Open-source software for Project Management
Project Management

“The application of knowledge, abilities, tools, and techniques to project activities aiming to reach its requirements.”

[PMBOK, 2013]
Project Management Process

Initiating Processes

Planning Processes

Monitoring & Controlling Processes

Execution Processes

Closing Processes

[PMBOK, 2013]
# Project Management Knowledge Areas

<table>
<thead>
<tr>
<th>Integration</th>
<th>Planning</th>
<th>Execution</th>
<th>Monitoring &amp; Controlling</th>
<th>Closing</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 Develop the project charter</td>
<td>4.2 Develop the project plan</td>
<td>4.3 Direct and manage the project work</td>
<td>4.4 Monitoring &amp; controlling the project work</td>
<td>4.6 Close the project or phase</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Scope</th>
<th>5.1 Plan scope management</th>
<th>5.2 Collect requirements</th>
<th>5.3 Define scope statement</th>
<th>5.4 Create WBS</th>
<th>5.5 Verify scope</th>
<th>5.6 Control scope</th>
</tr>
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<table>
<thead>
<tr>
<th>Time</th>
<th>6.1 Plan time management</th>
<th>6.2 Define activities</th>
<th>6.3 Sequence activities</th>
<th>6.4 Estimate activities resources</th>
<th>6.5 Estimate activities duration</th>
<th>6.6 Develop schedule</th>
<th>6.7 Control schedule</th>
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</table>

<table>
<thead>
<tr>
<th>Cost</th>
<th>7.1 Plan cost management</th>
<th>7.2 Estimate costs</th>
<th>7.3 Define budget</th>
<th></th>
<th>7.4 Control costs</th>
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</table>

<table>
<thead>
<tr>
<th>Quality</th>
<th>8.1 Plan quality management</th>
<th>8.2 Perform quality assurance</th>
<th>8.3 Control quality</th>
</tr>
</thead>
</table>

<table>
<thead>
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<th>HR</th>
<th>9.1 Plan HR management</th>
<th>9.2 Acquire project team</th>
<th>9.3 Develop project team</th>
<th>9.4 Manage project team</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Comunication</th>
<th>10.1 Plan communication management</th>
<th>10.2 Manage communications</th>
<th>10.3 Control communications</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Risks</th>
<th>11.1 Plan risk management</th>
<th>11.2 Identify risks</th>
<th>11.3 Perform qualitative risk analysis</th>
<th>11.4 Perform quantitative risk analysis</th>
<th>11.5 Plan risk responses</th>
<th>11.6 Control risks</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Procurements</th>
<th>12.1 Plan procurement management</th>
<th>12.2 Conduct procurements</th>
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<th>12.4 Close procurements</th>
</tr>
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</table>

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>11.1 Identify stakeholders</th>
<th>11.2 Plan stakeholders management</th>
<th>11.3 Manage stakeholders engagement</th>
<th>11.4 Control stakeholders engagement</th>
</tr>
</thead>
</table>

[PMBOK, 2013]
How to support PM process in practice?

- PM tools examples
  - dotProject
  - Microsoft Office Project
  - phpCollab
  - Oracle Primavera
  - project.net

- Typically supported functionalities:
  - Schedule development (Gantt chart)
  - Tracking of project activities development
  - Resources allocation
## Review of web-based PM tools

<table>
<thead>
<tr>
<th>Tool</th>
<th>Channel</th>
<th>Free or open-source software?</th>
<th>PMBOK Alignment</th>
<th>Scale</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Dimension</td>
<td></td>
<td>Does not offer any support</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Scope</td>
<td>Time</td>
<td>Cost</td>
</tr>
<tr>
<td>dotProject</td>
<td>No</td>
<td></td>
<td>**</td>
<td>**</td>
<td>*</td>
</tr>
<tr>
<td>dotProject +</td>
<td>Yes</td>
<td></td>
<td>*</td>
<td>**</td>
<td>*</td>
</tr>
<tr>
<td>MS Project</td>
<td>No</td>
<td></td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Server</td>
<td></td>
<td></td>
<td>**</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td>project.net</td>
<td>Yes</td>
<td></td>
<td>**</td>
<td>**</td>
<td>**</td>
</tr>
<tr>
<td>phpCollab</td>
<td>Yes</td>
<td></td>
<td>*</td>
<td>*</td>
<td>*</td>
</tr>
<tr>
<td>Primavera</td>
<td>No</td>
<td></td>
<td>**</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>Strebber</td>
<td>Yes</td>
<td></td>
<td>*</td>
<td>*</td>
<td>_</td>
</tr>
<tr>
<td>track+</td>
<td>Yes</td>
<td></td>
<td>*</td>
<td>*</td>
<td>_</td>
</tr>
</tbody>
</table>

