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University*

**Computer and Information
Sciences**

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1. SOFTWARE PROJECT MANAGEMENT PLAN

1 OVERVIEW

This section provides an overview of the purpose, scope, and objectives of the project, the project assumptions and constraints, a list of project deliverables, a summary of the project schedule and resources, and review plan for this System/software project plan. **(M)**

1.1 Project Summary

See subsections

1.2 Purpose, Scope, and Objectives

This subsection defines the purpose, scope, and objectives of both the project and the product to be delivered. This subsection should also describe any considerations of scope or objectives to be excluded from the system/software project or the resulting product. The statement of scope will be consistent with similar statements in higher level documents, if they exist. **(M)**.

This subsection will also provide a brief statement of the business needs to be satisfied by the release, with a concise summary **(M)**.

1.3 Assumptions and Constraints

This subsection describes the assumptions upon which the system/software project is based and externally imposed constraints on project factors such as the schedule, budget, resources, software, technology to be employed and product interfaces **(M)**.

1.4 Project Deliverables

The subsection lists all of the work products that will be delivered the delivery dates, delivery organization, format, and quantities required in order to satisfy project requirements **(M)**.

1.5 Schedule and Budget Summary

This subsection provides a top-level summary of the schedule and budget for the project, The level of detail should be restricted to an itemization of the major work activities and supporting processes (for example milestones, and WBS) **(M)**.

2 EVOLUTION OF THE PLAN

This section specifies the plans for producing both scheduled and unscheduled updates to the plan. Methods for determining the updates will be specified. It will also specify the method for placing the initial plan under configuration management and to control subsequent change **(M)**.

3 REFERENCES

This section of the plan provides a complete list of all documents and other source materials referenced in the plan. Each document should be completely identified **(M)**.

4 DEFINITIONS

This section defines or provides references to the definition of all terms and acronyms required for proper understanding of the System/software plan **(M)**.

5 PROJECT ORGANIZATION

This section identifies interfaces to organizational entities external to the System/software project; describe the project's internal organizational structure, and define roles and responsibilities for the project **(M)**.

5.1 External Interfaces

This subsection describes the organizational boundaries between the System/software project and external entities **(M)**.

5.2 Internal Structure This subsection describes the internal structure of the System/software project organization and includes the interfaces among the development groups of the development team. In addition, the organizational interfaces between the project and other organizational entities that provide supporting processes, such as configuration management, quality assurance are identified in this subsection. Organization charts, or other graphical tools can be used as descriptive devices **(M)**.

5.3 Roles and Responsibilities This subsection identifies and states the nature of each major work activity and supporting process. In addition, it identifies the organizational units that are responsible for those processes and activities. A matrix of work activities and supporting processes versus organizational unit or CRC cards can be used to depict project roles and responsibilities **(M)**.

6 MANAGEMENT PROCESSES This section specifies the System/software project management processes for the project. This section must be consistent with the statement of project scope and includes the project start-up plan, risk management plan, project work (schedule) plan, control plan, and post implementation review plan **(M)**.

6.1 Start-Up Plan This subsection specifies the estimation plan, staffing plan, resource acquisition plan, and training plan. Depending on the size of the project, these plans may be incorporated directly or by reference to other plans **(M)**.

6.1.1 Estimation Plan This subsection specifies the schedule and resources for completing the System/software project as well as policies, methods, tools, and techniques used in estimating cost, schedule, resources, and risk factors **(M)**.

- 6.1.2 Staffing Plan** This subsection specifies the number of staff required by skill level, the project phase in which the numbers of staff and types of skills are needed, and the duration of the need. In addition, this subsection specifies the source of staff (existing, new hire, matrix, or consultants). Staffing level graphics (Gantt Chart, Fishbone diagrams) will be used to document staffing requirements **(M)**.
- 6.1.3 Resource Acquisition Plan** This subsection specifies the plan for acquiring the resources (in addition to staff) needed to successfully complete the project. The resource acquisition plan should include a description of the acquisition process. The plan should include, but is not limited to, equipment, hardware, software, training, facilities, and support items. The plan should identify when the resources are needed and acquisition constraints **(M)**.
- 6.1.4 Training Plan** This subsection specifies the training needed to ensure that sufficient number of necessary staff skill levels are available to successfully conduct the System/software project. The training schedule includes the types of training, number of staff to be trained, entry and exit criteria for training, and the training method. The training plan should include both technical and managerial training needs **(M)**.
- 6.2 Work Plan** This section specifies the work activities, schedule, resources, and budget details for the System/software project **(M)**.
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6.2.1 Work Activities

