

Resource Planning Using Agile Methodology - Corporate Case Study

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Abstract - Corporate resource planning is viable to dynamic changes in business as well as technological constraints. The methodology chosen must incorporate on demand needs arising. Agile methodology is gaining importance and is finding success in organizations because of the fastness that agile approaches bring in the software development life cycle. Scrum is one of the well-known agile software development methods. These methodologies are increasingly being used to develop software using an adaptive approach rather than a predictive approach. The main objective of the research is to analyze the work of an employee in an organization and give them ratings according to their work. This helps in identifying the strengths and weakness of each employee involved in the scrum.

Index Terms— Agile methodology, scrum, storey.

I. INTRODUCTION

Over the past 15 years [1], there is a drastic change in the way we develop software. The software development processes has evolved from Waterfall, to prototyping, to iterative, to spiral, to incremental, to rapid development, to extreme programming, to agile, to agile with scrum. Agile software development is a group of software development methods in which requirements and solutions evolve through collaboration between the clients and the project teams. It promotes adaptive planning, evolutionary development, early and predictable delivery [2]. The main focus of agile methodology is on customers and business values, encourages rapid and flexible response to change and improved quality. The agile methodology is favorable due to improved communication between team members and quick releases.

In a software development process the development team assumes that all the requirements gathered are complete and assumes that the project can be delivered in a successful manner, but now a day this is not true in most of the cases. The agile methodology [2] was introduced to overcome the changing organizational business requirements. At present this is an emerging field of software engineering as it supports requirement gathering. The major advantage of agile methodology is that it reduces major refactoring [3] and retesting.

The Agile Methodology is used for a project to build the product in a faster and effective way. The Agile scrum is a methodology which is commonly used for supervision the projects. The aim is to develop the new project in a time and cost effective manner. The Agile method introduces new cycle such as sprint and scrum meeting. A sprint referred as the progress of the product in two to three weeks consecutively. The analyzed requirement will be stored in the Product Backlog. The specialty of the agile methodology is self organization in teams.

Scrum is a software development methodology where the development team works as a unit to reach a common goal. Some of the important terminologies associated with scrum methodologies are

- The Product owner – the person responsible for representing the stakeholders interests and needs.
- Sprint – the work cycle for the development process usually in weeks.
- The Development team –group of people responsible for delivering the product.
- Scrum master – the main head responsible for organizing the scrum processes.
- Scrum team – the product owner, the scrum master and the development team comprises of the scrum team.
- Stand up meetings – the meeting takes place on daily basis and are sometimes called as scrum. The discussion is about the development and discussion is about.

The motivation for the research is that the traditional software methodology has many pitfalls in analyzing the employees work individually. While considering a huge firm the team managers finds it difficult to keep track of individual employee work, agile methodology helps to

overcome this drawback and cluster each employee based on their performances.

II. RELATED WORK

The software development is a process to result a particular product or software. This development is ideally planned and perfectly structured for the perfect growth. In the existing methodology modification is quiet difficult, once the project starts especially during the testing and application stage, it is almost impossible for large projects which includes high expenses. The customers will not be included in any of the stage even if there are some changes to be done.

A product needs the customer satisfaction always. The customer satisfaction has more priority than the time or cost in the development process. The traditional methodology has the problem of completing the project in less time and in an optimistic way. Agile methodology focuses on customer acceptance and his satisfaction wherein the development process is done in iterations. Some of the difficulties that emerged at the early years of software development [2] are

- Evolving requirements
- Customer involvement
- Deadlines
- Budgets
- Miscommunications
- Customer dissatisfaction

III. PROPOSED SYSTEM

The common problem that was noted with software projects was communication. The larger the project the greater this problem becomes. Clearly the larger projects mean the more people have to communicate because these projects takes more time for completion, information generated at the early stages of the project has to be recorded so that later stages of the project can access it. It is easy for such information to be incomplete or simply out of date. One response to this has been to make communication more formal and structured. An alternative approach is to reduce the length of lines of communication and the time information has to be stored. Wherever possible, communication is made directly between the scrum team. Outcomes are immediately incorporated into the software and tested, allowing feedback on the

implementation of agreed requirements to be generated quickly. Thus a representative of the users is actually a part of the team and can elucidate requirements on the spot. The requirements are documented on cards which contain stories that describe the required features of the software. Within the increments new features are integrated into the overall product at very frequent intervals and are immediately integration tested. If there is any error in the new version of the software component; there is an immediate fallback to the previous version while the problems are corrected. Each employees work is analyzed and accordingly they are rated.

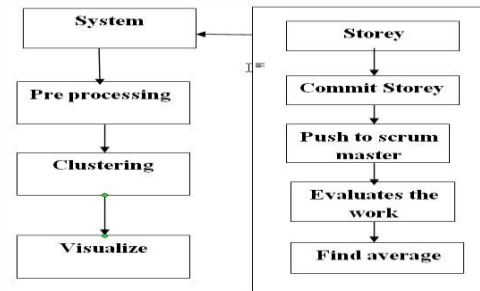


Figure 1: Architectural Diagram

IV. ALGORITHM

The Clustering algorithm is used to rate the employees.

