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Adroit and Systematic Study of Agile Methodologies Software Quality Assurance

Anum Hanif*

Department of Computer Science and Information Technology, Jinnah University for Women, 5-Cnazimabad, Karachi

Abstract

To work with agile methodologies is a big challenge in today's IT world. Although this methodology is fast and efficient but difficult to handle in many situations because it is a self-managing and self-disciplinary approach need full determination and dedication, it's purely business driven, delivery focused and people-oriented that was the main reasons that day by day software houses/companies adopt this methodology. Agile methodology have many different methods to follow form which In this paper we spotlighted the three agile methods named XP, Scrum and DSDM for finding which one of them is more favorable for today's IT industry. For this we surveyed eleven different national and international software houses/companies and asked questions from them on different facts and figures related to the agile methods they worked on and selected which one is most suitable in every situation.

Keywords: Agile methods; Software development; Project management; Best agile method in exploration

Introduction

Agile methodology, a software development trend that changed the working structure at almost every step of development for those who adopt it [1]. It does not contain upfront analysis and procedure based techniques. It is an iterative, time based, business driven and delivery focused approach. All what it needs is sponsors, development team and users should interact on daily basis and maintain constant pace through-out the development process.

Its total focus is on business requirements, tries not to repeat the older mistakes and looks for better to satisfy business requirement. It supports teams to select best architectures and designing techniques to provide a working product which is primary measure of success [2].

In this paper we researched on three different methods of agile family and selected best one among three that influences on the software development practices and results successful working software.

Research Methodology

In this paper, questionnaire based survey is conducted which includes some open ended and some close ended questions in order to collect required information and after that the best agile method is explored to get in practice [3]. The questions of survey are as follows

Q1: Which type of software house you are working/owned?

Q2: Is your software house is national/international?

Q3: What type of business it is?

Q4: Size of software house is large/medium/small scale?

Q5: Number of employees in software house?

Q6: Which Agile Methodology do you use from these three XP/Scrum/DSDM?

Q7: Why you are using this methodology?

Q8: When did you start using this methodology and before that which methodology you were using?

Q9: Does adoption of this agile process effect on delivery of good working product?

Q10: How much time period you define for one Sprint/Iteration?

Q11: What challenges do you face while using this methodology?

Q12: Have you ever faced any failure using this methodology, if yes what was the causes?

Q13: How many teams working in a single project (i.e. SQA, Development, etc.)? Name them:

Q14: Does this methodology effects financial volatility?

Q15: Is there any effect on resources while using this methodology (i.e. hardware, software, budget, etc.)?

Q16: How does it effect on relationship with customer?

Q17: Does involvement of customer during development effects on products' delivery on time?

Q18: Does involvement of customer during development effect on products' total estimated cost and effort?

Q19: Which type of progress tracking mechanism do you use and how does it help you in better productivity?

Q20: Are tools and technologies used in agile process effect on total estimated cost and effort?

Q21: Does risk analysis in agile process effect total estimated cost and effort?

Why to choose this area?

Now a day's agile methodology are being a part of almost every successful software company, it totally focuses on business requirements and aims to deliver fast, light and efficient product.

But it consists of several methods from which selecting one suitable in all situations is quite difficult many researches had been done on

these methodologies but still it is an out of sight secret [4-7].

Software Houses/IT Companies

The software houses and the information technology companies shown in Table 1.

Agile methods

The main focus of agile methods are on customer involvement, face-to-face conversation, minimum alterations in requirements, respond to changes, corporate culture, time allocation, small processes, active testing and customer relationship. There are several different methods in agile family from which the focused three are as follows [1-3].

–   XP (eXtreme Programming)

–   Scrum

–   DSDM (Dynamic Systems Development Method)

XP (eXtreme Programming): XP is one of the member methods of agile family it helps for being responsive to changing customer requirements and improving quality of software it is because it supports programming in pairs and extensive code review. XP teams work in one or two week long iteration and strictly follows priority order which is prioritized by customers. Also it allows changes in the features that are not started working till that time during a single iteration [8,9].

Scrum: Scrum is another member method of agile family, it works on an iterative and incremental framework the iterations (called sprints) are two week to a month long [10]. It supports future enhancement and universal product development. In this method priority is set by customers but developers set the sequence in which they will develop the backlog items and it do not allow changes during a single sprint. This framework is best for developing and sustaining complex products [11].

