

Empirical Investigation on Agile Methods Usage: Issues Identified from Early Adopters in Malaysia

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Abstract. Agile Methods are a set of software practices that can help to produce products faster and at the same time deliver what customers want. Despite the benefits that Agile methods can deliver, however, we found few studies from the Southeast Asia region, particularly Malaysia. As a result, less empirical evidence can be obtained in the country making its implementation harder. To use a new method, experience from other practitioners is critical, which describes what is important, what is possible and what is not possible concerning Agile. We conducted a qualitative study to understand the issues faced by early adopters in Malaysia where Agile methods are still relatively new. The initial study involves 13 participants including project managers, CEOs, founders and software developers from seven organisations. Our study has shown that social and human aspects are important when using Agile methods. While technical aspects have always been considered to exist in software development, we found these factors to be less important when using Agile methods. The results obtained can serve as guidelines to practitioners in the country and the neighbouring regions.

Keywords: Agile Methods, Factors, Barriers, Software Process.

1 Introduction

Agile methods have been increasingly adopted by organisations developing software. However in Malaysia and in the South East Asia region, we see less evidence about the current usage of the methods among practitioners [1]. This is the gap we would like to reduce. Agile methods are different from other earlier methods in that they are a set of approaches which concentrate on the collaboration of customers and developers. If these methods are to be used, we need to primarily understand what works and what does not work for the people in the country. We also need to know which factors (either social or technical) are important when using the methodologies. To answer these questions, we conducted an empirical study to understand how Agile techniques are adopted in Malaysia. We chose the early adopters, as we think this is an appropriate time to interview them while the issues and challenges are still clear in their mind. We need to mention here that this study forms part of our research; therefore the results presented here only refer to issues relating to the early adoption

of Agile methods in the country. The results will help us to develop and refine our hypotheses for the next stage of our research.

In this paper, we will provide the background and motivation of our study followed by the objectives and the expected contribution. We will review the related works of our study and describe the methodology we use. We present the results, a discussion and finally the conclusion and suggestions for future work.

1.1 Background and Motivation

Our research is to investigate issues of implementing Agile methods in Malaysia. As only limited studies about Agile methods in the region can be found [2], this is the gap in the research that we would like to narrow. Lack of knowledge about Agile methods can act as a hindrance to the people who are planning to adopt it. Agile methods are sets of software processes which are dependent on how people use them [3], therefore if the method is going to be used, we need more empirical evidence for the suitability of Agile methods. However, we found inconsistencies (see section 1.2) from results referring to the suitability of Agile methods.

Furthermore, with regard to the importance of information and communication, ICT has become one of the key elements under the tenth Malaysia plan (2011-2015)¹. However, Malaysia is still lacking in the usage of good software processes and has been identified as having problems in delivering good quality products, on time and on budget [4]. One paper described Malaysia as experiencing people-related problems when developing software [5], and that the adopters do not have a clear methodology against which to illustrate the requirements [6]. In order to adopt good practice in software development understanding the software process is critical. All of these reasons have motivated us to support the introduction of Agile methods in the country. At this stage we will identify issues related to the adoption of Agile methods. In this investigation, we aim to address three key questions:

- 1) How practitioners in Malaysia adopting Agile methods?
- 2) What are the factors that make practitioners in Malaysia using Agile Methods?
- 3) What are the difficulties faced by them?

1.2 Review of Related Work

Agile methods are sets of new approaches for developing software [7] which are based on practitioners' experiences [8]. The intention of the Agile manifesto is to solve the issues and problems that were found in software development [9, 10]. Agile practices are adapted from existing techniques and ideas found in the software development information field, where its usage depends on the suitability and the appropriateness of the team, organisation and project. A systematic review of empirical studies of Agile up to 2005 was conducted by Dyba and Dingsoyr [11]. Although Agile methods are considered suitable for many environments, there is, however, lack of empirical evidence to validate their suitability [11]. This is the area which we will further investigate.

¹ www.bernama.com/bernama/v5/newsbusiness.php?id=504844
(accessed 18 June 2010).