Clustering is a process of grouping the data in such a way that data with similar characteristics fall under one group. Cluster analysis is an iterative process of knowledge discovery or interactive multi-objective optimization. The main goal is to group similar objects together. The greater the similarity within a group, the better the results of clustering and greater the difference between group the more diverse the clustering. Here we propose a novel algorithm for calculating the score of each employee and give them ratings accordingly. The mathematical model proposed includes

$$M = (T, N, D, S, R)$$

M is the mathematical model with five tuples

T: the threshold value calculated for the cluster

G: Centroid of the cluster

N: number of clusters

D: distance from centroid to cluster.

S: value assigned for each storey.

R: ratings given.

Step 1: sum up all the scores of each employee between the time periods.

Step 2: Calculate the points earned and compare it with total points and calculate the percentage.

Step3: identify the parameters for the calculating the threshold.

Step4: check every record with the threshold.

Step5: perform clustering.

Step6: if the points vary too much from the threshold then assign it to a new cluster.

V. METHODOLOGY INVOLVED

Agile is comprised of different methods, some of the well known agile software development methods include

- Adaptive software development(ASD)

Waterfall approaches has been replaced by adaptive software development with a repeating series of speculation, collaboration, and learn cycles. The advantage is that it provides continuous learning and adaptation to the emergent state of the end product. This type of development is feature driven and iterative. And focuses on fixed time and can tolerate changes.

- Agile Modeling(AM)

Agile modeling is a best practice for modeling and documenting software systems. The methodology includes a set of principles and values that can be used to develop software in a successful manner. Agile modeling is a part of agile software development tool kit and is more flexible for the changing environment.

- Agile Unified Process(AUP)

Agile Unified Process is a simpler approach for developing business application software using agile techniques.

- Crystal Clear Methods

This is a lightweight methodology which includes 6 or 8 members in a team. Crystal clear ensures safety of the product and frequent release of codes .The customer is the main focus.

- Disciplined Agile Delivery(DAD)

Disciplined agile delivery is an hybrid agile approach and is a process decision framework that enables simplified process decisions around incremental and iterative solution delivery.

- Dynamic Systems Development Methods

DSDM follows iterative and incremental approach used for developing software and non it solutions and includes continuous customer involvement.

- Extreme Programming(XP)

Extreme Programming is a technique to develop high quality software and also to meet the changing customer needs and ensures frequent releases in short time period.

- Feature Driven Development(FDD)

FDD focuses on delivering the tangible software on time. It incorporates a number of best practices that has been recognised by the industry.

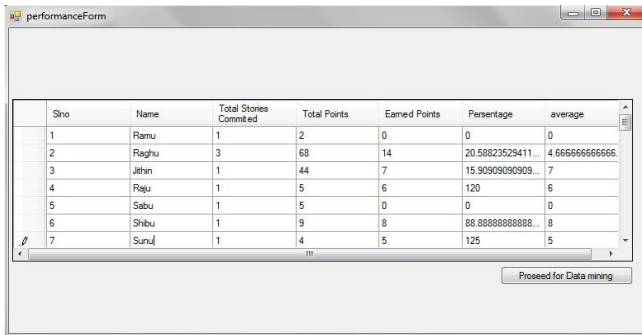
- Scrum

Scrum is a software development methodology where the development team works as a team to accomplish the work successfully.

VI. EXPERIMENTAL RESULTS

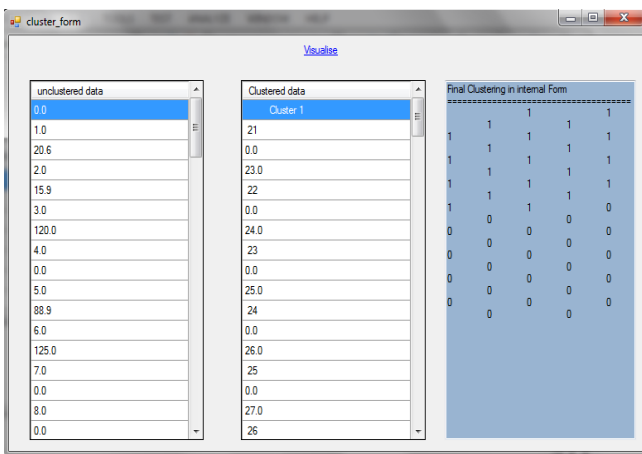
The scrum master creates storeys and assigns a value for each storey. A storey is a work assigned to each employee. Employees commit the storeys and works on it and once it is completed it is then given to the scrum master. Scrum master evaluates the employees work and based on their performance assigns scores to each employee. The work done by each employee between a time periods is summed up and the percentage is gained. Based on this percentage clustering is done. According to the overall performance each employee falls into different clusters. Based on the threshold the employees fall into different categories.

Once the clusters are formed it is then visualised in the form of chart using visualization technique.



