

Software Project Tracking and Oversight and Its Different Measures

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Abstract- Software Process Improvement is one of the most crucial step that the software organizations need to follow. The software process improvement is dynamic. Different software process models have been developed and have different process areas that help an organization to produce a quality product. The software project tracking and oversight is a process area that is common to most of the software process improvement (SPI) models and plays a great role in order to produce a quality product and deliver it on time. This paper introduces the various measures that is used for software project tracking and oversight and the percentage of use of these measures in different small and medium enterprises (SMEs) of India.

Index Terms- Activities, Performance, Quality, Resource, Software Project Tracking and Oversight

I. INTRODUCTION

Different software process models are developed to help different software organization to produce a quality product and compete with the changing market demands. The different software models that are studied are CMM[1], PSP[2], TSP[3], CMMi[4], Six-Sigma[5][6], P-CMM[7], Malcolm Balridge National Quality Award (MBNQA)[8], SE-CMM[9], ISO 9000[10][11], Trillium model[12], SPICE[13], BOOTSTRAP[14], ISO/IEC 12207[15], SECAM[16], SDCE[17], TickIT[18], IEEE 1220[19], IDEAL model[20], PRISMS[21], K-model[22] and TRISO[23].

II. SOFTWARE PROJECT TRACKING AND OVERSIGHT

The main objective of software project tracking and oversight means to have an accurate visibility over actual project development progress and the management can take action when the project development progress is not according to software project plans. The software project tracking and oversight are measured in terms of activities, resource information and performance and quality information. It's the foremost preliminary step for proceeding with any research work writing. The software project tracking and oversight process area is included CMM, CMMi, PSP, TSP, Six-Sigma, TRISO, ISO 9000, BOOTSTRAP, SECAM, SDCE, and TickIT. The process areas of different software process models are identified and the location of software process tracking and oversight in the different SPI models. The TRISO model process areas consist of 3 levels. The first level consist of process areas from CMMi and is known as Process Capability Maturity (PCM) and the second level process areas consist from the P-CMM and is known as Human Capability Maturity (HCM)[23]. The Bootstrap model integrates process areas from CMM, ISO 9000, ISO/IEC 12207 and ISO/IEC 15504[24]. ISO 9000 contains the process areas of CMM and SE-CMM [25].

Table I: Process areas of CMM, PSP, TSP

Maturity Levels	Key Process Areas
5.Optimizing	Process Change Management (CMM ,PSP,TSP) Technology Change Management (CMM ,PSP,TSP) Defect Prevention (CMM,PSP,TSP)
4.Managed	Software Quality Management (CMM ,PSP,TSP) Quantitative Process Management (CMM ,PSP,TSP)
3.Defined	Peer Reviews(CMM,PSP,TSP) Intergroup Coordination(CMM ,TSP) Software Product Engineering(CMM,PSP,TSP) Integrated Software Management(CMM ,PSP,TSP) Training Program(CMM,PSP) Organization Process Definition(CMM,PSP,TSP) Organization Process Focus(CMM,PSP,TSP)

2.Repeatable	Software Configuration Management(CMM ,TSP) Software Quality Assurance(CMM ,TSP) Software Subcontract Management(CMM) Software Project Tracking and Oversight(CMM,PSP,TSP) Software Project Planning(CMM,PSP,TSP) Requirement Management(TSP)
1.Initial	

Table 1 shows the process areas of CMM, PSP and TSP.The Software Project Tracking and Oversight is located in the Repeatable maturity level.

Table II:Process areas of CMMi,SS and TRISO

Maturity Levels	Key Process Areas
5.Optimizing	Organizational Innovation and Deployment(CMMi ,SS,TRISO) Causal Analysis and Resolution(CMMi,SS,TRISO)
4.Quantitatively Managed	Organizational Process Performance(CMMi ,SS,TRISO) Quantitative Project Management(CMMi ,SS,TRISO)
3.Defined	Requirements Development(CMMi ,SS,TRISO) Technical Solution(CMMi,TRISO) Product Integration(CMMi,TRISO) Verification(CMMi,SS,TRISO) Validation(CMMi,SS,TRISO) Organizational Process Focus(CMMi,SS, TRISO) Organizational Process Definition(CMMi,SS,TRISO) Organizational Training(CMMi,SS,TRISO) Integrated Project Management(CMMi ,SS,TRISO) Integrated Supplier Management(CMMi,TRISO) Risk Management(CMMi,TRISO) Decision Analysis and Resolution(CMMi,SS,TRISO)
2.Managed	Requirements Management(CMMi ,SS,TRISO) Project Planning(CMMi,SS,TRISO) Project Monitoring and Control(CMMi,SS,TRISO) Supplier Agreement Management(CMMi,TRISO) Measurement and Analysis (CMMi,SS,TRISO) Process and Product Quality Assurance(CMMi,TRISO) Configuration Management(CMMi,TRISO)
1.Performed	

Table 2 shows the process areas of CMMi, and SS.The function of Software Project Tracking and Oversight process area is done by Project Monitoring and Control process area.The process area is located in the Managed maturity level.Thefirst level of TRISO contains the process areas of CMMi.

