Effectiveness of C^6T and W^5H in Lean documentation

T. Hari Kumar
Research scholar
Department of Computer science & technology
Sri Krishnadevaraya University Anantapuramu
hari.kumaratp@gmail.com

Prof. C. Uma Shankar (Registrar – RSV, Tirupathi) Department of OR & SQC, Rayalaseema University, Kurnool cumaor@rediffmail.com

Dr. S. Kiran
Assistant Professor,
Department of CSE.
YSR engineering college of Yogi Vemana University, Proddatur.
rkirans125@gmail.com

Abstract: In the Evaluation of software development, Lean is oldest organizational methodology. To improve the performance Lean is having various versions. Documentation plays key role in estimating the performance of project. It is also having features like reorganization of development system. This paper focuses on drawbacks of documentation regarding lean methodology. Documentation will give clear vision and goals of product. To enhance the features of documentation C^6T and W^5H principles are applied.

Keywords: *Lean, Performance estimation, Documentation, C^6T, W^5H*

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1. INTRODUCTION

All outstanding programming development projects, independent of practice, generate a lot of related documentation. A high degree of programming [5,8]method costs is realized in conveying this documentation. Moreover, if there are mistakes in documentation prepared could cause great faults in using the applications/programs by end users who are using the product. This could also lead subsequent system failures with their related costs and disturbance. In order to avoid this, managers and software architects should pay more attention towards preparation of documentation and its respective costs with regards to the quality development in building of software itself.

1.1 Why Document

1. To recognize in centric part of any system
2. Formalization [1] of contract model.
3. Enabling the effort for current goal.
4. Writing comments for code.
5. Architectural document needed to understand design.
6. Not to say "I feel it is appropriate".

The documents connected with a software development[2] and the systems being created have various related necessities:

1. It should act as medium of correspondence between people from the development team
2. Maintenance engineers need to maintain a common system data storage point.
3. It is essential to provide data properly in the document which guides to plan, estimate and model the development process of software.
4. For effective utilization of system, document is one of the part is used by end users.

The above fundamentals must be appeared as sets starting from casual functioning reports to professionally designed optimized client manuals. System architects generally responsibility in creating the greater portion of this documentation even though efficient specialized intellectual who may help with the last cleansing of remotely released data.

There are two kinds of documentation:

1. Process documentation: To update plans, models and quality related with development of product, process document plays a vital role.
2. Product documentation: The product document illustrates about the product which has to be developed. System documentation explains view of the product for designers. user documentation gives an item representation that is intended towards system clients. Further any change is needed for that product, appropriate operations has been executed, further, these developments are very crucial in system improvement by administrators.

1.2 Process Documentation

Effective administration requires the procedure being figured out how to be unmistakable. Since programming is elusive and the product procedure includes clearly comparative intellectual assignments instead of clearly diverse physical tasks, the main way this visibility can be accomplished is using process documentation [7].

Different kinds of Process documentation:

1. Scope, costs and schedule: The managers are responsible to create these records which are used to forecast and to control the product procedure.
2. Reports: The utilization of assets during the process of development was described in these documents.
3. Benchmarks: It mainly concentrates materialization of procedure. The criteria may vary from organizational, national or global.
4. Working papers: The thoughts and considerations of architects are recorded in working papers which break the documentation into different forms for execution systems and issues which are recognized are set out with working papers. This enhances

regularity, verifiability of document and also justifies outline choices.

5. Notices and electronic mail messages: These document the sophisticated components of common exchanges between managers and developers.

The significant normal for process documentation is that the majority of it gets to be obsolete. Arrangements might be drawn up on a week by week, fortnightly or month to month premise. Advancement will ordinarily be accounted for week after week. Notices record considerations, thoughts and aims which change.

1.3 Product documentation

The programming product which is qualified is illustrated by the product documentation. The product which is not having any condition considered as important process documentation[9]. Product documentation is concerned with illustrating the passed on programming product. It is having long life. It will create programming which interprets the product. The support engineer needs information respect with product and system document utilization.