[PEREIRA et al., 2013]
dotProject

- dotProject (www.dotproject.net) is a web-based tool to support the Project Management.

- It is an open-source project, available in:
  - Core: http://sourceforge.net/projects/dotproject/
  - add-on modules: http://sourceforge.net/projects/dotmods/

- Technologies: PHP + MySQL

- Large users community:
  - Multilingual support
  - + 15,000 downloads/month [SourceForge]
  - Forums: http://forums.dotproject.net/
dotProject – Overview

- Web-based tool for project management
- Users Management
- Internationalization
- Projects register
- Activities register
- Contact List
- Files repository
- Schedule (Gantt chart)
dotProject - Technologies

- PHP programming language
- MySQL Database management system
- Available on source forge
- Current version - 2.1.8
- First version released in 2000.
## Need for dotProject enhancement aligned with PMBOK

<table>
<thead>
<tr>
<th>PMBOK Knowledge areas</th>
<th>dotProject v. 2.1.8</th>
<th>dotProject+</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integration</td>
<td>-</td>
<td>***</td>
</tr>
<tr>
<td>Scope</td>
<td>*</td>
<td>**</td>
</tr>
<tr>
<td>Time</td>
<td>**</td>
<td>***</td>
</tr>
<tr>
<td>Cost</td>
<td>*</td>
<td>***</td>
</tr>
<tr>
<td>Quality</td>
<td>*</td>
<td>**</td>
</tr>
<tr>
<td>HR</td>
<td>*</td>
<td>***</td>
</tr>
<tr>
<td>Comunication</td>
<td>-</td>
<td>**</td>
</tr>
<tr>
<td>Risk</td>
<td>-</td>
<td>***</td>
</tr>
<tr>
<td>Procurement</td>
<td>-</td>
<td>**</td>
</tr>
<tr>
<td>Stakeholders</td>
<td>*</td>
<td>***</td>
</tr>
</tbody>
</table>

**Legend:**
- Does not offer any support
* Offers just a basic support
** Offers support to more most of processes.
*** Offers a complete support to all processes.
Why we chose dotProject for enhancement?

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extensibility</td>
<td>New functionalities may be added by add-on modules development.</td>
</tr>
<tr>
<td>Popularity</td>
<td>Among the open-source and web-based PM tools with more downloads [sourceforge.net].</td>
</tr>
<tr>
<td>PM process coverage</td>
<td>Among the open-source PM tools, shows to be the more aligned with PMBOK [PEREIRA et al. 2013].</td>
</tr>
<tr>
<td>Stability</td>
<td>This project is active since 2000, with a new release every year.</td>
</tr>
</tbody>
</table>
General Steps
Register an organization

Click here to register a new organization.

Companies

<table>
<thead>
<tr>
<th>sort by:</th>
<th>Company Name</th>
<th>Active Projects</th>
<th>Archived Projects</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>No companies available</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Register an organization

Attention: the organization that must be created at this moment is the one that are going to develop the project (not de customer organization).

After fill all data about the organization, you have to save the record.
Register human resources

1. Register organization
2. Register organization’s human resources
3. Identify the stakeholders
4. Develop the project charter
5. Assign the “Initiating” status
6. Register the project

Assign the “Canceled” status

Assign the “Planning” status

Yes: Project charter was approved?

No:

Write the scope statement

Develop the WBS

Create the WBS dictionary

Scope planning
At this moment you need to register the human resources. It is necessary because a resource needs to be allocated as project manager in the project charter.