Software development is also about dealing with people and the organisational factor. An important aspect under the organisational factor is to consider the characteristics of projects and teams in the organisation. It is also important to understand the features and the environment within which the development is taking place. One study stated that these characteristics can also be linked to the organisational factors [12]. As mentioned by Cockburn and Highsmith [3], good communication is important in the implementation of Agile methods. However others [13] found insignificant results from the communication aspect. Agile is only suitable for specific types of software projects [14] while one study found no significant results concerning the factor of project types or nature [7]. Having identified the factors related to the people and social aspects concerned with the successful usage of Agile methods, several studies have started to investigate factors related to the organisational culture [15-18]. One study found that organisational culture plays an important role in the adoption of Agile methods [15]. Another study reported no significant findings in terms of organisational culture with adoption of Agile methods [7].

People are part of the Agile ecosystem, which is why their talents, skills, experience and communication have become the primary concerns for the success of the adoption. It is not surprising that many studies on effectiveness and adoption of Agile methods focus on people [19]. One study also confirmed the 'people' aspect as the key success factor in Agile methods [7]. In addition, from its early introduction, the method has been described as a set of approaches that concentrate on people and social aspects [3]. However, in one study, technical factors were also reported to be significant for Agile implementation [7], although not in the tools, but in the delivery strategy and Agile software practice. Nevertheless, insignificant results in technical competency have also been found [13].

Agile methods do not rely on heavy documentation as they depend on the tacit knowledge. Yet people always question how the team can adopt the methods if it does not have any documentation relating to the works they are undertaking. This is one issue that may be questioned by the early adopters of Agile methods, particularly for a country where limited study about the method can be found. One study described the creation of knowledge as a factor in the adoption of Extreme Programming, one of the Agile practices [19]. However it is not an easy task for the team to share and rely only on the knowledge they hold among themselves. One study suggested that the team should also possess the skills and should be highly motivated [20]. That is, the collective capability of the team is critical for the success of Agile [7]. On the other hand, different evidence shows that capability, professionalism and experience have actually hindered the adoption of Agile methods [12], but training [13], management involvement and access to external resources were among factors to have a positive impact on the implementation of Agile software methodology [21]. Conversely a study also found significant results in terms of technical factors [7]. We need to further investigate the inconsistent results we have reported, based on the literature studied, and to understand the relative importance of each of these factors.

1.3 Objectives and Expected Contribution

The main objective of this paper is to describe the issues and problems faced by the early adopters in Malaysia when implementing Agile methods. We should highlight

here that the findings are based on a small sample, and so it might not be valid to generalise this study to the whole population in Malaysia (and so we intend to increase our sample size in future work). However the selection of respondents and the locations of the companies have helped us to generalise these results.

The contribution of our study is to reduce the gap within the adoption factors in the country and the region where scant and contradictory research about Agile methods can be found. In addition, the knowledge can help practitioners to further understand and compare the suitability of Agile methods adapting to their organisation and people.

2 The Study

In this paper, we aim to qualitatively understand how new adopters in Malaysia are using Agile methods. Qualitative data are richer in content; thus this approach increases the amount of information collected [22]. We intend to understand the factors concerned, and at the same time we seek to identify the barriers and areas of resistance relating to the adoption.

2.1 Methodology

As software development is involved with human factors, empirical study is the way to understand how software processes work. We applied a qualitative semi structured interview in this study. At this stage, the results of the interviews are used to explore the issues relating to the adoption of Agile methods in the country. The semi structured interview includes a mixture of open ended questions as '*it is designed to elicit not only the information foreseen but also unexpected types of information*' [22]. Understanding issues of Agile adoption in Malaysia is important because little knowledge exists in the country and no previous research about the topic can be found. Therefore empirical study applying the qualitative research method is suitable to look at unknown and never explored scenarios [23].

The data were collected between February and March 2010. The investigation took place in seven organisations in Malaysia involving 13 participants including project managers, the CEOs, founders and software developers. This number of respondents is considered appropriate for this kind of study [24]. Another source suggested having six to 10 subjects for interview [25]; it was also stated by adding more subjects, the research will diverge and become difficult for the researcher to draw strong conclusions.