1.3.1 User documentation

The clients using an end product are not same. The creator of documentation need to format it to provide input for various client assignments and various heights of aptitude and involvement. It is need to identify and administrators and end-users:

1. clients exploit the product in order to complete task. This will fly an helicopter, directing assurance game plans, writing a book, and so on. They have to know how the product can help them. They are not influenced by PC or organization sophisticated principles.

2. The management of product is accountability of administrators of a system with respect to clients. This may incorporate going about as a head if the system is an immense unified server system, as a system director of the system incorporates an arrangement of workstations or as a particular master who fixes end-users programming issues and who loses among clients and the product supplier.

Different types of User Documentation
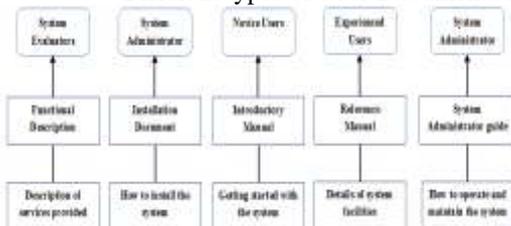
The Functional description of the system traces the system prerequisites and quickly explains the services provided. Users should have the capacity to peruse this document with an early on manual and choose if the system is the thing that they require.

The system installation document is expected for system administrators. It should give points of interest of how to install the system in a specific domain.

The introductory manual should exhibit a casual prologue to the system, describing its "typical" utilization. It should portray how to begin and how end-clients may make utilization of the basic system facilities.

The system reference manual should explain the system facilities and their utilization should give a complete posting of blunder messages and should portray the most effective method to recoup from identified blunders.

A more broad system administrator's guide should be accommodated some types of system, for example, command and control systems. This should portray the messages produced when the system interfaces with different systems and how to respond to these messages.

1.3.2 System Documentation

System documentation contains most of the documents illustrating the system itself from the scope to detail to the last affirmation test course of action. Documents explaining the outline, execution and testing of a system are key if the project is to be understood and kept up. Like user documentation, it is important that system documentation is to be standardized, with blueprints driving according to client into more formal and point by point description of all aspects of the system.

The System Documentation should contain:

1. The essential documentation and a related strategy for thinking.
2. A document illustrating the design of the system.
3. The explanation of the plan of every project that is included in the system.
4. The importance of every part of the system, which explains its efficiency and integration.
5. The source code accounts: These clarifies complex area of source code and gives the reason why this kind of coding strategy is used. The significant names are used to organize style of programming in significant fashion to record without any further requirements. The data must be maintained digitally on interest of user.
6. The project approval has been done by identifying necessary data and records.
7. The support guide for system describes how equipment and subordinates advances the system as a outline.

1.4 Documentation Standards

Documentation Standards go about as premise for document quality[4] affirmation. Documents delivered by standards have a steady appearance, structure and quality. Notwithstanding, it is not just standards that emphasis on documentation that are significant. Different standards that might be utilized as a part of the documentation procedure are:

1. Process standards:
   These standards characterize the procedure which should be followed for high quality document production. Process standards characterize the way

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to deal with be taken in delivering documents. This for the most part means characterizing the product instruments which ought to be utilized for document creation and characterizing the quality affirmation strategies which guarantee that excellent documents are delivered. Document process quality confirmation measures must be adaptable and must have the capacity to adapt to a wide range of document.

2. Product standards:

The product standards speaks out themselves and further applicable as guidelines for documents in entire development of product and similar to structured documents. These will apply further for all documents to draft basic customer documentation.

3. Interchange standards:

It is continuously needed to communicate document copies by method for electronic mail and to save documents in repository. Interchange guidelines that all electronic copies of documents are great. These standards are fundamental as more records are made in electronic association and furthermore or instead of on paper. For documentation that is passed on with a product development system, .PDF is presently typically used. The usage of Interchange guidelines, licenses documents to be exchanged electronically and re-made in their novel structure. The use of these standards, grants documents to be communicated electronically and re-made in their novel structure.

