An Ameliorated Methodology for The Design of Software Project Activities

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***Abstract*—Software development projects are needed to realize the vision, mission, and objectives of the projects. Nowadays these are used in project as ornamental. The project activities are developed ignoring the vision, mission, and objectives. Moreover the projects are developed based on managerial activities developed by Project Management Institute (PMI) the technical activities are abstracted from the byproducts of managerial activities, thus the software development projects neglected the current proven methodology for the development of the technical activities even there is no pari- passu between these two types of activities. Consider the importance of technical activities. This paper uses vision, mission, and objectives as strartificational grammar to identify technical activities and then attempts to blend them with managerial activities attaining equipollence between these two types of activities.**

Keywords*— *Technical activity, managerial activity, software project management, objectives;

I. INTRODUCTION

Vision: To eliminate embezzlement of managerial activities to generate technical activities.

Mission: To design and develop methodology for the abstraction of technical activities from the objectives and input feature and blend them with equipollent managerial activities.

Objectives:

- To develop technical activities through the establishment of correspondence between the semiotics of input feature and objectives.
- To form blend of equipollent managerial and technical activities.
- To develop the reticulation of activities for software projects.

A. Motivation

The Project Management Institute though have developed well defined managerial activities in the point value form of two dimensional pace viz., PLC and KA, it does not help to identify technical activities required for the software development. If the technical activities are derived from the table generated by managerial activities, there exist many pitfalls which we witness in the au-courant software development scenario. The recession in the software industries is a bottleneck in the utilization of software in all walks of life. The very purpose of managerial activities is to enhance the quality of technical activities; the technical activities should be in place. Most of the managerial are left for the expert judgment, it is an art. Technical activity is an engineer, art should be transferred into engineer via science but these are not possible as art is not stable, there is no unique art to develop the business process. The technical activities cannot be engineered with these types of volatile art, moreover the third pit fall is that both are dimensionally orthogonal to each other, which ruins either the bones of managerial activities or bones of technical activities. Therefore these are a derision of foppishness. So in this paper an attempt is made to develop the technical activities naturally the input for the technical activities are the input features and the objectives of the software, both are available in SRS. Therefore this paper attempts to enlighten the development of technical activities.

B. Literature Survey

The objective of the managerial activities is to enhance the quality of technical activities in [1]. Thus for the success of the project both types of activities should be carried out betwixt between each other. Therefore, technological activities are essential activities but there is no proper methodology for its identification and managerial activities are in place but they are well defined for general projects rather than the software projects. The PMI in [2] though has developed well defined managerial activities in the point value form of two dimensional space viz., PLC and KAs. It does not help to identify project activities required for the software development. There exist many pitfalls which we witness in the au-current software development scenario. The PMBOK activities in [3] are best suitable for the general purpose projects. For software development projects in [4], technical activities are either nonexistent and are currently carried out by arbitrary human skill with adherence to managerial activities. The realization of most of the tools & techniques suggested for PMBOK managerial activities are left out as expert judgment, it is an art there is no scope to convert an art to engineer as it is not stable and there is no unique art to develop the business process. The number of technical and managerial activities is asymptotically bounded by O(n) therefore for blending these two types of activities

there exist a necessity of decomposing the activities in [5] to enable them to be free from dimension. This above factors motivated us in our project to develop the technical activities from input features and objectives. The PMI developed activities based on PLC and KAs in two dimensional space but most of these activities are suit to general projects. SDPs follow SDLC stages. Therefore the managerial activities of SDPs must be divided into SDLC stages and also PLC phases and KAs. The technological activities should carry betwixt between managerial activities and blend both types of activities so they are dimensionally equivalent to each other.