All respondents were using Scrum method, which contrast with the findings of other researchers [11] who found XP was the most popular method. Two organisations were identified from our initial questionnaire and the rest of the respondents were known from a Scrum workshop that was held in Malaysia. It was the second workshop (10-12 March 2010) held in the country². The number of participants in the second Scrum workshop has increased to approximately 100 participants while the first workshop had only about 20 participants. The interviews were recorded using a digital voice recorder and each of the interviews took no more

² http://www.asiaictpm.org/mpc_event.php?id=94

than one hour. Prior to recording the interview, we sought the respondents' consent by providing them with a form to be signed. If they agreed, then we started the recording. At the same time, the researcher took handwritten notes, which serve as a reference and can be compared with the audio recorded data.

2.3 Data Analysis

We use a 'Thematic Analysis' to analyse our data. A thematic analysis is a way of seeing things and patterns within the information collected, a process also known as pattern recognition. Codes are produced from themes which are developed through several stages [26]. We chose Thematic Analysis as it is a process used as part of many qualitative methods [26].

In order to develop themes and codes, the raw information (the data) need to be reduced. 'Reduce' here means to filter and remove any information which is not relevant to our study. We listened to the audio recordings and compared the information with the notes we took during the interview. We transcribed the information from these two sources. Only the information related to the questions was transcribed. We referred back to the questions to ensure we had transcribed the responses correctly and that we had not omitted any important information. After the transcription, the themes were identified within the subsamples. The processes and stages were repeated for all of the interviews. Once the themes within the subsamples were identified, they were then compared across subsamples. Lastly, we created codes from these themes as presented in our results section. In this paper, we will present the results by introducing the organisations we interviewed. Then the results section will describe the issues faced by the organisations in the adoption of Agile methods. We group the issues into categories such as knowledge, mind set, people, project, management, knowledge transfer, organisational structure, communication and technical aspects. These results illustrate issues related to the factors, barriers and the way practitioners in Malaysia are using Agile methods.

3 Companies' Overview

In this section, we present an overview of the companies we interviewed. Table 1 introduces a snapshot of the companies' background. All of the companies we interviewed practice the Scrum method, responding to the review undertaken by Dyba and Dingsoyr [11]. We use Agile methods and Scrum interchangeably in this section. For company A, the switch to Agile Methods resulted from the frequent changes and scope of its requirement, especially when they are implementing a government's project. An interviewee said: *"When you are implementing Scrum in a government project, you are able to deliver as per what they want at that time rather than you waiting until the whole specifications have come out and signed off only then can you deliver. Now with a small scope you can actually deliver so they can actually use it."* Company A started to use Scrum over two years ago, but with no proper training. The interviewee said that they failed to implement Scrum correctly without training but fortunately managed to do so after training.

Table 1. Summary of the Companies

Company	Types	Status of the Companies Interviewed	Company's Main Activity
A	Local Company	Fully adopting Scrum	Airport product development, critical system, r&d, middleware
B	Multinational	Fully adopting Scrum	Technology and services
C	Local Company (small and startup)	Scrum + Prototyping	Rapid web application development
D	Local company (Large)	Adopting only parts of Scrum	e-commerce
E	Local company	No longer adopting Scrum	Instrumentation and control solution-offshore and critical system
F	Multinational Company	Fully adopting Scrum	Technology and services
G	Local Company	At the very initial phase of adopting Scrum	ICT infrastructure solution

Company B started to use Scrum method when implementing a pilot project. *“It makes sense for our environment”* is one reason they continue to use it. They added *“it really help us in terms of getting the environment, and also adopting to changing of the time line, changing of the requirements in order to deliver our product in a phase by phase perspective”*. The company representatives we interviewed are project managers and developers. They are very enthusiastic about using Scrum and other Agile methods. This can be seen as all developers have a positive opinion about it.