Table III:Process areas of SECAM

1.Management	2.Organization	3.Systems Engineering
1.1Planning 1.2.Tracking and Oversight 1.3.Sub-Contract Management 1.4.Inter-group Coordination 1.5.Configuration Management 1.6.Quality Management 1.7.Risk Management 1.8.Data Management	2.1.Process Management and Improvement 2.2.Competency Development 2.3.Technology Management 2.4.Environment and Tool Support	3.1.System Concept Definition 3.2.Requirement and Functional Analysis 3.3.System Design 3.4.Integrated Engineering Analysis 3.5.System Integration 3.6.System Verification 3.7.System Validation

Table 3 contains the process area of SECAM.The Software Project Tracking and Oversight is named as Tracking and Oversight in Management category.

Table IV:Process areas of SDCE

1.Program Management	1.1.Management Authority, Responsibility and Accountability 1.2.Program Planning and Tracking 1.3.Sub-Contractor Management 1.4.Legal and Contracting Issues 1.5.Risk Control	2.System Engineering	2.1.System Requirement Development,Management and Control 2.2.Computer System Architecture Design and Review Process 2.3.Supportability 2.4.Intergroup Coordination 2.5.System Engineering Planning 2.6.System Integration and Test 2.7.Reuse
3.Software Engineering	3.1.Software Development Planning 3.2.Software Project Tracking and Reporting 3.3.Software Requirements Management 3.4.Software Design 3.5.Software Coding and Unit Testing 3.6.Software Integration and Test	4.Quality Management and Product Control	4.1.Software Quality Management 4.2.Software Quality Assurance 4.3.Defect Control 4.4.Metrics 4.5.Peer Reviews 4.6.Internal Independent Verification and Validation 4.7.Software Configuration Management 4.8.Documentation
5.Organizational Resources and Program Support	5.1.Organizational Standards and Procedures 5.2.Facilities 5.3.Training 5.4.Human Resources 5.5.Technology Assessment and Transition 5.6.Organizational Process Management 5.7.System/Software Engineering Environment	6.Program Specific Technologies	6.1.Artificial Intelligence 6.2.Safety Critical Digital Systems 6.3.Complex Hardware Development 6.4.Database Management

Table 4 contains the process area of SDCE.The software project tracking and oversight process area is named as software project tracking and reporting in software engineering category.

III. SOFTWARE PROJECT TRACKING AND OVERSIGHT AND ITS MEASURES

A survey is made in different software development small and medium enterprises(SMEs) in India.The survey is all about the use of different process areas in SMEs.A questionnaire consisting of 22 software process improvement models and 278 process areas are surveyed.The names of different SMEs where the survey is conducted are FutureSoft,IT Pyramid,Zaloni Technologies,DZ Engineering,Aon Hewitt,CGI Technologies,IAG Automation,SIQUES,Vacpic Technologies Pvt Ltd,Aris Global Software Pvt Ltd,Yodlee Pvt Ltd,Roma Think Soft,Exilant Technologies Pvt Ltd,Xixom Technology,IQ Systems India Pvt Ltd,Globrin Technologies,Targus Technologies and Verschaska Infotech Pvt Ltd.

The percentage of use of different measures are

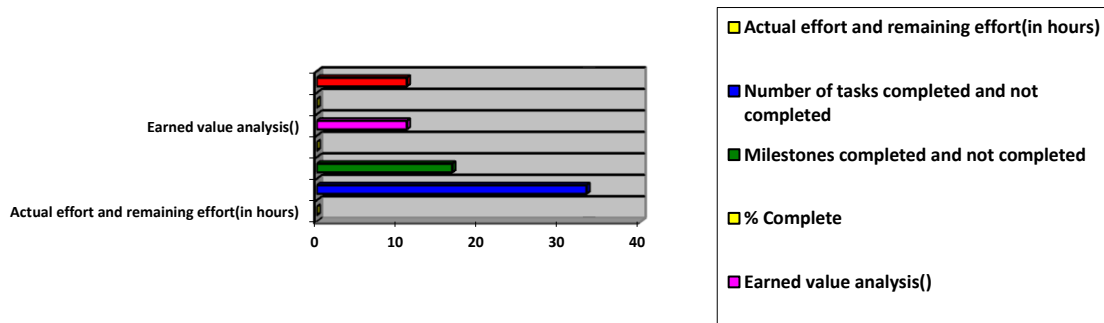


Fig 1: Percentage of use of Software Project Tracking and Oversight Measures (in terms of activities)