At this moment, it is enough to register just the first name and the surname of each resource. More information may be added later during the HRs planning.
Create a project

It is from the project that the project charter and the project plan are going to be developed.
Create a project

Inform the project title and the organization.

Set the project status to "Initiating"

Information like: start date, end date, planned budget, and responsible do not need to be filled now. It will be automatically set after the project charter authorization.
Instrucional Feedback

The feedback aims to provide hints about some aspect that may be improved in the project charter or project plan that are been developed.

Notifications: are automatically delivered during dotProject+ usage.

There are two types of feedback:
- **Generic** - useful for any project.
- **Specific** - useful for term paper projects.

Each feedback is related to a knowledge area, identifying the module where it may be applied.

The delivered feedback are accumulated in the notification area, and remain there until you click on it, then reading its complete message.
Project initiation
Project charter inclusion

- Register organization
- Identify the stakeholders
  - Assign the "Canceled" status
  - No
  - Yes
  - Project charter was approved?
  - Project charter
- Assign the "Planning" status
- Write the scope statement
- Develop the WBS
- Create the WBS dictionary

Scope planning

- Developing project charter
- Scope planning
- Estimating project cost
- Efforts required
- Defining project goals
Project charter inclusion

The project charter is accessed in the "Initiation" tab.

When the project charter is been created, it is only necessary to inform who is going to be the project manager.
After creating the project charter it is necessary to include: justification, goals, expected results, premises, restrictions, etc.

<table>
<thead>
<tr>
<th>Project title</th>
<th>Pizza System - Uncle Chico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Justification</td>
<td>The Uncle Chico pizza is located in Downtown of Silicio's Island. In the east side of this island there is an ascendent demand for pizzas, and the Uncle Chico wants to meet this demand.</td>
</tr>
</tbody>
</table>
| Expected Results | - Web module.  
- Mobile module.  
- Tranning of Uncle Chico employees. |
| Restrictions | The system may be delivered in the begin of the first semester. |
| Start Date | 14/03/2016 |
| Milestones | - Delivery of web module.  
- Delivery of mobile module. |
| End Date | 01/09/2016 |
| Budget (R$) | 30000 |
| Objectives | Develop a computational system, available for web and mobile access, which customers may request some pizza, and the delivers may search the requests content, such as the customer address and requested items. |
| Premises | Uncle Chico will provide all necessary hardware, such as mobile phones and computers. |
| Criteria for success | Be completed developed until de deadline, and not overrun the budget. |
Approval and authorization workflow
Project charter inclusion

<table>
<thead>
<tr>
<th>Project title: Pizza System - Uncle Chico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Justification: The Uncle Chico pizza is located in Downtown of Silicio's Island. In the east side of this island there is an ascendent demand for pizzas, and the Uncle Chico wants to meet this demand.</td>
</tr>
<tr>
<td>Expected Results: - Web module. - Mobile module. - Training of Uncle Chico employees.</td>
</tr>
<tr>
<td>Restrictions: The system may be delivered in the begin of the first semester.</td>
</tr>
<tr>
<td>Start Date: 14/03/2016</td>
</tr>
<tr>
<td>Milestones: - Delivery of web module. - Delivery of mobile module.</td>
</tr>
<tr>
<td>Budget (R$): 30000</td>
</tr>
<tr>
<td>Status: Authorized</td>
</tr>
</tbody>
</table>

The approval workflow includes the following status: draft, completed, approved, authorized.

The project charter status may be altered using these action buttons.

The project charter must be authorized to go on with the project plan.
After "authorize" the project charter it status is automatically changed to "Planning".

