Management Skills

for Planing for Project Management

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Contents

1 Introduction

A planning is an essential part of a project management. The plan provides many advantages for the project manager, investors and other stakeholders, because:

- It gives a structure to the process.
- It allows to predict different problems at a very early stage.
- It can be used to measure performance of the project execution.
- It gives an opportunity to analyze problem and figure out the best solution for it during the project execution process.
- It helps to set a budget and deadlines.
- It is the main source of information about the project for stakeholders and investors.
- It helps in a conflict resolution.

It is almost impossible to manage more or less large scale project without proper planning. Usually, a project plan contains at least:

- Scope Statement
- Risk Register
- Communication Plan
- Work breakdown structure
- Budget

Let's take a little bit deeper look into the documents. [2]

2 Scope Statement

Scope Statement is the main document which contains an explanation of project justification, requirements and the project success criteria. It also contains an information about product-related deliverables and the list of documents related with the project. The document is used to separate rights and obligations between a project owner, a project manager and a project team. The separation is important for a conflict resolution.[2]

2.1 Scope Statement example

You can see an example of a Scope Statement below.

Project Title: Space monitor
Date: February 15, 2016 Prepared by: April 27, 2015

Project Justification:
The aim is to develop project with complex network architecture, the project should contain microcontroller which communicates with server over internet and the webpage which demonstrate the sensors work in visual way. The project have to follow philosophy of internet of things.

Product Characteristics and Requirements:

1. The microcontroller have to:
   (a) transmit data over internet to the server
   (b) read data from Ultrosonic sensor
2. The server have to:
   (a) received data from microcontroller
   (b) keep data in the database
   (c) provide RESTfull API for webpage
   (d) be based on IBM BlueMix
3. The webpage have to:
   (a) be implement fluid-design
   (b) contain:
      i. legend
      ii. two donut chart
      iii. bar chart
      iv. plot
   (c) receive data from RESTfull API

Summary of Project Deliverables

Project management-related deliverables: the following documentation and any other documents required to manage the project.

1. Scope statement
2. WBS
3. Network diagram and critical path
4. Risk register and probability impact matrix
5. Communication plan
6. Cost baseline
7. Team contract
8. Project completion report

Product-related deliverables:

1. A project meeting the agreed specification
2. A design document detailing the project architecture
3. All software code
4. Final presentation

Non Project Deliverables

1. No guarantee of increased revenue for the project
2. The ongoing site maintenance following the completion of the project
3. The website hosting and hosting contract
4. The website launch

Project Success Criteria:

1. The project will be completion within 3 months.
2. All HTML and CSS to validate to W3C standards.
3. The project will be fully functional
4. The product will follow Product Characteristics and Requirements

Assumptions:

The project team will consist of a Sponsor(University) and Project Manager/Programmer(Alexey Tukalo) and Programmers(Gatan M., Florian Henriet).

3 Work Breakdown Structure

The PMBOK[1] describes the Work Breakdown Structure as "deliverable oriented hierarchical decomposition of the work to be executed by the project team". Basically, the WBS represents a project execution process as list of manageable sections.

Typically it is demonstrated as multiple level list of actions and milestones. Software for project management usually add timing/schedule, resources and team members columns to the WBS, this kind of table can be used for an automatic generation of a Gantt Chart. It is the main tool of project manager, because it contains the most important information for the project execution process.[3]

It is very important for settings of a schedule to take in an account different types of slacks and delays. Usually, they are handled via small buffers before key milestones and a big feeding buffer in the very end of project, right before the final deadline.

3.1 Work Breakdown Structure example

You can see an example of the Work Breakdown Structure below.

