A Study of the pertinence of Crowdsourcing in Agile Software Development

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Abstract **-** Crowdsourcing is a prominent form of externalization software development. The Crowdsourcing, in the field of several leading models of organizing work, has reconstructed the way; the agile software's are being developed. The article covers up the panorama of Crowdsourcing in Agile Software Development, by emphasizing on the key motivations for engaging, and also highlights some of the major challenges that lie ahead. We examine whether the task presently projected on crowd-sourcing platforms having the requisite qualities for agile software development. The utmost crucial task is to, find a large figure of adequate issues to evaluate a technique in Agile Software Development In this work we explore the use of crowdsourcing as a mechanism to confront that challenge by assisting in Agile Software Development. In this recommendation, we try to scrutinize both-
(i) The Crowdsourcing platforms, which are more appropriate to Agile Software Development, among the existing ones. (ii) The Kind of task which are more relevant of Crowdsourcing in Agile Software Development. More specifically, through this work we have surveyed various factors under which both methodologies can be combined, to create a new product, increase the efficiency and provide better outcomes and services.

Keywords- Crowdsourcing; inclusive documentation;

I. INTRODUCTION

Software engineering is creative and ever evolving gives the procedure and method to be pursued in the software development and react as a backbone of computer science engineering techniques. Software Development is a methodical and well-ordered process that flourishes to provide products in a swift, superior and affordable manner. Software has merged into many diverse fields, and is becoming more complicated. Changing requirements from customers is making it even more difficult. Previous software development methods are not capable to satisfy the growing and advanced requirements of the market in the best possible way. Therefore, new software development approaches have been developed, such as agile software development methodologies, mainly to solve such problem.

Agile Software Development (ASD) is rather, an advanced approach in software engineering. Agile processes or development methods can be said to be a, pristine approach for planning and managing software development projects. ASD vary from conventional and established approaches, as it highlights more on mechanism for change management than on the up-front plans, during the project.

The founding principles of ASD are based on some existing ethics of software development, inspite of being a new approach, both from the field of software engineering, information system and others such as production management. We have analyzed the applicability of crowdsourcing in Agile Software development. We have pinpointed some papers in which organizations have used innovative Agile methods of software development under various situations application of big data and cloud computing have been extensively used in handling crowdsourcing. Traditionally big data technique has also been used for crowdsourcing development. As stated by Jeff House (2006), Crowdsourcing is a procedure of taking a job traditionally executed by a designated employee, and outsourcing it to an undefined, usually, large group of people in the form of an open call.

We have reviewed various leaven aging of new technologies creating more collaborative corporate culture and focusing on opportunity to differentiate the conventional methodologies.

II. LITERATURE SURVEY

Based on the literature review, we categorized numerous concerns related to crowdsourcing which are of great importance in rapid and flawless software development process. The paper by Thierry Buecheler, Jan HerikSeig, Rudolf M. Fuchslin and Rolf Pfeifer [1], clearly explain how nonprofit "Research Value Chain" can definitely enjoy advantages of Crowdsourcing. Research analysis was given which explains a) how crowdsourcing can be applied to fundamental science and b) the effects of results of Artificial Intelligence research on vigorousness of Crowdsourcing. Conclusions and results from different research series will be merged, for instance, Complex or Versatile networks. The research and works of Eddy Maddalena, Vincenzo Della Mea, Stefano Mizzaro[2] , enlightens the possibilities that if a task proposed on crowdsourcing platforms is appropriate two