The project fields: start date, end date, planned budget, and responsible are automatically set based on the information of the authorized project charter.
# Project charter inclusion

<table>
<thead>
<tr>
<th>Project title:</th>
<th>Pizza System - Uncle Chico</th>
</tr>
</thead>
<tbody>
<tr>
<td>Justification:</td>
<td>The Uncle Chico pizza is located in Downtown of Silicio’s Island. In the east side of this island there is an ascendant demand for pizzas, and the Uncle Chico wants to meet this demand.</td>
</tr>
</tbody>
</table>
| Expected Results: | - Web module.  
- Mobile module.  
- Training of Uncle Chico employees. |
| Restrictions: | The system may be delivered in the begin of the first semester. |
| Start Date | 14/03/2016 |
| Milestones: | - Delivery of web module.  
- Delivery of mobile module. |
| Project Manager: | Sponge Bob |
| Objectives: | Develop a computational system, available for web and mobile access, which customers may request some pizza, and the deliverer may search the requests content, such as the customer address and requested items. |
| Premises: | Uncle Chico will provide all necessary hardware, such as mobile phones and computers. |
| Budget (RS): | 30000 |
| End Date | 01/09/2016 |
| Criteria for success: | Be completed on time and within budget. |

When the project charter is concluded, it may be exported to PDF clicking in this link.

This document must be delivered as a result, indicating the team has developed the project charter.
Stakeholders identification
Stakeholders identification

After the project charter have been authorized, it is necessary to register the stakeholders.

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Responsibilities</th>
<th>Interest</th>
<th>Power</th>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sponge Bob</td>
<td>Manage the project</td>
<td>High</td>
<td>High</td>
<td>Keep constantly informed about progress.</td>
</tr>
</tbody>
</table>
Register the identified stakeholders

| Stakeholder | First Name: Sponge | Last Name: Bob | Responsibilities: Manage the project | Power: High | Interest: High | Strategy: Keep constantly informed about progress. |

The strategy is automatically suggested based on the identified interest and power. Yet, it may be adapted for each stakeholder.
Project planning

Scope  Quality
Time  Communication
Costs  Risk
Human Resources  Procurement
Scope planning
Scope statement

1. Register organization
2. Identify the stakeholders
3. Develop the project charter
4. Assign the "Initiating" status
5. Register the project
6. Assign the "Planning" status
7. Project charter was approved?
8. Write the scope statement
9. Develop the WBS
10. Create the WBS dictionary

Scope planning
Scope statement

Register the scope statement in this area.

Right click on WBS, then select this option.

Scope Statement

This project aims to develop a computational system where customers may request their pizza, and employees may verify these requests when preparing and delivering each request.

This system is composed of two main modules:

Web module: A web page which customers may inform their requests, selecting the pizza information, such as flavor and size, select the drink, and also inform the address for delivery.

Mobile module: An app accessed from smart phones, which employees may consult the request information when in field delivering pizzas.
WBS development

1. Register organization
2. Register organization's human resources
3. Identify the stakeholders
4. Develop the project charter
5. Assign the "Initiating" status
6. Register the project
7. Assign the "Planning" status
8. Project charter was approved?
9. Yes: Develop the WBS
10. Write the scope statement
11. Create the WBS dictionary

Scope planning

Prof. Dr. Christiane G. von Wangenheim, PMP
WBS development

- The WBS is created using a hierarchical structure.

Use the right click menu to see the available options.

Here is available actions to include, edit, and exclude WBS items.

Sort the WBS items.
The WBS dictionary supports the detailing of all WBS items. Utilize this option to access the WBS dictionary.

In the WBS dictionary, you may record a detailed description of each WBS item.
Time planning
Time planning

1. Define activities
2. Sequence activities
3. Carry out estimate meetings
4. Estimate roles for project activities
5. Effort estimation
6. Schedule development
7. Register roles
8. Configure organizational diagram
9. Estimate project costs
10. Define the project budget
Define the project activities

New activities may be included for each project work package.

Utilize the right click menu to include a new activity to the project.

The WBS is utilized as basis for the derivation of project activities.
Time planning

1. Write the scope statement
2. Develop the WBS
3. Create the WBS dictionary
4. Define activities
5. Sequence activities
6. Carry out estimate meetings
7. Estimate roles for project activities
8. Effort estimation
9. Schedule development
10. Register roles
11. Configure organizational diagram

Estimate project costs
Define the project budget
The sequencing of a project activity is carried out by the relationship of an activity with its predecessors.

Using these functionalities you may include and exclude predecessor to an activity.

A Gantt chart is presented in the inferior part of this screen, assisting with the graphical visualization of the activities sequencing.

