Evaluating the 4Ds Change Management Model for its Potential Implementation in Managing the Change for IT Projects: A Case Study of Higher Learning Institutes in Malaysia

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Abstract: **Change is inevitable. Every organization must adapt to the changes happening around them in order to survive as a business. The education industry is also changing. Universities are becoming more dependent on web technologies to deliver their services. The same web technologies are also utilized to run the administrative operations within a university. These technologies are constantly evolving and thus universities will have to replace or upgrade their existing systems from over time. This transition from the current state to the future state must be structured according to a change management methodology. We will evaluate the 4Ds (4Ds stand for Diagnose, Design, Develop and Deliver) change management model in order to determine its viability for use at Institutes of Higher Learning (IHLs) that plan to roll-out new IT projects/systems. We selected the International Islamic University Malaysia (IIUM) as our subject for this case study. This study focuses on evaluating the 4Ds model by means of questionnaires based on the key focus areas of the model. A total of twenty questionnaires were received from senior-level executives of various key centres, divisions and offices at IIUM. The results were analyzed and discussed and thus the study concluded the suitability of the 4Ds model for use at IHLs for rolling out new IT projects.**

Keywords: **4Ds Change Model, Higher Learning Institutes, Malaysia IT Projects, Change Management.**

I. INTRODUCTION

Change by definition refers to "alteration, variation and conversion" [1] and in the context of organisations, is inevitable. Change in technology, regulations, policies, etc. are the triggers of change within organizations and societies. The need for change is not a recent phenomenon and perhaps the "only constant is change itself" [2]. These change triggers are themselves a result of needs of the society at large, be it the need for a new web technology, the need for change in regulations because the current regulations impact performance or a change in a company's policy because it is no longer applicable due to changing circumstances. [3] has alluded that the reasons for change are an ever changing business environment and a changing economy. [4] has mentioned globalization, technology advances, complexity of multinational organisations, increased frequency of foreign and external partnerships, and "other enablers and accelerators of change". No organizations can escape change for too long. Eventually it will catch up to everyone. Organizations need to adapt to change quickly and efficiently in order to remain relevant in their respective markets. Change management, however, is not only concerned with technology but with people as well [3] [5]. This must be taken into consideration when conducting change management. Thus, an organization must evaluate change management frameworks/models according to requirements that will enable it to transition from its current state to its vision of its future state. Change is no longer a matter of doing, but of how.

Change management refers to the processes, tools and techniques to manage the people side of business change to achieve the most successful business outcome [6]. According to [7], the essence of change management is to create a change-friendly context for all change processes. According to [8], 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. After implementing change, it is also responsible for ensuring that change "sticks" so that the organization does not fall back to its original, lesser state [9].

This paper is a continuation of our work from [10]. In [10] our focus was on reviewing existing change management methodologies/frameworks/models and determining the most appropriate change management methodology/framework/model that could be implemented by Institutes of Higher Learning (IHLs) when they want to roll out a new IT project within their organization in order to fulfil the aims of the Malaysian Education Blueprint [11]. We concluded from [10] that the most appropriate change management methodology/framework/model for successfully rolling-out IT projects at IHLs was the 4Ds change management model.

This paper focuses on evaluating the 4Ds change management model to determine its viability as a change management model that can be implemented by IHLs when they want to roll-out a new IT project. This evaluation was done based on a study conducted at one of the popular IHLs in Malaysia: International Islamic University Malaysia (IIUM). The study focused on evaluating the 4Ds model by means of questionnaires based on the key focus areas of the model. The study also focused on determining the existence of a change management framework at International Islamic University Malaysia. The study finally concluded the suitability of the 4Ds model for use at IHLs when a new IT project is to be rolled-out.