This subsection specifies the work activities to be performed in the System/software software project. The Work Breakdown Structure (WBS) will be used to depict the work activities and the relationship among work activities. Work activities should be decomposed to a level that exposes all project risk factors and supports accurate estimate of resource requirements and schedule duration form each work activity. Work packages should be used to specify, for each work activity, factors such as the necessary resources, estimated duration, work products to be produced, acceptance criteria for the work products, and predecessor and successor work activities. The level of decomposition for different work activities in the WBS may be different depending on factors such as the quality of the requirements, familiarity of the work, and the technology to be used **(M)**.

6.2.2 Schedule Allocation

This subsection provides scheduling relationships among work activities in a manner the depicts the time-sequencing constrains and illustrates opportunities for concurrent work activities. Any external constraints on scheduling of particular work activities will be indicated on the work activity schedule. The schedule should include frequent milestones that can be assessed for achievement using objective indicators to assess the scope and quality of work products completed at those milestones. Techniques for depicting schedule relationships may include milestone charts, activity lists, activity Gantt charts, activity networks, critical path networks, and PERT. **(M)**.

6.2.3 Resource Allocation

This subsection will provide a detailed itemization of the resources allocated to each major work activity in the project work breakdown structure. Resources will include the numbers and required skill levels of personnel for each work activity. Resource allocation may include, as appropriate, personnel by skill level and factors such as computing resources, software tools, special test environments, simulation facilities, and management support. A separate line item should be provided for each type of resource for each work activity. A summary of resource requirements for the various work activities should be collected from the work packages of the work breakdown structure and presented in graphical (tabular) form. **(M)**.

6.2.4 Budget Allocation

This subsection provides a detail breakdown of necessary resource budget for each major work activity in the project work breakdown structure. The activity budget will include the estimated cost for activity personnel and may include, as appropriate, costs for factors such as meetings, software tools, development and test environments, and management support. A separate line item will be provided for each type of resource in each activity budget. The work activity budget may be developed using a spreadsheet presented in tabular form. **(M)**.

6.3 Control Plan

This subsection specifies the metrics, reporting mechanisms, and control procedures necessary to measure, report, and control product requirements. The project work schedule, budget, resources, and the quality of development processes and work products **(M)**.

6.3.1 Requirement Control and Traceability

This subsection specifies the control mechanisms for measuring, reporting, and controlling changes to the product requirements. This subsection will also specify mechanisms used in assessing the impact of requirement changes on schedule, budget, and resources, and risk factors. Configuration Management techniques should include change control procedures and a change control review process. Techniques that may be used for requirements control include traceability, prototyping/modeling, impact analysis, and reviews **(M)**.

6.3.2 Schedule Tracking and Adjustment

This section specifies the control mechanisms used to measure the progress of work completed at the major and minor project milestones, to compare actual progress to planned progress, and to implement corrective action when actual progress does not conform to planned progress. The schedule control plan will specify the methods and tools used to measure and control schedule progress. Achievement of schedule milestones should be assessed using objective criteria to measure the scope and quality of work products at each milestone **(M)**.