In order to save time by building their own product, company C found Agile methods to be an alternative way to develop software. Initially they started practicing Agile without any training. The CEO stressed that it was difficult to learn Agile methods before they attended training about it in March 2010. The company combines Prototyping and Scrum method to understand the requirements of users. They stated that using Prototyping at the beginning is only to understand the requirements (without involving any codes) and the implementation still takes place in an Agile environment.

Company D believes in Agile, and expressed positive opinions about it. However, the organisation does not formally practice Scrum. It only applies part of the Scrum techniques. They believe that the environment and project should be suitable before fully implementing Scrum. Lack of emphasis on documentation is described as a weakness by both project managers in the company. They believe that for one to adopt Agile, people should find ways to mitigate the risks.

In company E, Scrum was introduced by the project manager. Ineffective results from the Waterfall model was the main reason for company E adopting Scrum. The implementation using Scrum was practiced through trial and error, and it was a decision taken by all the team members. Customers do not know about the method they are using; they are only involved when they have problems and when the team needs clarification of their requirements. From here, problems can be anticipated at an

early stage. The company project manager said that Agile was being practiced more in the process as they were doing tasks in order of priority and holding weekly reviews. He also added that it was difficult to introduce Agile, and that method is no longer used when he was transferred to another department. When asked about Agile methods in Malaysia, he admitted “*I never heard about any. In Malaysia, I think not many are interested. I don’t know any organisations that are using Agile methods*”.

Knowing the advantages Agile can deliver from its other sub-components made it easy for company F to adopt the method. Developers’ satisfaction and efficiency are among reasons why they prefer to use the method. Company G is at the early stages of Agile adoption. The project manager we interviewed had just attended a workshop on Scrum methodology. Issues described by this company are to understand issues adopters face at the early stage. This is what we intend to deliver through this study.

4 Results: Issues in the Factors of Agile Adoption in Malaysia

In this section we will describe the results we obtained from the interviews. All of the companies we interviewed practice the Scrum method. This scenario contradicts that of an earlier study specifying XP as the first chosen method in Agile [17]. Scrum is a project management focus with a Scrum master and daily stand up meeting. Scrum has become the preferred method for the early adopters in our interview. All of the organisations we interviewed are still at an early phase with a maximum of two years experience. We think this is an appropriate time as the issues and challenges in adoption are still clear in their mind.

4.1 Knowledge

In our study we coded issues about education and training into knowledge. Education leans more towards understanding the concept and roles and how Agile is different from other methods. Company A emphasises education for implementing Agile. It is essential to ensure that the customers fully understand the concept or how Agile works. Agile provides opportunities for the customers, where they are also taught to relay their requirements easier. For company A, educating the customer is important: “*...if the customer understands how it is going to be done, then it is easier to follow, rather than like previously when we were using Waterfall, because people are so familiar with the Waterfall, so they thought that they can understand how Waterfall works.*” As mentioned by the interviewee from company A, Scrum is not difficult to practice because both parties (customers and internal developers) can be managed easily as a result of practicing the method.

Company C also mentioned education. From their experiences, if the customers do not understand the method, it is difficult to use Scrum; as stated, “*Malaysian customers are not familiar with Agile methods and we need to help them in this matter*”. From the interviews, education of the customers in particular, and at the same time the developers’, is important to ensure everyone in the team plays their roles correctly.

Training is more for the practitioners and is about how to practice the method in a right and proper way. Practicing Agile methods takes time and requires understanding.

Agile is difficult to learn by oneself and most of the practitioners we interviewed admitted that they were not using Agile correctly before they attended the training. According to most of the interviews, Scrum only provides a framework, but to make it work in a company, it requires experience. *“Dare to fail at the first development”* is mentioned by one of the developers in company B.