Click on the "Sequence activities" button to access this functionality.
Time planning

1. Define activities
2. Sequence activities
3. Carry out estimate meetings
4. Estimate roles for project activities
5. Effort estimation
6. Schedule development
   - Register roles
   - Configure organizational diagram

Additional processes:
- Write the scope statement
- Develop the WBS
- Create the WBS dictionary
- Estimate project costs
- Define the project budget

Scope planning  Time planning  Costs planning
To register the HRs estimations, it is necessary to define the roles that are available in the organization. Roles examples are: System analyst, junior/senior programmer, tester, project manager, among others.
Creating a role

When a role is created, you have to inform its name, and its responsibilities, authorities, and competencies.

<table>
<thead>
<tr>
<th>Quality Software Group</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Role name:</strong> Project Manager</td>
</tr>
<tr>
<td><strong>Role responsibility:</strong></td>
</tr>
<tr>
<td>Develop the project plan.</td>
</tr>
<tr>
<td>Get the project plan approved by project sponsor.</td>
</tr>
<tr>
<td>Select the project team.</td>
</tr>
<tr>
<td>Control the project work.</td>
</tr>
<tr>
<td><strong>Role authority:</strong></td>
</tr>
<tr>
<td>Allocate team members in project activities.</td>
</tr>
<tr>
<td>Request acquisitions of items necessary to the project</td>
</tr>
<tr>
<td>Dismiss team members.</td>
</tr>
<tr>
<td><strong>Role competence:</strong></td>
</tr>
<tr>
<td>Interpersonal abilities.</td>
</tr>
<tr>
<td>General knowledge in the project application area.</td>
</tr>
<tr>
<td>Project Management knowledge.</td>
</tr>
</tbody>
</table>
Time planning

1. Write the scope statement
2. Develop the WBS
3. Create the WBS dictionary
4. Define activities
5. Sequence activities
6. Carry out estimate meetings
7. Estimate roles for project activities
8. Effort estimation
9. Schedule development
10. Register roles
11. Configure organizational diagram

Estimate project costs
Define the project budget

Scope planning  Time planning  Costs planning
Define the organizational diagram

After have defined the project roles, you may build the organizational diagram.

In the development of the organizational diagram are available all defined roles for this organization.
Time planning

1. Write the scope statement
2. Develop the WBS
3. Create the WBS dictionary
4. Define activities
5. Sequence activities
6. Carry out estimate meetings
7. Estimate roles for project activities
8. Effort estimation
9. Schedule development
10. Register roles
11. Configure organizational diagram
12. Estimate project costs
13. Define the project budget
Estimate human resources

After defining the organizational diagram, all defined roles are available to be estimated for project activities.

Attention! Only the roles included in the organizational diagram are available to be estimated. It means, roles created but not included in the organizational diagram would not appear in this list.
Time planning

1. Define activities
2. Sequence activities
3. Carry out estimate meetings
4. Estimate roles for project activities
5. Effort estimation
6. Schedule development
7. Register roles
8. Configure organizational diagram

Estimate project costs
Define the project budget

Write the scope statement
Develop the WBS
Create the WBS dictionary

Scope planning
Time planning
Costs planning

Rafael Queiroz Gonçalves, M.Sc.
Prof. Dr. Christiane G.von Wangenheim, PMP
Register the estimation minutes

The estimation meetings are registered using minutes.

Here is presented the history of all estimation meetings.
Registering the estimation meetings

It is registered what was estimated in this meeting.

You may indicate who was presented in this meeting.

Description of what was discussed and its results.

<table>
<thead>
<tr>
<th>Type:</th>
<th>Effort</th>
<th>Duration</th>
<th>Resources (roles)</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date:</td>
<td>14/03/2016</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

All members

- Mr Plankton

Participants

- Sponge Bob
- Patrick Star

The presented individuals are related to project stakeholders.

In case some participant is not presented, return to stakeholders module to include him.

It was estimated the effort for the development of the mobile module, including functionalities to view the open requests, and to verify its details.