II. METHODOLOGY

The study implemented a quantitative approach. Using a quantitative approach allowed us to quantify the validity and relevance of the 4Ds change management model for its potential implementation when a new IT project needs to be rolled-out at the International Islamic University Malaysia and by extension at any other IHL in Malaysia. The study involved 20 respondents from a total of ten key Centres, Divisions and Offices within IIUM. These included the Management Services Division (MSD), the Finance Division, the Office of Corporate Strategy, the IIUM Library, the Centre for Postgraduate Studies (CPS), the Alumni and Career Services Division, the International Affairs Division, the Office of Legal Adviser, the Office of Industrial Links and the Student Affairs and Development Division (STADD). The respondents from all the above Centres, Divisions and Offices were senior-level executives (i.e. business process owners) of their respective Centres, Divisions and Offices. The respondents held positions of Deputy Directors, Senior Assistant Directors, Assistant Directors etc. The number of respondents chosen from each of the above mentioned Centres, Divisions and Offices depended on the number of senior level executives available. For example, STADD, Finance Division and Office of Corporate Strategy had a larger number of senior level executives as opposed to the Office of Industrial Link or the Office of Legal Adviser. So the number of respondents from STADD, Finance Division and Office of Corporate Strategy was higher than the Office of Industrial Link or the Office of Legal Adviser.

Our aim was to cover all the central agencies in IIUM. However several of the Centres, Divisions and Offices we visited for the survey did not agree to participate. Some cited unavailability of senior-level executives at the time, while others felt that the survey was not relevant to their particular Centre, Division or Office. In the end only 20 responses were received from 10 different Centres, Divisions and Offices.

The respondents were given a questionnaire consisting of eleven questions. The questionnaire was split into two parts. Part one consisted of three questions related to the current/existing change management methodology/framework/model used by IIUM. These included a question about their knowledge of whether a change management methodology/framework/model existed in IIUM. If the answered in the negative to this question, they were asked to skip to part 2 of the questionnaire. If they answered in the affirmative to this question, they were then further asked whether they knew when this existing change management methodology/framework/model was executed/initiated in relation to the implementation of a new IT project. They were then further asked whether they knew which change management methodology was IIUM's change management methodology/framework/model based on.

Part two of the questionnaire asked questions that were derived from the key focus areas of the 4Ds change management model. The respondents were asked about the scale of change when a new IT project is implemented at IIUM. They were then asked about when they believed was the best time for executing a change management plan. They were further asked to choose the most critical success factor they believed determines the success of an IT project. The respondents were then asked about the importance of considering resistance to a change from employees when a new IT project is planned that will replace or upgrade the existing system. They were further asked about the importance of a change leader and the need of a communications strategy. Finally, they were asked about the importance of providing support to employees after a change has been implemented and the importance of continuous support in terms of operational support and resources to IIUM by the top management in order to realize the positive impact/outcome of the new IT project.

The data from the twenty respondents was collected and compiled for a critical analysis. The following sections describes the analysis of the data that was collected and presents the results of our analysis.

III. ANALYSIS AND RESULT

Twenty senior-level executives from the various centres, divisions and offices of IIUM participated in the survey. The number of respondents chosen from each centre, division and office depended on the number of senior-level executives within that particular centre, division and office as was explained in the previous section. The respondents held various senior-level ranks such as Deputy Director, Senior Assistant Director, Assistant Director, etc., within their respective centre, division or office. The following table shows the demographic distribution of the respondents according to the centre, division or office they belong to.

Table I: Summary Of Demographic Distribution

NAME OF CENTRE, DIVISION OR OFFICE	NUMBER OF RESPODDENTS
Management Services Division (MSD)	1
Finance Division	3
Office of Corporate Strategy	3
IIUM Library	1
Centre for Postgraduate Studies (CPS)	2
Alumni and Career Services Division	1
International Affairs Division	2
Office of Legal Adviser	1
Office of Industrial Link	1
Student Affairs and Development Division (STADD)	5
TOTAL:	**20**

As we can see from the above table, the respondents were from a total of 10 different centres, divisions and offices of IIUM. The number of respondents from certain centres, division and offices such as the Student Affairs and Development Division (STADD), Finance Division and Office of Corporate Strategy was higher due to the higher number of senior-level executives working at each of them and also due the their willingness to participate in the survey. Though other centres, divisions and offices also had higher number of senior level executives, they were, however, either unavailable or unwilling to participate in the survey. The following sections describe the analysis of our collected data and present the results.
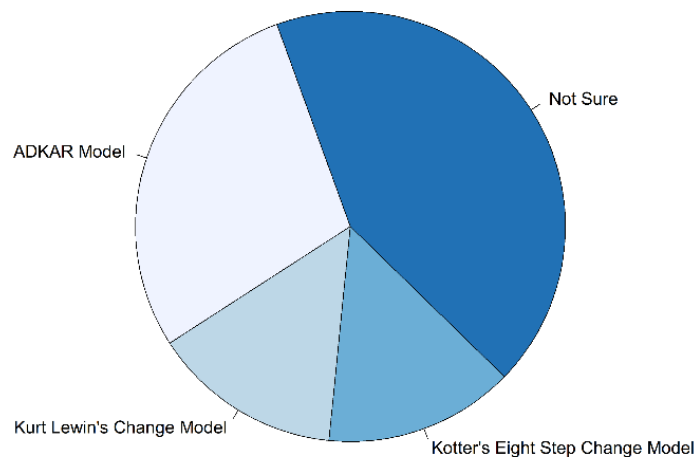
A. The Current/Existing Change Management Framework:

Part 1 of the questionnaires consisted of three questions about the current/existing change management framework at IIUM. We first asked the respondents whether they knew if IIUM currently has a change management framework in place for managing change when a new IT project is introduced. Out of the 20 respondents, 7 (35%) said yes that IIUM has a change management framework in place, 8 of them (40%) said they didn't know, and 5 of them (25%) said no there was no change management framework in place (Fig. 1). So the great majority (75%) said that either a change management framework doesn't exist at IIUM or they are not sure of its existence.
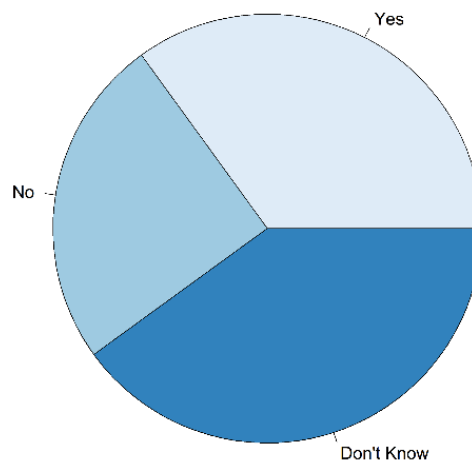
**Fig 1: Does IIUM have a change management methodology/framework when a new IT project/system is introduced?**

Though we can argue that not all senior-level executives will necessarily have knowledge about a change management framework, but the problem doesn't end there. For those respondents that said a change management framework exists in IIUM, they were further asked about the change management framework that the current IIUM change management framework is based on. 43% of the respondents said they didn't know which model was the current IIUM change management framework based on. 29% of the respondents said it was based on the ADKAR model, 14% percent said that it was based on the Kurt Lewin model and another 14% said that it was based on Kotter's 8 step model (Fig. 2).

Fig 2: What is the basis of IIUM's change management framework?

We can see a clear uncertainty about the basis of IIUM's change management framework. While the majority said they don't know which change management framework it is based on, those who mentioned a specific framework were evidently divided among themselves. We can thus conclude that there is an uncertainty with regards to which change management methodology is currently being followed by IIUM.

The final question about the current/existing change management framework asked the respondents when the existing change management framework is executed/initiated. More than half of the respondents (57%) said that it was initiated during the life-cycle of a new IT project, 29% said that it was initiated before a new IT project life cycle begins whereas 14% percent said that it was initiated after the new IT project was completed (Fig. 3).
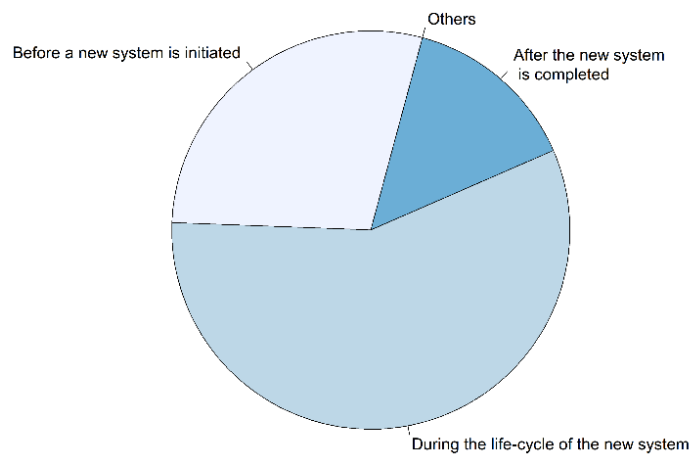
Fig 3: When is the existing change management framework/methodology put into action?