Internally, the training department in company A provides monthly classes for Agile development. However, they still teach the Waterfall model to their development team because at the same time they are considering customers' backgrounds before deciding to use any of the methods. A respondent from company C gave an opinion on training: *“If we can have more training here, I think the adoption of the method will be boosted. Malaysia is still in the early phase, but you know, it's just that they don't know how to use Agile because the knowledge is not here, if we learn ourselves, surely it will be harder. You see my team came back from training, they quickly learnt the method from there.”*

One of the founders in company C added *“The first time we learnt Agile, we didn't know what to do, but when we go for training, they tell you what to do, you know and you confident.”* Company G also thinks training is important for practitioners to understand the method. Surprisingly, we did not hear any serious issue cited in terms of training from the two multinational companies we interviewed (companies B and F).

4.2 Mind Set

Apart from knowledge, mind set is equally important for the adoption factor of Agile methods. The mind set should be from the stakeholders' perspective (for example, team members, customers, project managers and management). Agile is different in terms of its way of working and thus requires a change in mind set. In other words, those involved must be willing to change the way they work especially those who have been using different methods for a long time. This is agreed by most of the companies that were interviewed (companies A, B, C, D and F). As stated by one of the developers in company B, *“These people are stuck in the Waterfall mind set and it can lead to a poor team dynamic.”*

The implementation of Scrum was initially difficult for company A when they were dealing with the government sector which is used to the Waterfall model – *“...so the first time that we implemented Agile, it was difficult because the method is not familiar to the government. The method is not familiar to them because they are so familiar with Waterfall stuff.”*

One of the founders we interviewed from company C suggested that the mind set must change first in order for the environment to support Agile methods. We discovered an interesting issue in company D which stresses that Scrum is a risky method because no emphasis is placed on documentation. Both of the project managers we interviewed from this company have a background in professional management (PMP). They still believe in Scrum as a way to survive in the business; however at the same time they need documentation to be imposed in the method. To confirm, we also obtained an opinion from company C: *“In Malaysia, when you have pmi/pmp background, you are not suited to Agile, because you have been trained to be in control, so if you are out of control- conflict.”*

According to company D, the mind set towards Agile methods does not only apply to the project manager but it requires the cooperation of the team and parties concerned. Although Agile is proven to be successful in many companies [27], the two project managers in company D stated that it will not be necessarily succeed in their company: *“To apply this to a business company like us, it is not necessarily successful. It is a matter of how do we change this people’s mind set. It requires the whole team to change, but if we only have some that are changing, and the rest are doing it their own way, we will not be successful, because the other group is waiting for documentation and other groups want to start doing work. The whole company has to adapt to that before we can do it successfully.”*

He also added: *“It can be very scary for people like us, for me, I am from the old school; I am PMP, which does not follow this kind of thing. Everything is on paper, formal. It’s difficult, but I like this new method. I want to experiment, but when I go in, I realised with this method, that you need this kind of professionalism, commitment, the passion in the project. If you don’t have those things, then you can’t practice Scrum. In Scrum everybody should be able to get up to par, being able to carry and run that entire thing. That is a very big challenge.”*

The mind set is also considered important in company C when they combine Scrum and Kanban for their development. These are combined to help manage several projects when using Scrum. *“In Kanban Scrum we do not have a time box.....-so team members must change their mind set. If before this the mind set is only to one project, but now it is multiple, which the focus can be on multiple projects.”*

4.3 People

All of the organisations we interviewed mentioned the importance of people’s attitude. Customers, developers and people involved in Agile must understand their roles and responsibilities. A representative in company A stated; *“We need to make sure that the product owners understand their role, so everybody in the team has to understand their role first. I think if they understand their roles, it will be easier because they understand the responsibility that they have, so that is very important.”*

The two organisations we interviewed (companies C and D) shared the problems of attitude and working style in their workplace. The resistance from company D can be seen from one comment: *“What do you need in your people in Scrum? You need them to be committed, to be skilled in what they bring to the table, we don’t have them. See, you can implement Scrum, but they will again refer to the boss (every time when given the tasks), then how to implement Scrum? This is one of the disadvantages, this is a core problem, when you do not go to the core problem, you will never solve it. Today you need people who are very committed, skilled, yes they are, but not enough of them, very few”.* The two project managers we interviewed from company D were from a professional management background (PMP) and used to have documentation for every task they performed.