1. Idea creation
   1.1 Get requirements
   1.2 Create concept (brainstorm)

[1]The Project Management Body of Knowledge - industry standards for a complete project plan

- 1.3 Reconcile the project the concept with supervisor
- 1.4 Reconcile scope statement
- 1.5 Prepare abstract
- 1.6 Consept is ready

2. Planning
   - 2.1 Develop the architecture of system
   - 2.2 Identify the technologies
   - 2.3 Identify the details of data transmission
   - 2.4 Separate roles between team members
   - 2.5 Set deadlines for development
   - 2.6 Create resource list
   - 2.7 Order hardware
   - 2.8 Plan is ready
3. Development
   - 3.1 Webpage
     - 3.11 Create design
     - 3.12 Parse data
     - 3.13 Create layout
     - 3.14 Create donut charts
     - 3.15 Create bar chart
     - 3.16 Create plot
     - 3.17 Add legend
     - 3.18 Add tooltips
   - 3.2 Server
     - 3.21 Install MongoDB
     - 3.22 Set connection to IoT
     - 3.23 Create server logic at Node-red
     - 3.24 Turn on API for Web Page
   - 3.3 Sensor
     - 3.31 Install driver and set IDE
     - 3.32 Stick together hardware
     - 3.33 Read data from the sensor
     - 3.34 Send data to the server
   - 3.4 Integration of the system
     - 3.41 Test system together
     - 3.42 Fix problems
     - 3.43 System is integrated
4. Testing
   - 4.1 Test the system in real life case
   - 4.2 Confirm HTML and CSS code validate to W3C standards
   - 4.3 Test visualisation on different browsers and screen sizes
   - 4.4 Fix problems

4.5 Show result to supervisor and get feedback

4.6 Make final editions in according with supervisor's feedback

4.7 Testing is pasted

5. Closing

5.1 Prepare final report

5.2 Final presentation

5.3 Project is ready

4 Risk Register

Risk register gives an opportunity to predict possible problems and develop scenarios for the resolution of them. This part of project plan is very important for sponsors, because they can use it for an estimation of riskiness of the project and competence of the management team.[2]

Every entity in a risk register contains at least 8 fields:

- Name for the risk
- Short description of possible problems
- Combination of probability and impact of the risk (from low to high)
- An area affected by the problem (scope, schedule, quality, cost and so on)
- Probability that the event will occur (from low to high)
- Evaluation of possible influences (from low to high)
- Shortcut for the stakeholder responsible for resolving of the problem, list of the shortcuts is presented below the table
- Potential solution for the problem

4.1 Risk Register example

No	Risk	Description	Rank	Affected Areas	Probability	Impact	Owner	Potential Responses
1	Loss of funding	Loss of funding for hardware	Medium	Scope, Schedule	Low	Low	U	Use hardware already available at University
2	Teammate illness	Teammate is sick and not able to work	Medium	Schedule	Medium	Medium	T	Reallocate tasks of the sick teammate between other developers
3	Hardware problems	Hardware problems during development	High	Scope, Schedule, Cost	High	Low	T	Troubleshoot the device, repair or buy new
4	BlueMix failure	BlueMix Cloud is unavailable for some reason	High	Scope, Quality, Schedule, Cost	Low	High	B	Move server to other cloud or build own server

5	Aliens attack	Civilisation from far space captured control under the Earth	High	Scope, Quality, Schedule, Cost	Low	High	A	Join partisan detachments resistance, stop developing, the product is useless in case of Galactic war

Prepared by: Alexey Tukalo Date: February 15, 2016

Owners:

U	University	Project sponsor
T	Team	Project team
B	IBM BlueMix	Supplier
A	Aliens	Aliens from far space

5 Communication Plan

Communication is very a important part of a team cooperation. Project manager has to take care about cooperation inside team, an external communication and dialog between project owner and project team. Good team leader should take in an account that number of links between team members equals to the factorial of team members amount, so it grows very fast. In other side bigger teams or companies have an advantage in terms of external communication, because they are more flexible in terms of delegation of the communication responsibilities and more important players for their partners.[1]

Communication plan contains a schedule for all meetings, presentations, negotiations and other communication events between different part of project team during the project execution time. Some of them can be unique for an example a kick-off meeting or a finale presentation, another ones can be repeatable, for an example daily scrum meetings.

