Development and Quality Plans

By: MSMZ

Case Study

- Imagine that you have been appointed as a head of a big project. As it often the case in the software industry, you come under serious time pressure from the very first day. Because you were MEMBER of the proposal team and participated in most of the meetings held with customer, you are confident that you know all that is necessary to do the job. You INTEND to use the proposal plans and internal documents that the team had prepared as your DEVELOPMENT and QUALITY plans. You are prepared to RELY on these materials because you know that the proposal and its estimates, including the timetable, staff requirements, list of project documents, scheduled design reviews, and list of development risk.

- You therefore was a bit disappointed that at this CRUCIAL point of the project, the Development Department Manager demands that you immediately prepare new and separate project development plans ("Development Plan") and project quality plan ("Quality Plan"). When you claim that the completed proposal could serve as the requested plans. BUT the manager still insists that they must be updated with new and more comprehensive topics should be added to plan. "By the way , don't forget that a period of 7 months has gone between the proposal preparation and the final signing of the contract" mention by the manager.

Department Manager is right!!

- Because, you may discover that some team members will not be available at the scheduled dates due to delays in completion of their current assignment or

- The consulting company that had agreed to provide professional support in a specialized and crucial area has gone bankrupt.

- These are example of two of problem that may arise.

Development Plan and Quality Plan

In summary, project NEEDS Development Plan and Quality Plan:-

- Based on proposal material that have been re-examined and updated

- More comprehensive than the approved proposal, especially with on the schedule, resource estimates and development risk.

- Include additional subjects, absent from the approved proposal.

Objective

- After completing this chapter, you will be able to:
  - Explain the objectives of a development plan and a quality plan.
  - Identify the elements of development plan
  - Identify the elements of a quality plan
  - Discuss the importance of development and quality plans for small projects and also for internal projects

Objective of Development Plan and Quality Plan

Planning, as a process, has several objectives, each is meant to prepare enough foundation for the following:-

1. Scheduling development activities
2. Recruiting team members and allocating development resources
3. Resolving development risk
4. Implementing required SQA activities
5. Providing management with data needed for project control.

Elements of the development plan

Based on the proposal materials, the project development plan is prepared to fulfill the above objective. The following elements, each is applicable to different project component.

1. Project products

The development plan includes :

- Design documents specifying dates of completion.
- Software products (completion date and installation site)
- Training task (dates, participants and sites)

Elements of the development plan

2. Project interfaces

The development plan include:

- Interfaces with existing software interface
- Interface with other software /hardware development teams that are working in the same project.
- Interfaces with existing hardware.

Elements of the development plan

3. Project methodology and development tools to be applied at each phase of the project.

4. Software development standards and procedures.

- A list should be prepared of the software development standards and procedures to be applied in project.

5. The mapping of the development process.

- Involves providing detailed descriptions of each project phases. Activity descriptions include:-
  - ❑ Estimate of the activity duration
  - ❑ Description of each activities
  - ❑ Type of professional resources required.

Elements of the development plan

6. Project milestones
   - For each milestone, its completion time and project products (document and code) are to be defined.
7. Project staff organization

   Comprises:-
   - Organizational structure (Project team and their task)
   - Professional requirements (Experience and cert)
   - Number of team members (According to each activities)
   - Names of team leaders and team members
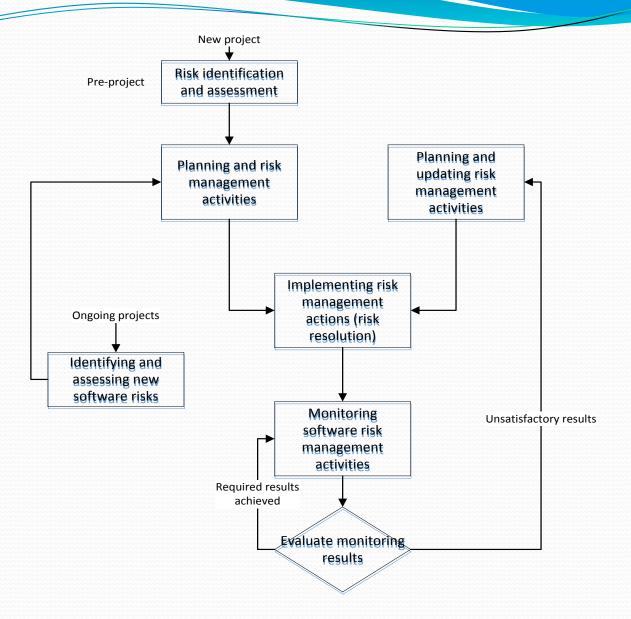   - Coordination with external participants

Elements of the development plan

8. Development facilities
   - Required development facilities and the period required for its use.

9. Development risk
   - Technology gap (Lack of sufficient professional knowledge)
   - Staff shortage
   - Interdependence of organizational (Supplier of specialized hardware/software not fulfill their obligation on schedule)

10. Control methods
    - In order to control project implementation, the project manager apply a series of monitoring practices when preparing progress reports and coordinating meetings.

11. Project cost estimation (Based on proposal costs estimates, followed by continuous relevance review)

The Risk Management Process

- The risk management process combines
  - Planning activities
    - Identification of software risk items (SRIs)
    - Evaluation of the identified SRIs

      $$Exp(risk) = Est(dam) \times Prob(mat)$$

    - Planning risk management actions (RMAs)
  - Implementation activities
    - Assignment of staff to each RMA and its implementation schedule
  - Monitoring activities
    - Systematic, periodic activities to monitor the implementation of risk management plan

New project

Pre-project

Risk identification and assessment

Planning and risk management activities

Planning and updating risk management activities

Implementing risk management actions (risk resolution)

Ongoing projects

Identifying and assessing new software risks

Monitoring software risk management activities

Unsatisfactory results

Required results achieved

Evaluate monitoring results

By: MSMZ

Major Software Risk Item (SRI)

**Software risk item
(Boehm and Ross)**
Personnel shortfalls

Risk management actions (RMAs)
a. Efficient project organization, adequate staff and team size
b. Arranging for and training replacements to take over in case of turnover and unanticipated workloads
c. Arranging for "loans" of professionals with specialized knowledge and experience if the need arises.