The team members in company E waited for the project manager to start each daily meeting. If he did not, no meeting would take place that day, stated the project manager in company E. The method is no longer used following the transfer of the project manager to another department. Although there were several project managers at that time, they did not have the background of Agile methods and software

engineering. The project manager we interviewed suggested the use of Agile methods was not continued as he was the one who drove the methodology in the team which might have contributed to the decision to stop using Agile methods.

The two multinational companies (B and F) that we interviewed agreed that people are the essence of doing Agile methods. *“It is up to the individual”* said one developer from company F. He believes that the developer should be independent in order to succeed with the method. Responsibility and commitment are required. One of the developers in company B suggested: *“You need the team which is very self supportive, everybody helps each other to move the whole project forward. So each of the team members should know their particular role and responsibility. The biggest thing is commitment.”*

When asked what factors made the project manager in company B chose Agile methods, he replied: *“I think first thing comes to mind is team spirit. Scrum really encourages team work together and whole team commitment, that really helps team spirit, kind of like bringing everyone closer, because working in IT is more like, yeah, you deliver something, and have a fun environment, it is very important to me.”*

4.4 Project

Companies A, C and E are using Agile to develop critical and safety systems, which shows that Agile is also suitable for this type of project. Identifying the complexity of the project is also being considered in company A. Besides, before deciding to use Agile, it also seeks clarification of the project. This is the most important factor for company A to adopt Scrum for their development team. However, this again depends on the product owner and the customers' understanding. Company D also mentioned the types of project, and the types of product they developed before deciding to use Agile methods.

4.5 Management Involvement

When using Agile methods, one question always arose: how to obtain management buy-in and how to get their support? In addition, concerns are always raised over how to gain the interest of the customers in using the method. All of these scenarios require management to deal them.

In most organisations, choosing a method to use is based on the decision of the management. This is particularly common in large organisations. Management should be given a clear understanding about the method. Company A also thinks that people management (for example by ensuring the product owner understands his roles) is important when adopting Agile methods. The project manager in Company B struggled initially with his own attitude to the use of Agile methods: *“For me, I do have a struggle initially changing from Waterfall to Scrum. The first thing is not really to get the management buy in, the first thing is to get myself to buy in-as a project manager role.”*

The management factor is considered to be the first in practicing Agile methods from company C. Both interviewees from company C said: *“When management seriously wants to implement Agile, then adoption will be easier. Management top*

down is important, although we are very enthusiastic (team members), but when the top management does not believe in the method, it will not apply, and Agile cannot be practiced.”

Company D also believes management to be an important factor in the adoption of Agile methods. This can be seen from comments they have made: *“In order for us to practice it formally and successfully, implement it successfully, then we need from management right down to marketing, to understand that the methodology will be Scrum”*. Another comment which supports this statement is: *“It depends where you sit in the company, if you are in the top management, they will always go for Waterfall because they can easily see what can be delivered by man, but if you sit at the development model, you prefer to use Scrum because you want to see the product/result fast, that is why if you want to implement Scrum methodology fully, the top management must understand what is happening.”*

Company G is only considering how to get customer buy-in as the management has given the decision of using the new method to the project manager. This company is only in the very early phases of implementing Agile methods.

4.6 Knowledge Transfer

Using Agile, retention of knowledge is questioned when people leave the group. This could occur due to the nature of Agile methods which does not rely on documentation. Therefore, when a person or several people move out from a group, they must ensure the next person is able to continue the work. Staff turnover is the most worrying problem shared by two project managers who we interviewed from a local company (D). They agreed that a focus on getting the product faster is one of the best contributed from Agile working’s way, but the problem of staff turnover should also be mitigated. They also added that because Malaysia is experiencing this problem, full dependency on the developers should be avoided. Several comments were offered by company D regarding this issue: *“If you use Agile methods, things like Scrum, where the focus is not on documentation, you become very dependent on the developers, but in Malaysia our developers keep moving- move on and move on. If the knowledge resides in only one person, or only a few people, then you have an issue, the moment they leave your company, you’re dead.”*