The plan also has to include list of key documents used to transfer information among stakeholders for example, the most important part of the list gives an information about documents which will be used to set the project requirements and report about the project results.[2]

5.1 Communication Plan example

Documents:

- List of the project requirements: list of requirements to the project from supervisor
- Concept of the project: detailed an explanation of the general idea behind the project.
- Plan of the system architecture: an abstract plan of the project's software and hardware implementations and a network diagram.
- Technical plan of the project: detailed plan of the project's software and hardware implementation.
- Format of the JSON object: example of the JSON object used to transmit data between components of the system.
- Plan of the development: Gantt chart with steps of development, responsible people and deadlines.
- Resource list: list of hardware resources required for realisation of the project prototype.
- Progress report: the Project Manager will maintain a record of project work and will record decisions made, along with budgetary and timeline monitoring.

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Method	Purpose	Responsibility	Audience	Frequency	Deliverable
Meeting	Get project requirements, ask question about unclear statements	Supervisor	Supervisor, Dev Team	Once off	List of the project requirements
Meeting (brainstorm)	Create the idea of the project in accordance with the specification	Project Manager	Dev Team	Once off	Concept of the project
Meeting	Discuss the project concept with supervisor, get advices and permission	Project Manager	Supervisor, Dev Team	Once off	Permission for a future development of the concept
Meeting	Reconcile the scope statement of the project with supervisor	Project Manager	Supervisor, Dev Team	Once off	Permission to start actual development of the system
Meeting (brainstorm)	Develop an architecture of the system	Project Manager	Dev Team	Once off	Plan of the system architecture
Meeting (brainstorm)	Identify the technological implementation of the architecture	Project Manager	Dev Team	Once off	Technical plan of the project
Meeting (brainstorm)	Identify the details of data transmission in the system	Project Manager	Dev Team	Once off	Format of the JSON object
Meeting	Spread the project into independent parts with equal scope and spread the roles between developers	Project Manager	Dev Team	Once off	Reconcile roles in the Dev Team
Meeting	Set deadlines, identify steps of the project development	Project Manager	Dev Team	Once off	Plan of the development (Gantt chart)
Meeting	Create a list of hardware for project implementation	Project Manager	Dev Team	Once off	Resource list
Meeting	Demonstrate results to the supervisor	Project Manager	Supervisor, Dev Team	Once off	Feedback from the supervisor
Presentation	Present project in University	Project Manager	Supervisor, Dev Team, other students and teacher	Once off	Feedback from the focus group
Skype conversation	Discuss particular development process and problems with teammates	All team member	Dev Team	any time	Exchange opinions with other teammate about particular problems, share results
Meeting	Discuss particular development process with supervisor	Project Manager	Supervisor, Dev Team	Weekly	Progress reports

6 Budget

Budget is usually based on the Work Breakdown Structure of the project. A project management software like Microsoft Project provides an extra column at the WBS table for costs. Detailed project budget gives an opportunity to make an accurate estimation of finale cost and meet it. Team leader has to avoid increasing of costs.[3]

Costs are able to raise because of extra slacks in schedule which leads to additional working hours and in result extra expenses to the staff's salary. They also can raise because of supplies problem, breakages of equipment, macro and micro economical or political issues. A budget gives an opportunity to detect extra costs, figure out the way to meet baseline budget or estimate new baseline.[3]

7 Conclusion

A plan is a fundamental part of project management. A planning is essential for an accurate cost estimation and setting of correct deadlines. Realistic deadlines are very good way of a project team motivation and mobilization. Moreover, it is a very important source of information for chiefs or investors, which makes comunication between project manager and project owners much more clear and easy.

In addition, a plan helps to resolve many types of conflicts related with accidental changes of the project scope. It also gives an opportunity to make a precise evaluation of the current project execution process and the project final results.

References

[1] "Number Theory in Science and Communication: With Applications in Cryptography, Physics, Digital Information, Computing, and Self-Similarity" by Manfred Schroeder

[2] "Managing Information Technology Projects" - Kathy Schwalbe

[3] support.office.com - tutorial for MS Project