This question gave us an insight into when the current change management framework is initiated. We will later compare this to the 4Ds model and discuss the differences between the recommended stages of execution for the 4Ds model with regards to the current practice of IIUM which is initiated the change management framework during the life cycle of a new IT project.

B.   Evaluation of the 4Ds Model:

This model was introduced by [6]. The 4Ds represent the following four phases: Diagnose, Design, Develop and Deliver. Part 2 of our questionnaire was based on the key focus areas of the 4Ds model which include: scalability, a project managed approach to change (estimating the changes that will take place before a new project starts), people, and importance of considering resistance to change, cultivating leadership, developing a communications strategy and sustaining change. We proceeded first by determining the scale of change when a new IT project is implemented at IIUM. We asked the respondents about how many Faculties, Centres, Division, Institutes or Offices are usually affected when a new IT project is implemented. Almost half of the respondents (45%) said that the whole university was usually affected when a new IT project is implemented. 40% of the respondents said that more than one Faculty, Centre, Division, Institute or Office are usually affected whereas only 10% said that usually only one Faculty, Centre, Division, Institute or Office are affected. A small percentage of the respondents (5%) said that it depended on the IT project being implemented (Fig. 4).
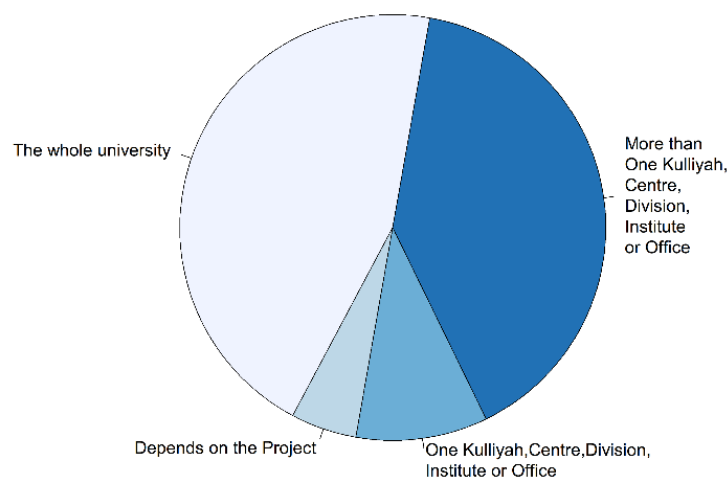
Fig 4: Scale of Change at IIUM

From the above Fig. 4, we can clearly see that usually the scale of change is quite high when a new IT project is implemented at IIUM. This means that all of the administrative employees, academic staff as well as students are usually affected by the change. This means the adoption of the new IT project becomes crucial due to large scale of the project. Thus a great focus is required to make sure that everyone adopts to the change.

The respondents were asked about when they believed was the correct time to put a change management plan into action. 65% of them said that a change management plan should be initiated before a new IT project is initiated, 20% of them said it should be done after a new IT project has been completed and 15% of them said that it should be done during the life cycle of the new IT project (Fig 5).
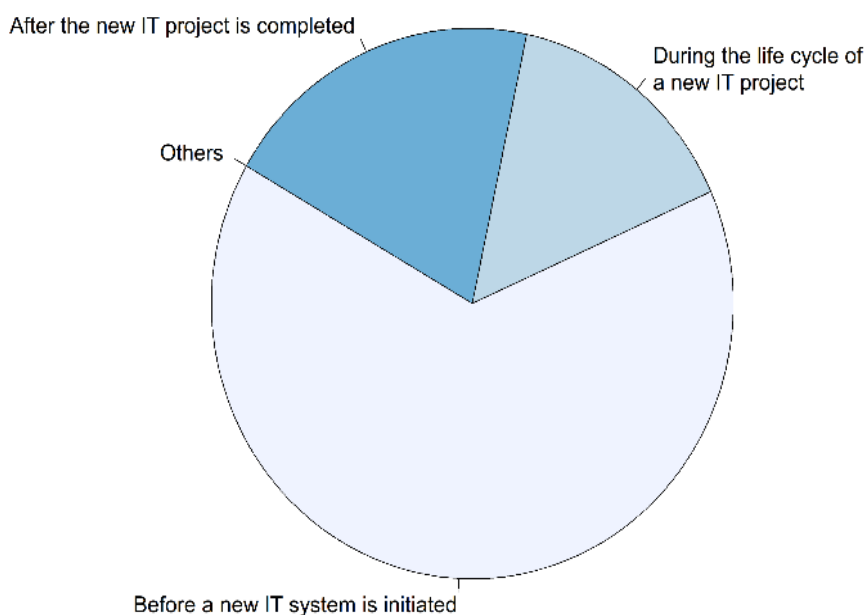