mobile devices. Our prior motive is to analyze that(i) which of the preexisting crowdsourcing platforms are more compatible to mobile devices, and (ii) what sort of the application of Crowds explain the use of crowdsourcing in educational activities. In this paper[3], "The application of Crowdsourcing in educational activities", explain the use of Crowd Sourcing in educational activities. With the growing time, the Boom in Information and Communication Technologies via Internet and duration a wide range of options for these organizations to accomplish their objectives. Hence the soul motive of this paper is to give up brief explanation of how education organizations have opted crowdsourcing as part of their activities in the current scenario time to explain how use of outsourcing would be soon spread to other educational activities with the passing time. Andre Vn Hoek's [4], "Crowdsourcing in Software Engineering, Models, Motivations and Challenges" is about software engineering, the crowd, and the possibility that if these advantages can be included in a software or not. Till date, these imaginative examples are not yet practically applicable but crowdsourcing has definitely started developing a place in software development field. The paper [5],"Reactive Crowdsourcing", by Alessandro Bozzon, Macro Brambilla, StafanoCeri, Andrea Mauri proposers and approach to Crowd Sourcing which provides find level, powerful and ex-controls. We initially design is crowdsourcing application as a blend of elementary task types. Further, we convert these hi-tech specifications into the features of a reactive execution environment which supports planning, execution and termination of a task and performer analysis as well. Controls are fixed as active rules in data structures which are obtained from the design of application. These rules can be removed, had it or altered as per requirement which ensures highest efficiency with the lowest efforts. The paper by Kathryn T. Stolee, Sebastian Elabaum[6], investigate the use of crowdsourcing as a process to address that challenge by helping in subject recruitment. Further, to be more precise, with the help of his work we can express how study can be performed under infrastructure that ensures the possibilities to approach a large base of uses and also allows managing those users while the study is being carried out. We discuss the observations and results of this experience which explains the capabilities and potential of crowdsourcing software engineering studies. Rajan Vaish[7], has introduced a research direction which illustrates the possibilities of expert outsourcing by Linking mentor with student crowd. This process will allow mentors to comprehensively used operators such as split commerce, remove or add on project ideas, cord on studying to daddy suit on project ideas, code or students to carry out research. The research procedure will include numerous stages like brainstorming, paper-pencil prototyping, and development and user evaluation to produce publishable results. Encouraged by prior pilot experiment findings, my doctoral research examines the possibility of crowdsourcing the research process using operators along the research stage, while solving resource and opportunity constraints among mentor and crowd. We are inspired by the work of Bernardo A. Humberman[8], research of a huge data set from YouTube that the efficiency exhibited in crowdsourcing provides a strong positive dependence on attention which is calculated by number of downloads. On the other hand comma unavailability of a tension leads to decline in quantity of videos uploaded that further leads to decline in productivity, weights in some instances leads to know uploads at all. Moreover part-time contributors compare their performance to that of an average contributor whereas the long-term contributors compared to their own media. Research paper by Hanning Yuan, Yanni Han, Jun Hu[9], proposes a nimble development procedure of service-oriented software for a research perspective. Primarily, the history of software development procedure is viewed while focusing on the controlling forces of software technology. Furthermore, we observed the software services efficiency, increased by the user-driven needs in network environment. Then the nimble development procedure is proposed based on users' individual requirements and priorities comma which is a "meet in middle" way of software development. As it is controlled by users' personalized needs, this method can be presented as a blend of service resources on demand and approach to the target slowly. Hence, it turns out to be an efficient way to meet rapidly increasing application software requirements. Tom Narock and Pascal Hitzler[10], suppose that implementing search algorithms with crowdsourcing can prove to be a reliable solution. To be precise, they observe Big Data within the geosciences and describe great questions regarding the merger of crowdsourcing and semantics. They present the work that is being carried out in this area and discuss directions for future research. De created a Crowd Sourcing portal that allows people of the jio science community to link their conference presentations and funded grant descriptions to the Database used in those projects. Input from the user is converted into RDF and these links are plotted in subsequent data Discovery tools. The links needed in the process are difficult to generate automatically due to a limited and specific information in the available data sets (e.g. no reference to data set used on inconsistencies in the researcher's name along the datasets). Although, contadictory to the most "Crowd" is compromised of professional researches and not the ordinarily lot. This gives birth to new challenges, in stimulating the crowd, and arousing trust. Rashmi Popli, Naresh chauhan[11], cast the spotlight on the research work in Agile Software Development and estimation in Agile. They recommended a technique for the accurate cost and effort estimation, to escape from the problems of current agile practices. Based on the concepts of adaptability and flexibility, the Agile methods, represent an emerging set of softwares, are

currently used as a gimmick to these reoccurring problems and make but a clear way for the future of development.