C. Taxonomy

- *Technical activities:* The activities that transforms the input features into required semiotics of objectives.
- *Software requirement specification (SRS):* It is a document prepared by the client organization involving the detailed requirement of their information system which includes the overview of the system, the functional and non functional requirement of the system, the actor interfaces, the constraints and the prototypes. This document is a part of the project charter (legal version SRS) which leads to the formal commencement of the software development project.
- *Objectives:* Objectives are the broad framework designed to meet the mission in such a way that each objectives need to meet fully or partially the mission
- *Semantics:* it deals with the constraints or rule for combining different symbols with their meaning. It resembles syntax parts of the language.
- *Syntactic:* It deals with symbols and their meanings. Normally spoken, programming or diagramming languages have different types of syntactic.
- *Pragmatics:* it deals with meaning of the semantics with respect to the user for its usage in the day today activities of the organization. This means the different perspective view of the documents or diagrams for some useful purpose.
- Semiotics: Each language (diagrammatic, spoken or programming) has well defined syntactic, semantics and pragmatics.
- *Software development life cycle (SDLC):* An architectonics of activities (to be realized by the project) organized in chronological stages of the software development. Its relevance is limited and development of information system.
- *Project life cycle phase (PLC):* There are clusters of activities used in different progressive steps of the project. There are 5PLC phases viz.., initiating, planning, exacting, closing, monitoring and controlling
- *Software development projects:* These projects are under taken based on either the client's requirements or market demand or legal necessity or realization of innovative ideas.
- *Project activities (PAs):* These are activities carried out during the progress of the project to achieve vision, mission, and objectives. These may include the technical as well as managerial activities.
- *Strength:* it is the proximity of the input characteristics in meeting the Meta parameters of the objectives.
- *Weakness:* it is the degree of obscurity of the input characteristics in meeting the Meta parameters of the objectives
- *Control flow graph (CFG):* CFG is a directed graph G(V, E) where v is the statement or cluster of sequential statements of the program with one source vertex (in degree zero) with one or more destination vertices (out degree zero) and $\mathbf{e} \in \boldsymbol{E}$ is the directed edge connecting v_i to v_j if execution control transfers from v_i to v_j
- *Data flow graph is a directed graph :* G(V,E) comprising the set if vertices $v \in V$ such that v_i represent referenced and defined attributes of statement i and $e \in E$ represents an edge with statement at the head

II. METHODOLOGY

Following steps are used to identify the technical activities.

1. The client provides the requirement for the strategic manager in the form of SRS.
2. SRS contains vision, mission and objectives.
3. Identify the syntactic, semantics and pragmatics of each objective.
4. Decompose syntactic, semantics and pragmatics recursively till there is no further scope for the decomposition of the pragmatics.
5. Identify the synonymies for each syntactic of the objectives.
    a. Identify the noun and noun phrase referenced and defined attributes of the objective.
    b. Identify the description for each noun and noun phrases in the referenced and defined attributes.
    c. If the description of the two or more nouns or noun phrases is same then the noun then identify the size and type of that noun.
    d. If the size and type are compatible then they are the appropriate synonym elements.

6. Store the synonymies in the data dictionaries.
7. Mould the SRS statement.
    a. Read the SRS in sequence if the statements of the sentence are compounded with 'and' and 'or' then decompose sentence into multiple sentence.
    b. Convert passive voice to active voice so as to transform auxiliary and impersonal verbs into corresponding intransitive and transitive verbs.
    c. Assign consecutive numbers for each statement.
8. Reorganize the statements such that the statements containing the defined attributes precede the statement/s containing those referenced attributes. This has to be represented in the form of

Table 1.Referenced/ Defined table (RDT).

statement no	Referenced Attribute	Defined Attribute

9. Prepare the logical sequence of the SRS statements which is represented in the form of the Control Flow Table (CFT).
    a. Initially we create a blank table. As and when the statement is read, if the attributes in each is more than once then sort it in the lexicographic order.
    b. Read a ref /def entry from the ref/def table.
    c. Enter the statement number in the appropriate rows of attributes at the appropriate referenced or defined column.

Table 2.Referenced/ Defined table (RDT) sorted in lexicographic order.

Attributes in lexicographic order	Referenced number	Defined number

    d. Amongst the newly entered referenced column, if the defined column statement number is already full enter the defined column statement number in the start column of the CFG and referenced statement number jump 1.
    e. If the referenced column is already full replace the entry by new statement number in the referenced column of the intermediate table.
    f. If the defined column is already filled, replace the previous statement with the current statement number and erase the referenced number of the entry.
    g. Sort the control flow graph entries with the jump 1 as primary key and start as the secondary key.

Table 3.Intermediate table

Start	Jump1

    h. In the final CFG, Create table with four column with the start, end , jump l and jump 2.
    i. In final CFG, cluster the entries of the same statement number in the jump 1 with the consecutive statement numbers in the start column.
    j. In the final CFG, cluster the entries of the same statement number in the start with the different statement numbers in the jump 1 column.
    k. In the final CFG, cluster contains more than two jump entries then each entry of the final CFG with the same start statement number take two consecutive entries in sequence till all entries of the cluster exhausted.

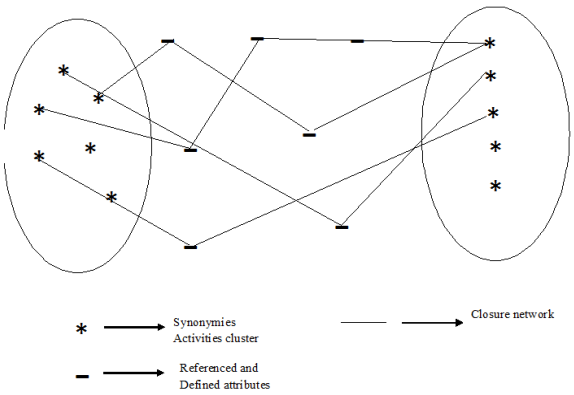
Table 4.Control flow table

Start	End	Jump1	Jump2

Continue the procedure till the last statement of referenced or defined table.