2. Difficulty in Document management

There is volumes of the data is available in modern development system. It is not possible to overwhelm the documentation in the process of execution and managing the product. In some critical situations the digital technology is unable to retrieve the data. The only way is to study the product details in documentation.

Particularly there exists a difficulty[6] in managing the documents such as

1. Document process
2. Wrestling with documentation
3. Over flowing
4. Trade secrets
5. Personal profiles of the company
6. Auditing and financial statements

To maintain above kind of data there is a need of good plan floor in creating and sharing of documents often involves a benchmark in business requirement.

3. Lean Documentation pitfalls

With respect to business requirements in product development there are some halts such as

1. Difficulty in understanding customer specifications
2. Unable to understand technical, environmental and economical facilities
3. Problem with respect to Quality control management
4. Unable to supply the document to all the persons

5. There exists a inequality policies and plans to specific group of employees
6. Lack of approval and review of document

The above documentation flow causes for enormous waste generation but it is not worst.

There is a need of greater concern in unauthorized access of documentation which causes for damage for the company. This unstructured nature of documentation causes for inefficient process. Lack of standard monitoring may cause sensitive information of organization thrown in to risk.

With respect to Lean[2,9], there is a inequality utilization of staff and systems. There is no transparency and collaboration between development organization and stakeholders. There is lack of security policies. There is lack of coordination in development team.

4. Effect of C^6T & W^5H principles in Lean Documentation

To enhance the Lean documentation process it is essential to carry out the C^6T and W^5H principles to avoid above said factors.

With respect to good understanding and smooth going of development in between members of development team the C^6T principles must to be followed.

1. Collaboration
2. Cooperation
3. Commitment
4. Coordination
5. Certainty
6. Communication
7. Trust

The Lean documentation must follow W^5H principles. Depending on the principals, to enhance the potentiality of development team the following documentations are mandatory.

1. Policies and security related issues documentation.
2. Design decision documentation.
3. Operational documentation.
4. Executive documentation.
5. Requirement documentation.
6. User documentation.

Why updating is required in documentation.

1. Requirement issues.
2. Design related issues.
3. Economical related issues.
4. Time bound issues.

The following Document security practices must be followed in Lean to achieve better way of document process.

1. Who
2. What
3. Why
4. When
5. Where
6. How

5. RESULTS:

The following metrics are evaluated for proposed method with respect to other methods like Traditional, Agile and

Lean. The performance metrics shows better result for proposed method compared with existing method.

The metrics[3] are number of errors, number of documents prepared for a project, total number of pages used to prepare documents in a project and number of resources used to prepare documentation
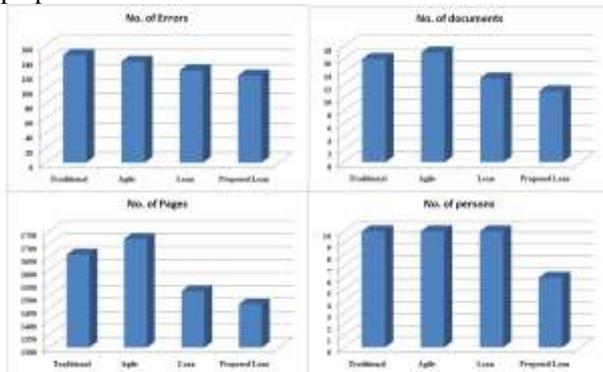
6. CONCLUSION

The primary concern of software development is to produce effective performance in product development. For this, various methodologies are existed. Lean in one of the methodology, which is originally initiated by Ford in later Lean has adopted as software development methodology. Along with Lean, various development strategies are available. The proposed paper concentrates a clear vision and goals for product regarding with documentation. Documentation features enhanced with two principles C^6T and W^5H. These principles are enhancing the documentation strategies compared with other methods. In future, some more principles are needed to enhance the design strategy of documentation.

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