It was adopted the planning poker technique.
Time planning

Write the scope statement

Develop the WBS

Create the WBS dictionary

Define activities

Sequence activities

Carry out estimate meetings

Estimate roles for project activities

Effort estimation

Schedule development

Register roles

Configure organizational diagram

Estimate project costs

Define the project budget

Scope planning

Time planning

Costs planning
Register the estimate information

First, it is estimated the size of work packages, which may be estimated using any unit.

After, it is estimated the activities effort, resources, and then its duration.
Time planning

1. Write the scope statement
2. Develop the WBS
3. Create the WBS dictionary
4. Define activities
5. Sequence activities
6. Carry out estimate meetings
7. Estimate roles for project activities
8. Effort estimation
9. Schedule development
10. Register roles
11. Configure organizational diagram
12. Estimate project costs
13. Define the project budget
Schedule development

After have completed the activities estimations, the schedule is presented in Gantt chart format, for the complete period of project duration.
Costs planning
Estimate costs

The human resources are automatically included based on their allocation in project activities (RH planning).

Record the costs estimations for human resources.

Record the estimates for the non-human resources.

The non-human resources may be included using this button.
Estimate costs - Human resources

For each human resource allocated in the project, it is necessary to estimate its costs.

<table>
<thead>
<tr>
<th><strong>Project:</strong> Pizza System - Uncle Chico</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Edit</strong></td>
</tr>
<tr>
<td><strong>Register of human resource</strong></td>
</tr>
<tr>
<td><strong>Name:</strong> Patrick Star - Programmer</td>
</tr>
<tr>
<td><strong>Date Begin</strong>: 14/03/2016</td>
</tr>
<tr>
<td><strong>Date End</strong>: 14/04/2016</td>
</tr>
<tr>
<td><strong>Hours per Month</strong>: 80</td>
</tr>
<tr>
<td><strong>Unitary Value (R$)</strong>: 89.00</td>
</tr>
<tr>
<td><strong>Total Value (R$)</strong>: 7120.00</td>
</tr>
</tbody>
</table>

* Required Fields
* HRs are automatically included in cost baseline. Is is not possible to exclude them directly. Their exclusion happens as they are unallocated from all project activities.

Inform the period which this resource will work in the project, and how many hours per month he is going to work in the project.
Estimate costs - Non human resources

The non human resources are registered during the costs estimations.

It is necessary to inform the resource name, its quantity, unitary value, and the period in which this resource are going to be utilized.
Costs planning

- Define the roles
- Update the organizational diagram
- Define the project team
- Allocate human resources

Register roles
Configure organizational diagram

Costs planning

Estimate project costs
Define the project budget
Document the costs baseline

After estimating the costs with human and non-human resources, the budget is elaborated based on the costs baseline.

Click in the "Budget" button to access this functionality.
Document the costs baseline

The baseline period is defined based on the project start and end dates.

It is necessary to estimate the contingency reserve for all risks that have demands some contingency action.

<table>
<thead>
<tr>
<th>Year</th>
<th>03</th>
<th>04</th>
<th>05</th>
<th>06</th>
<th>07</th>
<th>08</th>
<th>Total Cost (R$)</th>
</tr>
</thead>
</table>
| Item | Item  
| HUMAN RESOURCE ESTIMATIVE  
Patrick Star - Programmer | 1.00 | 1.00 | 1.00 | 1.112,50 | 6.675,00 |
Patrick Star - System Analyst | —— | —— | —— | 0,00 | 7.120,00 |
Sponge Bob - Project Manager | —— | —— | —— | 562,50 | 3.375,00 |
| Subtotal human resources estimatives (R$): | 5.667,00 | 1.675,00 | 17.170,00 |
| NON-HUMAN RESOURCE ESTIMATIVE  
Mobile devices | 0,00 | 990,00 | 990,00 | 990,00 | 990,00 | 0,00 | 3.960,00 |
Notebook | 630,00 | 630,00 | 630,00 | 630,00 | 630,00 | 630,00 | 3.780,00 |
| Subtotal non human resources estimatives (R$): | 630,00 | 1.620,00 | 1.620,00 | 1.620,00 | 1.620,00 | 630,00 | 7.740,00 |
| CONTINGENCY RESERVE  
Programmer leave the project | 166,67 | 166,67 | 166,67 | 166,67 | 166,67 | 166,67 | 1.000,00 |
| Subtotal Contingency (R$): | 166,67 | 166,67 | 166,67 | 166,67 | 166,67 | 166,67 | 1.000,00 |
| TOTAL (R$): | 7.930,00 | 18.365,00 | 18.365,00 | 18.365,00 | 18.365,00 | 18.365,00 | 18.365,00 |
Document the budget estimations

Based on the risks planning, the contingency reserve is estimated.