Sino	Name	Total Stones Committed	Total Points	Earned Points	Percentage	average
1	Ramu	1	2	0	0	0
2	Raghu	3	68	14	20.58823529411...	4.666666666666666
3	Jithan	1	44	7	15.90909090909...	7
4	Raju	1	5	6	120	6
5	Sabu	1	5	0	0	0
6	Shibu	1	9	8	88.88888888888...	8
7	Sunil	1	4	5	125	5

Figure 2: Result after calculating the percentage.



unclustered data	Cluster 1	Final Clustering in internal Form
0.0	21	1 1 1 1
1.0	0.0	1 1 1 1
20.6	23.0	1 1 1 1
2.0	22	1 1 1 1
15.9	0.0	1 0 0 0
3.0	24.0	0 0 0 0
120.0	23	0 0 0 0
4.0	0.0	0 0 0 0
0.0	25.0	0 0 0 0
5.0	24	0 0 0 0
88.9	0.0	0 0 0 0
6.0	26.0	
125.0	25	
7.0	0.0	
0.0	27.0	
8.0	26	
0.0		

Figure 3: Clustered data

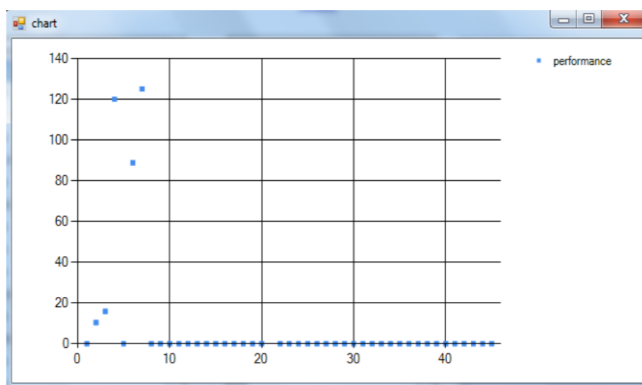


Figure 4: Representation in the form of chart showing the performance of the employees.

VII. CONCLUSION

It is important that for a project that it is successfully completed in an optimistic manner. The Agile methodology helps for that. Agile method is the fastest method of software development. Agile methodology mainly focuses on increasing the agility and flexibility of software products. The use of agile methodologies differs from company to

company. Agile methodologies are increasingly being used because it ensures short term releases. It also focuses on the customer involvement by taking their feedbacks and suggestions and helps in developing high quality bug free software.

REFERENCES

- [1] Malik Hneif, Siew Hock Ow, Review of Agile Methodologies in Software Development, International Journal of Research and Reviews in Applied Sciences ISSN: 2076-734X, EISSN: 2076-7366 Volume 1, Issue 1(October 2009) .
- [2] Kuda Nageswara Rao, G. Kavita Naidu, Praneeth Chakka, A Study of the Agile Software Development Methods, Applicability and Implications in Industry, International Journal of Software Engineering and Its Applications Vol. 5 No. 2, April, 2011.
- [3] Naresh Kumar Nagwani, Pradeep Singh, An Agile Methodology Based Model For Change Oriented Software Engineering, International Journal of Recent Trends in Engineering, Vol 1, No. 1, May 2009.
- [4] Kaushal Pathak, Anju Saha, Review of Agile Software Development Methodologies, International Journal of Advanced Research in Computer Science and Software Engineering, Volume 3, Issue 2, February 2013 ISSN: 2277 128X.
- [5] Deepa Vijay and Gopinath Ganapathy, guidelines to minimize the cost of software quality in agile scrum process, International Journal of Software Engineering & Applications (IJSEA), Vol.5, No.3, May 2014.
- [6] Andrew Begel, Nachiappan Nagappan, Usage and Perceptions of Agile Software Development in an Industrial Context: An Exploratory Study.
- [7] Karen Ascheim Wysopal, QA Role in Scrum Leveraging Agile for Defect Prevention.
- [8] Jan Segers, Analysis of a paper- and software-based Scrum task board, Business Information Technology MSc Thesis. Enschede, September 2012.
- [9] Ken Schwaber, SCRUM Development Process, Advanced Development Methods 131 Middlesex Turnpike Burlington, MA 01803
- [10] Igor Ribeiro Lima, Tiago de Castro Freire, Heitor Augustus Xavier Costa, Adapting and Using Scrum in a Software Research and Development Laboratory, Revista de Sistemas de Informação da FSMA n. 9 (2012) pp. 16-23 .

- [11] Laurie Williams, Gabe Brown, Adam Meltzer, Nachiappan Nagappan, Scrum + Engineering Practices: Experiences of Three Microsoft Teams.
- [12] Scott W. Ambler, Going Beyond Scrum Disciplined Agile Delivery, White Paper Series, October 2013.
- [13] Julio Ariel Hurtado Alegria, Maria Cecilia Bastarrica Alexandre Bergel, Analyzing the Scrum Process Model with AVISPA.
- [14] Arjan Aarnink, Gijsbert Kruithof, Contribution of Agile Software Development Methods to Business-IT Alignment in Non-profit Organizations, Contribution of Agile Software Development to Business-IT Alignment in Non-Profits.

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