lewin's change management model is analogous to the process of freezing water. The model's 3 step approach is similar to how one would convert a block of ice into a different shape. The steps are to 'unfreeze', 'change', and 'refreeze'. Taken the frozen block of water as an example, it first has to be melted before it can be 'changed' into a different shape with the help of a container. 'Refreezing' it would enable it to maintain its new shape. This sounds great in theory but the reality is more complicated than this.

The definition of the Kurt Lewin's change model in relation to the realities faced at organizations has summarized by [9]. Kurt Lewin does not only propose a model to work with but also different perspectives with which to approach a change management. The latter is alluded to in Kurt Lewin's statement, "one should not think in terms of the 'goal to be achieved', but look at all the options available to go from the 'present level to the desired one'".

The people part of an organization is not a straightforward dynamic but rather a complicated one. The concept of 'forcefield', also devised by Kurt Lewin, aims to explain this phenomenon more clearly. The aim of the organization is termed 'vested interests' and are best achieved when a state of 'equilibrium' is achieved. The state of 'equilibrium' is

achieved when both the driving forces for change and the forces of resistance to change roughly equal one another. This makes for the best environment in which change can be implemented, albeit not without some effort. Kurt Lewin, being a psychologist, focuses greatly on the human factor of change management and thus may not be well suited with change that requires focus on other areas as well.

D. Kotter's Eight Step Change Model:

The eight-step change model was introduced by John P. Kotter in his book, *On Leading Change* published in 1996 [10]. As the name suggests, it has eight main steps which can roughly be summarized as follows: (1) Creating a sense of urgency, (2) creating a guiding coalition, (3) developing a vision and strategy for change, (4) communicating aforementioned change vision, (5) empowering employees, (6) generating short term wins, (7) consolidating gains and producing more change, and finally (8) making sure the change sticks by engraining it in the (organizational) culture.

These steps have been updated by Kotter's organization to keep it relevant with the times, as described in [11] and summarized in [12]. The enhanced version of the change model changes a few of the steps, namely the 4^th, 5^th, 7^th and 8^th. They are replaced with (4) enlisting a volunteer army, (5) enabling action by removing barriers, (7) sustaining acceleration and (8) instituting change, respectively. The model bases its foundation on balancing management along with leadership to institute successful organizational change.

The steps are elaborate and leave very little room for ambiguity. However, it can be seen that this model focuses greatly on change management at organizations which involve different levels of managers and employees along with executives at the top of the hierarchy. Some of its steps, such as (1), (4) and (5) specifically target this scenario and the model would definitely need to be adapted if it were to be used in some other context.

In contrast, the MEB 2015 involves several organizations which include but are not limited to the Ministry of Education, other relevant government agencies, public and private HLIs. The architecture for management is not as straightforward in this case as the eight-step model considers. Involved stakeholders such as private HLIs in the current system have to follow guidelines put forth by the government but their management is their own responsibility. It can thus be argued that this model does not cater well to the scenario at hand.

V. METHODOLOGY

The MEB places the needs of learners at the heart of its plan and the changes that it is proposing will have a a major effect on students across Malaysia's IHLs. Thus it is important to consider how the students at IHLs feel about the changes that are being proposed by the MEB. Students' feedback will be critical for the successful implementation of the MEB. The same will hold true at the institutional level. Also, one of the major objectives of the MEB is to sustain leadership commitment and focus on the top. At the national level this include the top government and ministry leadership. At the institutional level, this would include the top management of the university and student leaders. In terms of IT projects, the MEB plans to enhance online learning and lifelong learning system infrastructures.

Thus, whether it is a national wide change being made to the education system for all IHLs, or an individual change being made by a particular IHL, the most appropriate change management methodology applicable based on our understanding of the reviewed methodologies in this paper would be the 4Ds approach to change as proposed by [1]. The 4Ds method can be easily scaled up or down to fit the scale of change required. This methodology also focuses on sustaining and cultivating leadership and providing support to the people affected by the change. Thus the methodology is also in line with the key objectives of the MEB. The project will also utilize the eight lens framework proposed by [1] to evaluate the success of change implementations at IHLs.

VI. CONCLUSION AND FUTURE WORKS

This paper introduces the concept of change management, gives a background of the context of the study, i.e. Role of Change Management in the successful roll out of IT projects at IHLs in Malaysia and reviews existing popular change management methodologies. Future work will involve testing and evaluating the selected change management model (The 4Ds model) to determine the role of change management in the successful roll out of IT projects at IHLs in Malaysia.

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