DSDM (Dynamic Systems Development Method): DSDM is the member method of agile family it provides on-time and on-budget delivery of quality software, high-level project planning and scheduling is needed. It uses the MoSCoW prioritization of scope into must, should, could and won't haves to adjust the project deliverable to meet the stated time constraint. It re-assess priorities and ongoing project sustainability with the delivery of each increment.

Best agile method exploration

To find the appropriate results we surveyed different national and international software houses/companies, which varies in size i.e. some, are of small scale and medium scale and some are of large scale [12].

Also we focused to choose different types of software houses/companies on the basis of their deliverables e.g. five software houses out of eleven were product oriented, four were project oriented and two were IT service providers.

We targeted some facts during our research for getting fruitful results [13]:

•   Team size

•   Iteration length

•   On-time delivery

•   On-budget delivery

•   Effect on recourses

•   Effect on quality

•   Customer relationship

•   Productivity

•   Failure risk

For seeking the method suitable in almost every situation we deeply analyzed the received responses and gave them scores on the basis of conversed targeted points given above and got the simple average result, the details of analysis with respect to these three methods are given below:

a. XP

Although we all know XP is pretty much responsive to changing customer requirement it allows us to change any business function requirement during iteration length in which it scheduled to be completed if it is not started yet this will help in providing a good quality software and maintaining a better customer relationship but it increases difficulty of work load (i.e. to work with a small team is difficult to manage) which directly effect on time, budget and resources and improved the failure risk, this results decrease in productivity of that firm and it usually used by small scale firms. According to the response we got form our survey, XP got 4 points out of 10 [8].

b. Scrum

Unlike XP, Scrum does not allow customers to change requirements when a function is about to start during iteration period but it helps in reducing failure risk and provides a successful working product delivery on-time and on-budget. In scrum single sprint time is two weeks to a month is helpful in working on complex modules. One of the most significant feature of Scrum is that it supports highly flexible or universal product making which helps in delivering a quality product and results increase in firm's productivity [11,12].

S.NO	Name	Type	Size	Projects
1	Engro Corporation Ltd	Product Oriented	Large scale	Food and Dairy Products
2	IBM	Product Oriented	Large scale	Hardware products
3	SidatHyder	Product Oriented	Medium scale	Management Systems
4	Gameview	Product Oriented	Medium scale	Gaming Software on different Platforms
5	Keystone Software Solutions	IT Service Provider	Medium scale	Business and Accounting Software and Services
6	ZeptoSystem (pvt) Limited	Project Oriented	Medium scale	Websites, Database and Mobile Development
7	TPS Pakistan	Project Oriented	Large scale	Cards and Payment Solutions
8	Samsung	Project Oriented	Large scale	Mobile Hardware and Software
9	Workforce	Project Oriented	Small scale	Desktop and Mobile Software, ERPs, etc.
10	Intelligentsia Software Ltd.	Project Oriented	Medium scale	Different types of software and IT services
11	Sunbonnet	IT Service Provider	Small scale	Cloud and Mobile Applications, Business Solutions, etc.

Table 1: Software Houses/IT Companies.

Method Name	Scores out of 10
XP	4
Scrum	9
DSDM	6

Table 2: Methods of product.

According to our survey many companies are using this method and Scrum got 9 points out of 10.

c. DSDM

DSDM supports a firm to deliver on-time and on-budget quality software but it needs very high level planning and scheduling which take too much time to start working on product, its monolithic and inflexible data structure is not appropriate in providing a universal product [14]. Implementation of this method is quite costly it requires users and developers to be trained for adopting this method and due to these limitations it is not commonly used in small scale firms. According to our survey only large scale firms are practicing this method and DSDM got 6 points out of 10 [15,16].

Result

Discussing the above facts gathered from the survey we got following scores which help us to determine which one is the most convenient method for almost every type of product, project or service to be delivered (Table 2).

In the light of above mentioned scores we conclude that Scrum is most convenient and suitable in delivering best quality product with in the given time and budget and helps in decreasing failure risk and increasing productivity and many companies are practicing scrum nowadays.

Conclusion

To summarize our main outcomes, around respondents who are using Agile Software Development methods, with the help of these responses we observed what are the effects of these methods on different firms [17,18]. Many firms are in favor of agile methods due to quick releases, improved communication between team members and the flexibility of design. Finally we conclude that scrum is the best in the above three and in practice by many firms.

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