Emal Altameem[12], explains several methods , in which Agile methodology has been, proved to be influential in software development. It also elaborates the advantages and the restrictions of Agile Technique. This paper motivates developers, to adopt this technique, so as to develop software that proves out to be a remedy for their changing needs. Gaurav Kumar, Pradeep Kumar Bhatia [13], recognized the significance of this methodology, in terms of its quality within the cultural framework. Kuda Nageswara Rao, G.Kavita Naidu,Praneeth Chakka[14] paper, A study of the Agile Software Development Methods, Applicability and Implications in Industry, has been executed with the factual intentions of examine and gain acuity. Into, the latest agile concepts and Techniques, distinguishes between the strengths and weaknesses of agile methods and various issues regarding their applicability. Wenjun Wu,Wei-Tek. Tsai[15], examine the data in detail , gathered on software Crowdsourcing and abbreviates major lessons,learned, then analyse two Software Crowdsourcing processes, including artistic ways. Preeti Rai, Saru Dhir[16],elucidate the influence and comparison of several traditional techniques and a new methodology. Top Coder and App Storiprocesses. Concludingly, they identify the min-max nature among participants as a crucial element of design in software Crowd-Sourcing for software quality and investigate the reasons for which software industries, shifted from Traditional RE to Agile RE. Gaurav Kumar, Pradeep Kumar Bhatia [17], recognize the fact agile methodology has a remarkable impact over software development processes with respect to quality, within the organizational, methodical and cultural framework. Kiran Jamaalamadakal, V. Rama Krishna [18], emphasize on few confrontations with Agile->scrum and gives vision to the user whether the Agile is WONDER DRUG. Malik Hneif, Siew Hock Ow[19], showcase their review over three Agile approaches including Extreme programming, Agile Modeling, and scrum distinguishes between them and advice, when to use them. Gurleen Singh, Tamanna[20], reviews various agile techniques like on their characteristics, objectives, boons and banes of using agile methodology and their unique characteristics.

III. RESEARCH GOAL

Crowdsourcing (distributed problem - solving model) is an emerging concept within software engineering research, based on the combination of human and machine computation.

Crowdsourcing is a form of collective intelligence, the general idea being that the actions of several individuals can result in the emergence of information processing. The consideration of the forces that drive the current emergence of the current crowdsourcing models, platforms, and environments, particularly in terms of their use in software development organizations is quite engaging and interesting. Many of the models are novel, and their drawbacks, and corresponding advantages are not understood really well. However, businesses should see the tangible benefits in adopting and using the process of crowdsourcing, even if not to a great extent.

In this article, we review the various motivations that drive software organizations to adopt the crowdsourcing process, along with the forces motivations the developers to take part in these activities. Agile methodologies came into existence after the need for a easier or less complex way to do software development in order to meet changing requirements environment. Agile methodologies provide some practices that facilitate communication between the developer and the customer, and undergo develop-delivery-feedback cycles, to have more clear and exact view of the requirements, and be ready for any kind of updation at any point of time. The main aim of agile methodologies is to deliver what is needed at the right time. The Agile Scheme emphasizes majorly on the following-

(i). Individuals and intercommunications over processes and tools.

(ii). Working Softwares over inclusive documentations.

(iii). Consumer partnership over contract negotiation.

(iv). Responding to change over following a plan

We observe by studying that, we can apply extreme programming an agile software engineering concept in crowdsourcing. This can be done by expanding the principle of Myers-Briggs personality traits in analyzing the proper team and another phase can be deals with identification of requirement in a crowdsourcing.