Form to register the contingency reserve for a risk.

For each reserve contingency you may inform its financial impact, and the date period when the risk may occur.
Document the budget estimations

The management reserve is estimated based on percentages over the project costs.

Total budget is automated calculated based on the defined management reserve.
Human resources planning
HR planning

Planning

- Define the roles
- Update the organizational diagram
- Define the project team
- Allocate human resources

Costs planning

- Estimate project costs
- Define the project budget

Human resources planning

- Plan risks management
- Identify risks
- Perform qualitative analysis
- Plan risks responses

Risks planning
The roles configuration is accessed using the company form.

Register for each role its competencies, authorities, and responsibilities.
After create all project roles, it is necessary to indicate the roles each team member may assume.
HR Planning

Roles it may assume:

- Project Manager

Link for its online curriculum:
spongebob.com

Availability:

Weekday working hours:
- Sunday: 0
- Monday: 8
- Tuesday: 8
- Wednesday: 8
- Thursday: 8
- Friday: 8
- Saturday: 0

Human resource cost:

<table>
<thead>
<tr>
<th>Date Begin</th>
<th>Date End</th>
<th>Standard Rate (R$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/03/2016</td>
<td>31/12/2016</td>
<td>45,00</td>
</tr>
</tbody>
</table>

Hour/rate value

Add more rows as needed.
HR planning

Planning

Costs planning

Define the roles

Update the organizational diagram

Define the project team

Allocate human resources

Human resources planning

Plan risks management

Identify risks

Perform qualitative analysis

Plan risks responses

Risks planning
HR planning

For every activity which have roles estimated, you may allocate HRs.

dotProject+ already suggest to allocate the team members which have the same role as the ones estimated for the activity.

After configured all team members, you may allocate them in project activities.
HR planning – Need for training

Specify any need for training of project team members.

The project team must be trained in the development for mobile platform. It is because despite their expertise in the development of web applications, they still lack of experience with mobile development. The training has to be focused on the Android OS, because the customer has chosen to adopt these devices.
Risks planning
In the risks management plan are defined how the risks are going to be identified, registered and managed.
## Risks planning

### Risk Management Plan

**Impact and Probability Definitions**

<table>
<thead>
<tr>
<th>Probability</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Low</td>
<td>A similar risk happens once in another organization.</td>
</tr>
<tr>
<td>Low</td>
<td>A similar risk happens once in a similar organization.</td>
</tr>
<tr>
<td>Medium</td>
<td>A similar risk happens once in this organization.</td>
</tr>
<tr>
<td>High</td>
<td>A similar risk happens a few times in this organization.</td>
</tr>
<tr>
<td>Very High</td>
<td>A similar risk happens many times in this organization.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Impact</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very Low</td>
<td>The impact may be ignored.</td>
</tr>
<tr>
<td>Low</td>
<td>The impact is minimum and may be handled by the default procedure.</td>
</tr>
<tr>
<td>Medium</td>
<td>Major event and with some effort may be handled by the default procedure.</td>
</tr>
<tr>
<td>High</td>
<td>Critical event, may generate some cost or delay in the project.</td>
</tr>
<tr>
<td>Very High</td>
<td>Extreme event, may generate cost or delay, or jeopardize organizational image.</td>
</tr>
</tbody>
</table>