- 6.3.3 Budget Tracking and Adjustment** This subsection specifies the control mechanisms used to measure the cost of completed work completed, compare planned cost to budgeted cost, and implement corrective action when actual cost does not conform to budgeted costs. The budget control plan will specify the intervals at which cost reporting will be accomplished and the methods and tools used to manage the budget. The budget should include frequent milestones. A mechanism such as earned value tracking should be used to report the budget and schedule plan, schedule progress, and the cost of work completed **(M)**.
- 6.3.4 Quality Control** This subsection specifies the mechanisms used to measure and control the quality of the work processes and resulting work products. Quality control mechanisms may include quality assurance of work products, qualification (verification and validation), reviews, audits, and process assessment **(M)**.
- 6.3.5 Reporting Mechanisms** This subsection specifies the reporting mechanisms, report formats, and information flows used in communicating project status within the project and to management and the customer. The methods, tools, and techniques of communication will be specified. The frequency and detail of the reports related to measurement and control should be consistent with the project scope, criticality, risk, and visibility **(M)**.
- 6.3.6 Metrics Collection Plan** This subsection specifies the methods, tools, and techniques used in collecting and retaining project metrics. The metrics collection plan will specify the metrics to be collected, the frequency of collection, and the methods used in validating, analyzing, and reporting the metrics. This plan should be consistent with the SEPG policies and standards for retention of project management data **(M)**.
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6.4 Risk Management Plan This subsection specifies the risk management plan for identifying, analyzing, and prioritizing project risk factors. It also describes procedures for contingency planning, and the methods used in tracking the various risk factors, evaluating changes in risk factors, and the response to changes. The risk management plan also specifies plans for assessing initial risk factors and the on-going identification, assessment, and mitigation of risk factors throughout the project lifecycle **(M)**.

6.5 Post Implementation Plan This subsection contains the plans necessary to ensure orderly termination of the software project. Items include plans for archiving project materials, baseline software deliverables, and post-mortem debriefings of project staff, and preparation of the Post Implementation Review (PIR) **(M)**.

7 TECHNICAL PROCESSES This section specifies the development process model, the technical methods, tools, and techniques to be used to develop the various work products; plans for establishing and maintaining project infrastructure, and product acceptance plans **(M)**.

7.1 Process Model This subsection defines the relationships among major project work activities and supporting processes by specifying:

The flow of work products among activities and functions; the timing of work products to be generated; reviews to be conducted; major milestones to be achieved; baselines to be established; project deliverables to be completed; and required approvals during the project.

The process model for the project includes project initiation and project termination activities **(M)**.

7.2 Methods, Tools, and Techniques This subsection specifies the development methodologies, programming languages and other notations, and the tolls and techniques used to specify, design, develop, configure, integrate, document, deliver, modify, and maintain the project deliverables. In addition, standards, policies, and procedures governing development and/or modification of work products will be specified **(M)**.

7.3 Infrastructure Plan The subsection specifies the plan for establishing and maintaining the development and test environments (hardware, operating system, network, and software), and the policies, procedures, standards, and facilities required for the software project. These resources may include, but are not limited to, workstations, networks, software tools for analysis, design, development, testing, and project management, facilities, security, and other services **(M)**.

7.4 Product Acceptance and Migration Plan This subsection specifies the plan for quality assurance and operations acceptance of the deliverable work product generated by the System/software software project. Objective criteria for determining acceptability of the deliverable work products are specified in this plan. Any technical processes, methods, or tools required for product acceptance are specified in the product acceptance plan. Methods such as testing, demonstration, and inspection should be specified in the plan **(M)**.

8 SUPPORTING PROCESSES PLANS

This section contains plans for supporting processes that cover the development life cycle of the development project. These plans include, but are not limited to, configuration management, software qualification (verification and validation), documentation, quality assurance, reviews, audits, problem tracking and resolution, and management. Plans for supporting processes will be developed to a level consistent with other sections and subsections of the project plan. Specifically, roles, responsibilities, authorities, schedule, budgets, resource requirements, risk factors, and work products for each supporting process will be specified. Explicit justification will be provided for supporting process plans that are included as part of the software project **(M)**.

8.1 Configuration Management Plan

This subsection contains the configuration management plan for the software project. It includes the methods used to provide configuration identification, control, status accounting, evaluation, and release management consistent with Polytechnic University standards and policies. In addition, this subsection specifies the configuration management process for baselining of work products, logging and analysis of change requests, change control procedures, tracking of changes in progress, and procedures for developer notification when baselines are established or modified. The configuration management process will be supported by automated configuration management and change control tools **(M)**.