IV. CONCLUSION

Crowdsourcing has already changed the current software development scenario through its various forms. Open source aside, the number of pristine Crowdsourcing platforms, the no. of corporations actively evaluating with Crowdsourcing, the number of employees signing up and continually contributing indicate, a process that have stepped in the software development industry through innumerable ways. The probable supremacies of adopting the crowdsourcing practices are concrete. The increment in the shift of development, work more dramatic shifts and occurrence to fluid labor markets alone, and does prognosticate the potential for even. Such shifts might raise a much awaited question and suspect the long-held fundamental beliefs about the software development practices, as in any fundamentally disorderly shift, the eventual spin-off are far from being particular. Now the question of the hour is that, will future developers be half-witted automatons, or will they be operating as qualified workers and freelancers, choosing micro tasks to follow their passion and enhance their skills Serious challenges have to be undertaken, if Crowdsourcing is going to be that impactful in software industry, as it has proved to be in other industries.

The nature of software has much to do with this aspect. Software Development is compounded and intricate, and cannot be easily decoded into distinctly segmented, self-contained and is not easily comprehended. Evolving an extensive cognizance of how and when to apply Crowd-Sourcing in Software development projects is valuable for the Community. Crowdsourcing has been used as a technique to process some important works within agile software development. Crowdsourcing as a sourcing strategy, very less research exit; whereby the real development of agile software is crowdsourced and clubbed into a final product. Studies of crowdsurcing agile software development can also be used to combine two or more concept to produce research findings. This research can be used to conduct hereafter exploration on the utilization of crowdsourcing like a sourcing tactics.

V. REFERENCES

[1]. Thierry Buecheler, Jan Henrik Sieg, Rudolf M. Füchslin1 and Rolf Pfeifer, "Crowdsourcing, Open Innovation and Collective Intelligence in the Scientific Method: A Research Agenda and Operational Framework", Artificial Intelligence Laboratory, Department of Informatics, University of Zurich.

[2]. Vincenzo Della Mea, Eddy Maddalena, Stefano Mizzaro, "Crowdsourcing to Mobile Users: A Study of the Role of Platforms and Tasks", DBCrowd 2013: First VLDB Workshop on Databases and Crowdsourcing.

[3]. Monika Skaržauskaitė "The application of crowd sourcing in educational activities", ISSN 2029-7564 (online) SOCIALINĖS TECHNOLOGIJOS SOCIAL TECHNOLOGIES 2012, 2(1), p. 67–76.

[4]. André van der Hoek, "Crowdsourcing in Software Engineering Models, Motivations, and Challenges", Focus: The Future of Software engineering.

[5]. Alessandro Bozzon. Marco Brambilla, Stefano Ceri, Andrea Mauri, "Reactive Crowdsourcing", Dipartimento di Elettronica, Informazione e Bioingegneria – Politecnico di Milano Piazza Leonardo da Vinci, 32 – 20133 Milano, Italy

[6]. Kathryn T. Stolee, Sebastian Elbaum, "Exploring the Use of Crowdsourcing to Support Empirical Studies in Software Engineering", Department of Computer Science and Engineering University of Nebraska – Lincoln, NE, U.S.A.

[7]. Rajan Vaish, "Crowdsourcing the Research Process", University of California at Santa Cruz1156 High Street, Santa Cruz, California 95064, USA

[8]. Bernardo A. Huberman, "Crowdsourcing, attention and productivity", Social Computing Lab, HP Laboratories, Palo Alto, CA, USA.

[9]. Hanning Yuan, Yanni Han, Jun Hu, "Research on Agile Development Methodology of Service-Oriented Personalized Software" published by IEEE xplore ,2008 International Conference on Computer Science and Software Engineering.

[10]. Tom Narock and Pascal Hitzler "Crowdsourcing Semantics for Big Data in Geoscience Applications", Semantics for Big Data AAAI Technical Report FS-13-04.

[11]. Rashmi Popli, Naresh Chauhan, "Cost and effort estimation in agile software development", published by IEEE 2014 International Conference on Reliability Optimization and Information Technology (ICROIT).