Fig 5: Best time to execute change management plan

We can clearly see a difference between what the current practice (initiating the change management plan during the life cycle of the new IT project) and what the respondents believe the practice should be, i.e. the change management plan should be initiated before a new IT project starts.

We proceeded by asking the respondents whether they believed it was important to consider the resistance that a change (in this case a new IT project) might face from the employees. The overwhelming majority (95%) said yes resistance to a change from employees was an important factor to consider whereas on 5% said that it was not important. We then asked the respondents how important they felt the role of a change leader was. The great majority of them (80%) said that it was extremely crucial, 15% said that it was moderately important and 5% said that it was not important at all. We further asked the respondents about the importance of having a communications strategy when a change is to be implemented. The respondents unanimously agreed that it was necessary to have a communications strategy when implementing a change.

We asked three final questions related to successfully implementing a change and then sustaining that change. First, we asked the respondents what they believed was the most important factor in determining the success of a new IT project. 85% of the respondents said that the most important factor in determining the success of a new IT project was the positive impact/outcome of the IT project on IIUM's performance in terms of cost optimization, increased productivity etc. 10% of the respondents said that the most important factor in determining the success of a new IT project was the successful adoption of the new IT project by IIUM employees. Only 5% of the respondents believed that success would be measured just by the successful completion of the project itself (Fig. 6).
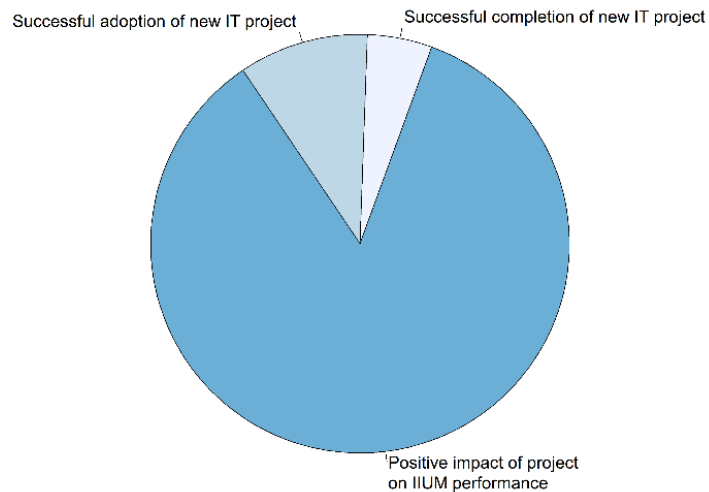
Fig 6: Most important factor determining IT project success

If we analyse the above Fig. 6, we can come to certain interesting insights. Even though the majority of the respondents declared positive impact/outcome of the IT project on IIUM's performance as the most important factor of the project, this positive impact/outcome cannot be achieved unless and until the new IT project/system is successfully adopted by the employees If the employees resist the new IT project/system, it will have a negative impact on productivity and costs. Therefore, we believe that successful adoption of the new IT project/system is a more critical factor in determining the success of the project because it will determine when the impact of the project will be positive or negative.