Scrum in company D is no longer applied when the project manager was transferred as a result of this problem (no knowledge transfer). However, we did not find this problem discussed seriously in two multinational companies (B and F) that we interviewed. A project manager from company B shared that the problem of staff turnover is a common occurrence. He could not agree that the lack of documentation was the reason for not using Agile methods. As he said, people in development should be balanced and always allocate some time for documentation although the method they use does not focus on it. In addition, from his experience, he did not know of any company that is not using Agile to have a good record on documentation as claimed. Therefore, Agile methods could not be blamed for this problem.

Company A develops software for government projects. According to the representative from company A, the staff turnover rate in the government sector is high and people come in and out very often resulting in frequent changes in requirements. In order to overcome this issue, company A practices Scrum. For

company A, following the Waterfall model is not suitable for this kind of situation. A group of developers from a multinational company (B) believe in having a good coding for documentation. A clean code can serve as documentation that can be easily read by new staff.

4.7 Organisational Structure

Factor such as small organisations is more suitable to practice Agile [3, 19]. From the interviews, we found similar results; that small and startup companies are more appropriate for the culture of Agile. Company D agreed that the Agile method is more suitable for a small and startup company. This is because this type of company does not have any legacies that it must follow. However it is harder to practice Agile in a large, established company. Everything must be formal and documentation must be kept within the business. That is the reason why company D has only adopted certain practices that are suitable for the company.

In relation to small and start - up companies, company C claimed to have an Agile cultural environment. This could be a strong reason for them to practice Scrum fully. They believed in the method and started to practice Agile with their own effort. *“For a small startup company like us, it is good to have the culture of Agile, because it must be reflected in our values, which our value stated that the customer always comes first, they are not always right, but come first. In line with the manifesto of Agile where collaboration is more important, we believe Agile is the best for us. My point to highlight here - culture of Agile, it is very suitable for a start - up company like us.”*

One interviewee from company C stated: *“To get truly Agile especially in Malaysia, one has to change the culture, this means we as a society must be trained to be open and transparent, because Agile is about transparency, at all levels. As you see, the Malaysian working way is different, totally different, so society should change the mind set first then embed it as a culture, that’s the important thing.”*

It is not only the company that should provide the culture; the people or team members in the organisation should also embrace it. According to the respondent from Company C, the mind set of people practicing Agile must be changed first then the environment will adapt to that culture. Company B has similar opinions; as they said that Agile is suitable for them because it can be adapted to their dynamic culture. When asked the reason they are using Agile, one of the developers answered: *“Because it makes sense for our environment”*. One of the developers from company B added: *“In a way, the Waterfall model may not be as sufficient for a community like ours, because we are very reactive, we are very fast - paced and with Waterfall is just too rigid. Scrum gives us benefits because it is able to adapt to a dynamic culture.”*

A developer in Company B said, *“Organisational structure must not be rigid”* and the founder of company C suggested that the overall structure must be supportive of the culture of Agile. The structure is not restricted to internal parties but customers also should be included in it.

4.8 Communication

Usually developers will make assumptions when they do not have enough information about the requirements, and wrong assumptions create problems later on. We found

this is to be the case in companies A, B and C. Therefore, the emphasis on communication in Agile helps to solve the problem. That is why the documentation being used is essential, it is minimal but not zero.

One of the developers in company B mentioned that clear communication should be practiced when trying to introduce the methods. According to him, the project manager should also communicate the method clearly to the team members. He added that not having a clear understanding of what they are doing will attract more resistance from the team members. Instead of asking the team members to cooperate, the project manager received the objections from the team as they thought Agile practices were just wasting their time.

4.9 Technical Aspects

The companies we interviewed stated that the people factor and other social factors mentioned before are more important than the technical factor. The respondent from company B stated: *“That’s why I can do Scrum without any tools”*. A comment from a project manager in B referred to technical aspects; *“Scrum is basically only a framework, and I’ve been thinking about how come the tools that I have been used are not really there in the framework”*. However for company C, the technical aspect must also be there to support Agile methods. It is another factor for the success of Agile methods.