[12]. Eman A.Altameem, "Impact of Agile Methodology on Software Development" published by Computer and Information Science; Vol. 8, No. 2; 2015 ISSN 1913-8989 E-ISSN 1913-8997 Published by Canadian Center of Science and Education 9.

[13]. Gaurav Kumar, Pradeep Kumar Bhatia,"Impact of Agile Methodology on Software Development Process" published by International Journal of Computer Technology and Electronics Engineering (IJCTEE) Volume 2, Issue 4, August 2012.

[14]. Kuda Nageswara Rao, G. Kavita Naidu, Praneeth Chakka, "A Study of the Agile Software Development Methods, Applicability and Implications in Industry", published by International Journal of Software Engineering and Its Applications Vol. 5 No. 2, April, 2011.

[15]. Wenjun Wu, Wei-Tek Tsai, "Creative software crowdsourcing: from components and algorithm development to project concept formations", published by Int. J. Creative Computing, Vol. 1, No. 1, 2013.

[16]. Preeti Rai, Saru Dhir, "Impact of Different Methodologies in Software Development Process" published by , International Journal of Computer Science and Information Technologies, Vol. 5 (2) , 2014.

[17]. Gaurav Kumar, Pradeep Kumar Bhatia,"Impact of Agile Methodology on Software Development Process" published by, International Journal of Computer Technology and Electronics Engineering (IJCTEE) Volume 2, Issue 4, August 2012.

[18]. Kiran Jammalamadaka1, V Rama Krishna, "Agile Software Development and Challenges" IJRET: International Journal of Research in Engineering and Technology. ISSN: 2319-1163, ISSN: 2321-7308 Volume: 02 Issue: 08 | Aug-2013.

[19]. 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).

[20]. Gurleen Singh, Tamanna ,"An Agile Methodology Based Model for Software development", published by, International Journal of Advanced Research in Computer Science and Software Engineering Research Paper, Volume 4, Issue 6, June 2014.

[21]. Himanshu Pandey, V. K Singh"Coalescence of Evolutionary Multi-Objective Decision making approach and Genetic Programming for Selection of Software Quality Parameter "published by "International Journal of Applied Information System 7(11):18-22, November 2014. Foundation of Computer Science, New York, USA

[22]. Himanshu Pandey, "Develop Framework for selecting best Software Development Methodology" published by "International Journal of Scientific and Engineering Research". Volume 5, Issue 4, April 2014.

[23]. Himanshu Pandey, "A Literature Review of E- Learning Model Based on Semantic Web Technology" published by "International Journal of Scientific and Engineering Research" Volume 5,Issue 10, October 2014.

[24]. Himanshu Pandey, Neeraj, "A new approach for NFA minimization*"* published by "International Journal of Applied Information Systems (IJAIS)" – ISSN: 2249-0868 Foundation of Computer Science FCS, New York, USA Volume 8– No.3, February 2015 – www.ijais.org.

[25]. Himanshu Pandey, Amit,"LR Rotation rule for creating Minimal NFA" published by "International Journal of Applied Information Systems (IJAIS)" – ISSN: 2249-0868 www.ijais.org.
[26]. Himanshu Pandey, V.K Singh, "New Assumption of Cognitive Model for Information Foraging on Web" published by International Journal of Advances in Engineering & Technology, Apr., 2015. ISSN: 22311963.
[27]. Himanshu Pandey, V.K Singh "A Fuzzy Logic based Recommender System for E-Learning System with Multi-Agent Framework" published by "International Journal of Applied Information Systems (IJAIS)" – ISSN: 2249-0868 Foundation of Computer Science FCS, New York, USA Volume 122(17):18-21, July 2015 – www.ijais.org.
[28]. Himanshu Pandey, Manuj Darbari, "Estimation of Maintainability in Object Oriented Design Phase: State of the art" "International Journal of Scientific and Engineering Research" Volume 6, Issue 9, September 2015.
[29]. Himanshu Pandey, V.K Singh "Web Mining for Personalization: A Survey in the Fuzzy Framework published by "Asian Journal of Computer and Information System" (ISSN : 2321- 5658).