Major Software Risk Item (SRI)

**Software risk item
(Boehm and Ross)**
Unrealistic schedules and
budgets

Risk management actions (RMAs)

a. Application of detailed and thorough analysis to
requirements and estimated schedules and costs
b. Negotiating with the customer to change schedules re
risky parts

Major Software Risk Item (SRI)

Software risk item
(Boehm and Ross)
Developing wrong software functions

Risk management actions (RMAs)
a. Application of detailed and thorough analysis to requirements and estimated schedules and costs
b. Apply intensive software quality assurance measures such as inspections, design reviews, and benchmarking
c. Arrange for user participation in the development process

Major Software Risk Item (SRI)

Software risk item
(Boehm and Ross)
Continuing stream of requirement changes

Risk management actions (RMAs)
a. Applying efficient change control (change requests screening)
b. Apply intensive software quality assurance measures such as inspections, design reviews, and benchmarking
c. Efficient project organization, adequate staff and team size

Elements of the quality plan

All or some of the following items, depending on the project, comprise the following elements:-

1. Quality goals
   - Refer to developed software system's substantive quality requirements.
   - Preferably stated in the form of quantitative as opposed to qualitative measures.

- Examples:-
  - A software system to serve the help desk operations of an electrical appliance manufacture is to be developed. The help desk system (HDS) is intended to operate for 100 hours per week.
  - The software quality assurance team was requested to prepare a list of Quantitative Quality Goals appropriate to certain qualitative requirements.

HDS Qualitative Requirements	Related quantitative Quality goals
The HDS should be user friendly	A new help desk operator should be able to learn the details of the HDS following a course lasting less than 8 hours and to master operation of HDS in less than 5 working days
The HDS should be very reliable	HDS availability should exceed 99.5% (HDS downtime should not exceed 30 min per week)
The HDS should operate continuously	The system's recovery time should not exceed 10 min in 99% of cases of HDS failure
The HDS should be highly efficient	An HDS operator should be handle at least 100 customer calls per 8-hour shift
The HDS should provide high quality service to the applying customer	Waiting time for operator response should no exceed 30 sec in 99% of the calls

Elements of the quality plan

2. Planned review activities

The plan should provide a complete listing of all planned review activities with the following determined for each activities:-

- The scope of the review activity
- The type of the review activity
- The schedule of review activity
- The specific procedures to be applied
- Who is responsible for carrying out the review activities.

Elements of the quality plan

3. Planned software tests

    Include:-

    - The unit, integration or the complete system to be tested.
    - The type of testing activities, including software to be used, if any.
    - The planned test schedule
    - The specific procedures to be applied
    - Who is responsible for carrying out the test

Elements of the quality plan

4. Planned acceptance test for externally developed software
   - Purchased software
   - Software developed by subcontractors
   - Customer-supplied software

5. Configuration management
   Include:-
   - Configuration management tools
   - Configuration management procedures

Development and Quality plan for small projects

- Does a project of only 40 working days' duration, to be performed by one professional and completed within 12 weeks, justify the investment of a man-day in order to prepare full-scale development and quality plans?

- Does a project to be implemented by three professionals, with a total investment of 30 man-days and completed within five weeks, require full-scale plans?

Development and Quality plan for small projects

- It should be clear that development and quality plan procedures applicable to large projects cannot be automatically applied to small projects.

- Situations where STANDARD development and quality plan may or may not be required.

  1. Projects requiring 15 days – not required

  2. Project requiring 50 days where no significant software risk item had been identified – at project leader's discretion

  3. Small project but complicated that need to be complete within 30 days, in which there is heavy penalty on not being completed on time - obligatory

Development and Quality plan for small projects

- Recommended elements of development and quality plans for small projects
  - Development plan:
    - Project products, indicating deliverables
    - Project benchmarks
    - Development risks
    - Estimates of project cost
  - Quality plan:
    - Quality goals

Development and Quality plan for small projects

- Benefits of preparing development and quality plans for small projects
1. Improvements in the developer's understanding of the task.
2. Greater commitment to complete the project as planned.
3. Easier for management and customer to monitor and identify delays earlier on.
4. Better understanding with respect to the requirements and timetable between developer and customer.

Development and Quality plan for internal projects

- Benefits of preparing development and quality plans for internal projects to the software development department:

1. Avoiding budget overruns.

2. Avoiding damage to other projects due to the delays in releasing professional resources involved in internal project.

3. Avoiding loss of market status caused by delayed completion of external projects triggered by late completion of internal projects.

Development and Quality plan for internal projects

- Benefits of preparing development and quality plans for internal projects to the internal customer:

1. Smaller deviations from planned completion dates and smaller budget overruns.

2. Better control of the development process including earlier detection of potential delays.

3. Fewer internal delay damages.

Development and Quality plan for internal projects

- Benefits of preparing development and quality plans for internal projects to the organisation:

1. Reduced risk of market loss due to late arrival of the product.
2. Reduced risk of being sued for late supply of products.
3. Reduced risk of requesting a budget supplement.
4. Reduced risk of impairing the firm's reputation.

Example Software Quality Plan

Microsoft Office Word Document

By: MSMZ