Another important aspect is communication tools. This is essential when a company has more than one team and also when these teams are not co-located. In this case, communication tools are used to share information through conversation. This is usually the case in a multinational company such as companies B and F. However, the problem is amplified when there is a difference in time zones. Inconsistencies in the conference tools they use can create problems in conveying the required information.

5 Discussion

Malaysia is still in the early phases of using Agile methods, and some respondents from our ongoing questionnaire and informal discussions have indicated they had not heard of Agile methods previously. At the time this interviews were conducted, to the best of our knowledge, only two workshops about Agile methods (i.e Scrum) had been held in the country. One was in December 2009 and the second was in March 2010, in which the researcher was one of the participants. Therefore, if more training is available, it can help to increase the rates of adoption among the practitioners in the country as agreed by most of the companies. The number of participants from the second workshop has increased from the first one and there were also repeating companies or participants in the second workshop. We also perceived passive resistance, learned anecdotally from the Scrum workshop. The participants we met (from the group not using the method) did not believe in Agile methods. They attended the workshop as required by their companies, maybe because the companies had become aware of the advantages of Agile. Clear demand for the training of Agile methods can be seen from the increase in the number of participants in the workshop.

The interview results also show that training is an important factor in the correct usage of Agile methods. These interviews are probably representative of Malaysia as a whole.

We have seen that people are an important factor, as stated by most of the companies we interviewed. This is so as the core of Agile lies in the people [3]. They should be cooperative and fully committed, as in Agile, it is the people concerned who decide what they want to do in the development. Although they will know their responsibilities and roles from training or education that might be provided by the company, nevertheless, the attitude must be open and transparent at all levels. Working in Agile is a whole team effort; thus all parties involved in Agile are required to act accordingly. For instance, the product owner should be in control, and communicative, to represent what the customers need and vice versa. The people in the team should also be independent. If team members cannot be independent and are always waiting for instructions then Agile cannot be practiced. Although it was not directly mentioned by company E, we identified that team members are not committed enough and do not possess the knowledge to continue the method; thus the method was discontinued. This scenario was identified in company E.

Company A places emphasis on education and checking customers' background before deciding to use the methods. This is important as customers have a role to play in Agile methods. However, company D stressed the importance of mind set, and Agile is lacking in documentation is identified as an obvious resistance from this company. If the mindset of the traditional method is still present in a person who is practicing Scrum, it will be harder for them to adopt the method. Agile is a way to collaborate, and if the stakeholders that involved do not participate then it is difficult to practice it. Lack of awareness or knowledge about the Agile method could be one factor causing this difficulty. These people are very familiar with the method they used before and this makes it hard for them to accept the new approach.

The participants from the workshop have also shared that it will be difficult to practice Agile with the attitude of the software practitioners they have. The question here is whether education or mindset should come first. If education or understanding is provided, then the negative resistance towards Agile methods might be reduced.

7 Conclusion and Future Work

In this paper, we investigated the issues about the adoption of Agile methods in Malaysia. The data obtained are to understand the factors and difficulties faced by the early adopters. On the basis of these initial interviews it seems the most important people factor can be classified as knowledge, mind set, commitment, management involvement, knowledge transfer, organisational structure and communication. This study will help us to generate and refine our hypotheses for the next stage of our study. It will also be used as our background in developing a model for the adoption of Agile methods in the country. Although many factors and issues have been identified from the study, we conclude that the social factors are more important to be considered when using Agile methods. While technical factors are always said to be important when developing software, however, we found these factors to be less important in our study. This is the issue that we need to investigate further in our future work.

We hope the results we obtained from this study will help practitioners not to underestimate the factors of social aspects when implementing Agile methods. We intend to conduct further survey (questionnaire and interviews) to develop and validate a model for factors predicting successful adoption of Agile methods in Malaysia. The relative importance of these factors will be quantitatively investigated in our future works. Lastly, we would like to thank all parties involved for their assistance in this study.

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