8.2 Qualification (Verification and Validation) Plan

This subsection contains the qualification plan for the software project. The plan identifies the scope, tools, techniques, and responsibilities for qualification work activities. The organizational relationships and degrees of independence between development activities and qualification activities are specified in the plan. The verification plan specifies techniques such as traceability, milestone reviews, walkthroughs, peer reviews, prototyping, simulation, and modeling. The validation plan includes techniques such as testing, demonstration, analysis, and inspection. Automated tools used in qualification testing should be specified **(M)**.

- 8.3 Documentation (library) Plan** This subsection contains the documentation plan for the software project. The plan includes requirements for generating internal and deliverable work products. Organizational entities responsible for providing information, generating and reviewing documents will be specified in the documentation plan. Internal work products should include such items as architectural descriptions, design specifications, interface specifications, traceability metrics, test plans, meeting minutes, and review reports. Deliverable work products may include source code, executable code, manuals, on-line help, regression test scenarios/scripts, configuration library, and on-line debugging/replay tool documentation. The documentation plan should document who will generate it, who will review it, who will approve it, date for initial baseline version, and distribution list for review and baseline versions **(M)**.
- 8.4 Quality Assurance Plan** This subsection provides plans for assuring that the software project fulfills its commitment to the software process and the software product as specified in the requirements specification, the software project plan, supporting plans, and any standards, policies, or guidelines to which the process or the product must adhere. Quality assurance procedures may include analysis, inspections, reviews, audits, and assessment **(M)**.
- 8.5 Reviews and Audits** This subsection specifies the schedule, resources, methods, and procedures used in conducting project reviews and audits. The plan should specify plan for Polytechnic University management reviews, developer peer reviews, technical reviews, walkthroughs, inspections, and audits **(M)**.
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- 8.6 Problem Resolution Plans** This subsection specifies the resources, methods, tools, techniques, and procedures used in reporting, analyzing, prioritizing, and processing software problem reports generated during the project. The problem resolution plan should indicate the roles of developers, configuration management, change control, and qualification in problem resolution work activities. Effort devoted to problem reporting, analysis, and resolution should be separately reported in the work breakdown system so that work can be tracked and process improvement accomplished **(M)**.
- 8.7 Environment Management Plans** This subsection contains plans for configuring and managing the development and testing environments. The development and test environment description and plans are specified in the plan for each environment. The plans should include developer and management access to the automated tools described in relevant sections and subsection of the project plan, **(M)**.
- 8.8 Process Improvement Plan** This subsection includes plans for periodically assessing the project, determining areas for improvement, and implementing improvement plans. The process improvement plan should be closely related to the problem resolution plan. (Each reported problem should be examined to determine the root cause of the problem, leading to a possible process improvement). This analysis can significantly reduce rework during the project life cycle. The goal of the process improvement plans is to enhance the effectiveness and efficiency of the project life cycle activities. Implementation of improvement plans should be examined to identify processes that can be improved without serious disruptions to the on-going project and those which can best be implemented at the organizational level **(M)**.
- 9 ADDITIONAL PLANS** This section contains additional plans that may be required to satisfy product requirements and agreements. Additional plans for a particular project may include plans for assuring that safety, security, performance, capacity, and special equipment are met. Other plans may include migration, maintenance, network, or product support **(O)**.
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10 INDEX

Self Explanatory

11 RATIONALE

None

12 NOTES

None

13 APPENDICES

Appendices may be included, either directly or by reference to other documents. Appendices may provide supporting details not appropriate for inclusion in the project plan **Schedule and defect tracking (M)**.

13.1 Schedule Tracking

Time (hours)

Artifact or Deliverable	Who (individual and team)	Estimated	Actual	Difference
RAS	For each team member			
	Summary for entire team			

Artifact or Deliverable	Who (individual and team)	Estimated	Actual	Difference
SPMP				

Cumulative

Who (individual and Team)	Estimated	Actual	Difference

13.2 Defect Tracking

Artifact or Deliverable	Who (individual and team)	Estimated	Actual	Difference
RAS				

Artifact or Deliverable	Who (individual and team)	Estimated	Actual	Difference
SPMP				

Cumulative

Who (individual and team)	Estimated	Actual	Difference

- Gantt or Microsoft Project Schedule