10. Recognize the ref def table in the control flow order to form data flow table.
11. Identify the synonymies for the defined attributes of the DFT.
12. Cluster the attributes based on the synonymies of the input and synonymies of the objectives.

Fig1: Identify the unified syntactic and semantics.



13. Compare the synonymies of SRS with the synonymies of the Objectives.
14. Take the closure of attribute of synonymies of the input. Find the subset; try to fill up the gap if any by known attributes set.
15. Perform SWOT analysis through literature survey.

16. The cluster of camouflaged activities forms the first level project technological Activities
Technical Activity = SDLC phase ∩ PLC stage ∩ KA

Blending of activities.

17. Next divide first level project activities based on five PLC phases viz. initiating,
Planning, executing, monitoring controlling and closing.
18. Again decompose the PLC phase activities into SDLC stages viz. Requirements, Analysis, Design, Coding, Testing and Implementation
19. Finally, divide the PLC & SDLC stage activities into KAs viz. Project Integration management, Project scope management, project time management, Project quality management, project procurement management, project risk Management, project human resource management, project configuration Management, project time management, project communication management, and configuration management.
20. After decompose technical activities in PLC phases and KAs these are the unique activities represented by the managerial activities blend them together.
Managerial Activity = PLC phase ∩ SDLC stage ∩ KA
The figure 2 below shows the representation in one dimensional line. A stage of one life cycle determines number of stages of other class. The representation normally falls in the corresponding life cycle phases , it cannot be uniquely identified in that phase therefore the life cycle should be represented in orthogonally perpendicular axis

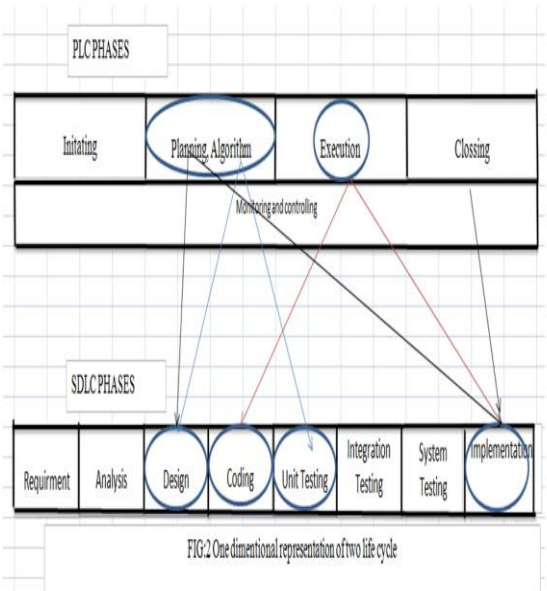


FIG:2 One dimentional representation of two life cycle

In the orthogonally perpendicular axis, it is well placed in two dimensional spaces.

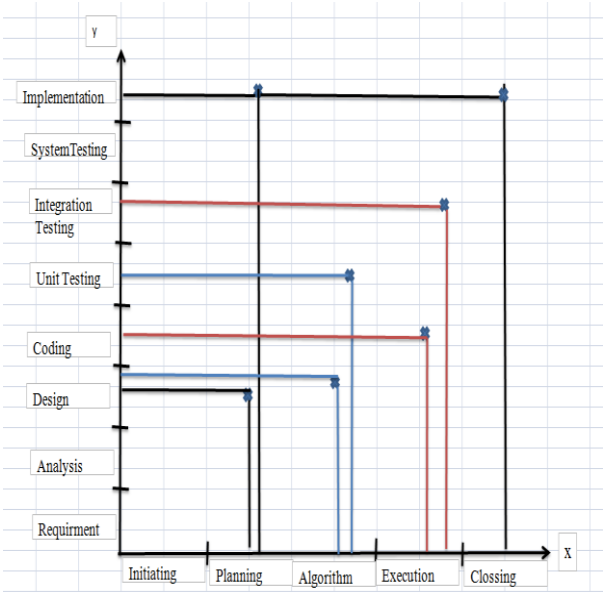


fig:3 Two dimentional representation for orthagonal life cycle

CONCLUSION

Currently the software developer uses managerial activities to identify the technical activities; this nullifies the purpose of the managerial activities. Managerial activities creates dimensional overflow of each types of activities and defalcates the transformation of art into engineering. This flounder the software development activities. In this paper we have eliminated all these defalcations, through the building of managerial activities on the technical activities developed granulated.

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