Second, we asked the respondents how important it was to provide support (both emotional and operational) to the employees affected by the implementation of the new IT project/system. The vast majority (80%) believed it was extremely crucial to do so, 15% said it was moderately important and only 5% said that it was not important at all (Fig. 7).
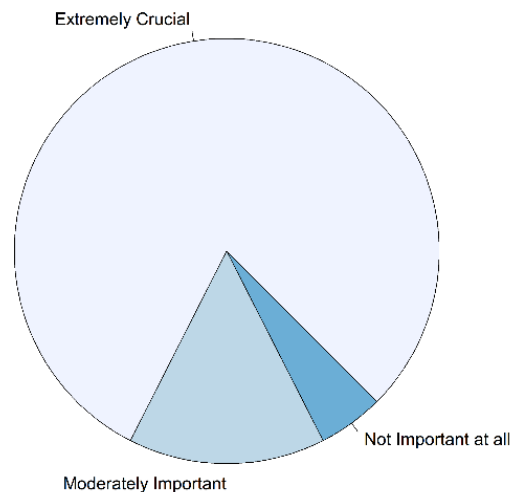
Fig 7: Importance of providing post-implementation employee support

This question closely relates to the previous question about the most important success factor in determining the success of a new IT project (Fig. 6). Even though only 10% of the respondents thought that successful adoption of the new IT project/system was a critical success factor, but their response to the above question about the importance of emotional and operational support for employees suggests that successful adoption actually plays a crucial role in determining the success of a new IT project/system. Without proper support the employees will not be able to use the new IT project/system effectively thus reducing performance which will affect the expected outcome of the project.

Third, we asked the respondents how important it is for the top management to provide continuous support (operational support, resources etc.) to IIUM in order to realize the positive impact/outcome of the new IT project/system after it has been implemented. The vast majority (80%) said it was extremely crucial for the top management to provide continuous support to IIUM in order to realize the positive impact/outcome of the new IT project/system after it has been implemented. 20% of the respondents said it was moderately important. None of the respondents believed that it was not important at all (Fig. 8).
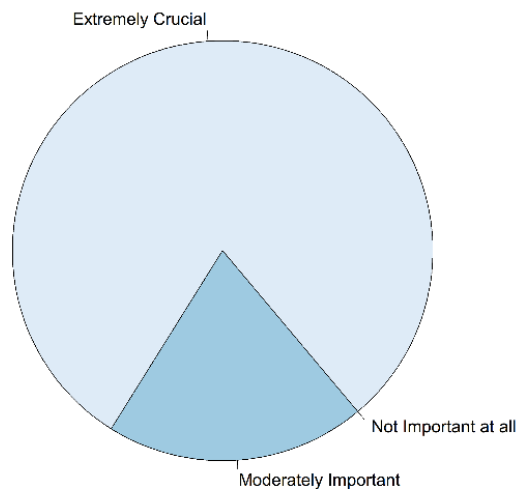
Fig 8: Importance of providing continuous support to IIUM to ensure positive impact

This question also closely relates to the question about the most important success factor in determining the success of a new IT project (Fig. 6). 85% of the respondents said that the most important factor in determining the success of a new IT project was the positive impact/outcome of the IT project on IIUM's performance in terms of cost optimization, increased productivity etc. Thus we can see clearly the relationship between this critical success factor and the importance of providing continuous support to IIUM by the top management to realize the positive impact/outcome of the new IT project/system after it has been implemented.

IV. CONCLUSION

The scale of most IT projects implemented by IIUM usually affects the whole university and thus affects everyone involved in the university including administrative staff, academic staff and students. So everyone must adopt to the new system. Also, this large scale of change means that there is a likelihood of more resistance to the change when compared to a small scale change. The 4Ds model focuses on the people side of change management including how to help everyone to adopt to the change and how to deal with resistance to the change. The 4Ds model can also be easily scaled up and down. Our data analysis showed that the majority of the respondents believe that the change management plan should be initiated before a new IT project is started. The 4Ds model caters to this idea as it involves developing a change management plan and initiating it before the start of an actual project.

Our data analysis also showed that most of the respondents believed that a change leader is a crucial factor in realizing the change. The 4Ds model comes in here as well as it focuses on cultivating leadership and turning leaders into role models for others to follow. Finally the key for sustaining any change is providing continuous support to the employees affected by the change in order to realize the positive outcome/impact of a project. This was reflected in our data analysis as well where the majority of the respondents said that providing continuous support to the employees and the whole of IIUM in general by the management was crucial in order to gain a positive impact out of a new IT project. The 4Ds model provides special emphasis on providing support to employees affected by the change through techniques like process reinforcement, system compliance, motivators and operational support as discussed in [10].

We are thus lead to the conclusion that the 4Ds change management model can very well be used as a change management model by IIUM for successful roll-out of IT projects in the future.

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