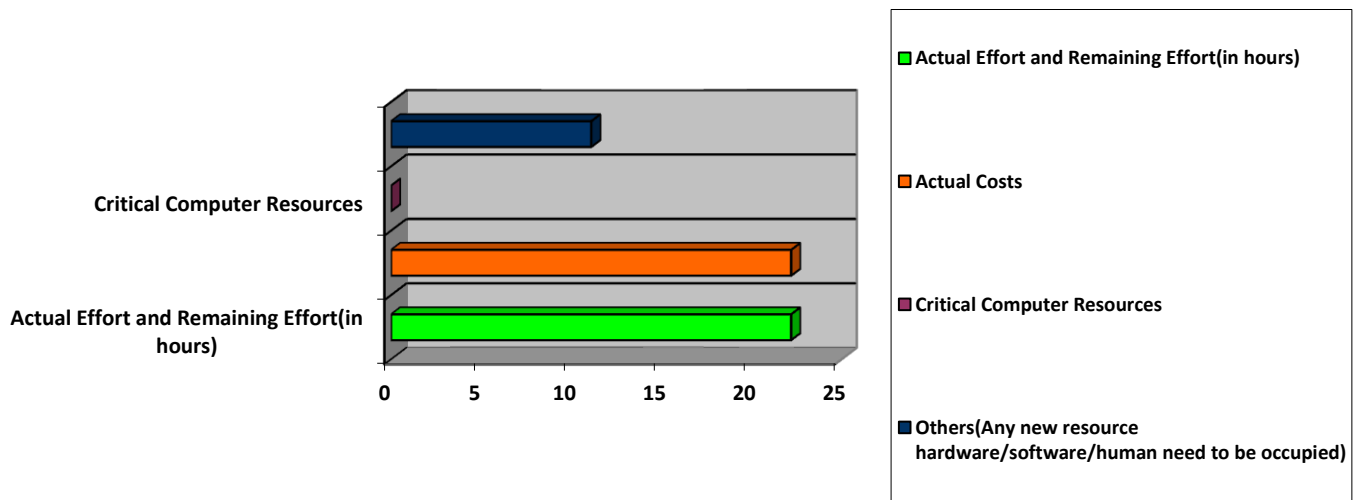


Fig 2: Percentage of use of Software Project Tracking and Oversight Measures (in terms of resource information)

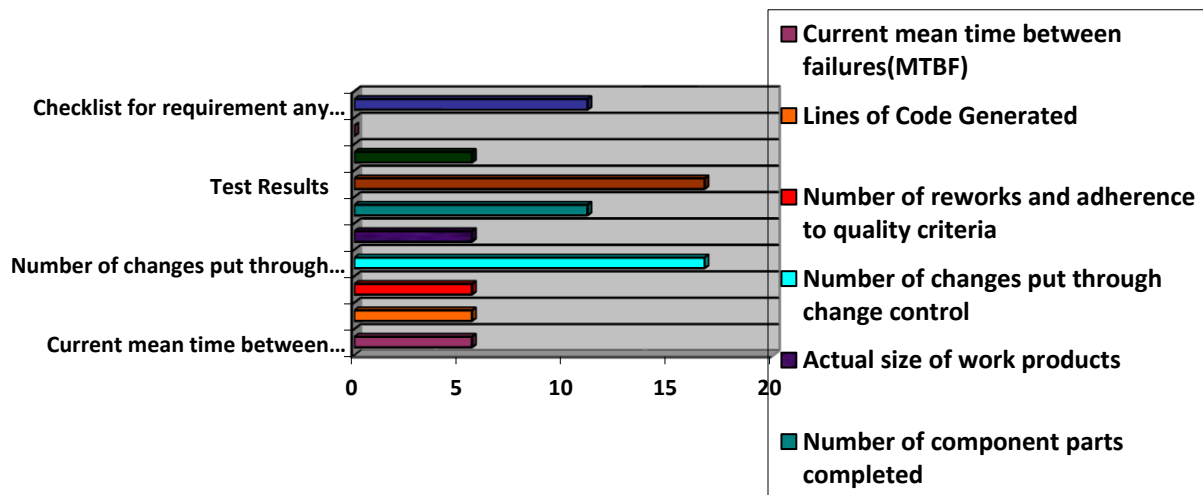


Fig 3: Percentage of use of Software Project Tracking and Oversight Measures (in terms of performance and quality information)

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