### Probability and Impact Matrix

| Impact | Probability | Very Low | Low | Medium | Very Low | Low | Medium | Very Low | Low | Medium | Very Low | Low | Medium | Very Low | Low | Medium | Very Low | Low | Medium | Very Low | Low | Medium | Very Low | Low | Medium | Very High |
|--------|-------------|----------|-----|--------|----------|-----|--------|----------|-----|--------|----------|-----|--------|----------|-----|--------|----------|-----|--------|----------|-----|--------|----------|-----|--------|----------|-----|--------|----------|-----|--------|
| Very Low| Low         | ▼        | ▼   |        | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      |
| Low    | Low         | ▼        | ▼   |        | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      |
| Medium | Low         | ▼        | ▼   |        | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      |
| High   | Medium      | ▼        | ▼   |        | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      |
| Very High| Medium     | ▼        | ▼   |        | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      | ▼        | ▼   | ▼      |

Indicates the criteria that have to be adopted when classifying a risk in relation to its probability and impact.

Defines the probability x impact matrix, indicating the exposition factor, utilized for risks prioritization.

The risks management plan already are filled with default values, which may be adapted for each project.
The Risks Breakdown Structure (RBS) has to be defined for risks classification.
Risks planning

1. Define the roles
2. Update the organizational diagram
3. Define the project team
4. Allocate human resources

Plan risks management

1. Identify risks
2. Perform qualitative analysis
3. Plan risks responses

Plan communications

Plan quality

Plan procurements

Generate the project plan

Project plan
Risks planning

Registering the identified risks.
The risks are documented accordingly its causes and consequences.

The risks duration is identified and it is classified accordingly the RBS.
Risks planning

1. Define the roles
2. Update the organizational diagram
3. Define the project team
4. Allocate human resources

Plan risks management

1. Identify risks
2. Perform qualitative analysis
3. Plan risks responses

Plan communications
Plan quality
Plan procurements
Generate the project plan

Human resources planning
Risks planning

Rafael Queiroz Gonçalves, M.Sc.
Prof. Dr. Christiane G.von Wangenheim, PMP
Risks planning

Register the estimations for risk qualitative analysis. The exposition factor is automatically filled based on the probability and impact matrix.

Risk Qualitative Analysis

<table>
<thead>
<tr>
<th>Probability:</th>
<th>Low ▼</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact:</td>
<td>High ▼</td>
</tr>
<tr>
<td>Importance:</td>
<td>Medium</td>
</tr>
</tbody>
</table>

Risk Response Plan

<table>
<thead>
<tr>
<th>Strategy:</th>
<th>Mitigate ▼</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevention action:</td>
<td>Offer a good rewarding to the programmer</td>
</tr>
<tr>
<td>Include in contingency reserve:</td>
<td>Yes ▼ No</td>
</tr>
<tr>
<td>Contingency plan:</td>
<td>Ask the programmer to work from home office, then he may continue working in the project activities.</td>
</tr>
<tr>
<td>Trigger:</td>
<td>Programmer informs he needs</td>
</tr>
<tr>
<td>Owner:</td>
<td>Sponge Bob ▼</td>
</tr>
</tbody>
</table>

Attention! For a risk be included in the costs baseline, it is necessary to include it in the contingency reserve.

The information related to the risk response plan also may be registered accordingly the adopted answer strategy (mitigate, accept, transfer, avoid).
Communication planning
Communication planning

Define the roles
Update the organizational diagram
Define the project team
Allocate human resources

Plan communications
Plan risks management
Identity risks
Perform qualitative analysis
Plan risks responses

Plan quality
Plan procurements
Generate the project plan

Human resources planning
Risk planning
First, it is necessary to define the communication channels and the frequencies.
**Communication planning**

**Communications**

<table>
<thead>
<tr>
<th>List of Communications</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communication Title:</strong></td>
</tr>
<tr>
<td><strong>Communication:</strong></td>
</tr>
<tr>
<td><strong>Issuing:</strong></td>
</tr>
<tr>
<td><strong>Issuing:</strong></td>
</tr>
<tr>
<td><strong>Receptor:</strong></td>
</tr>
<tr>
<td><strong>Receptor:</strong></td>
</tr>
<tr>
<td><strong>Receptor:</strong></td>
</tr>
<tr>
<td><strong>Channel:</strong></td>
</tr>
<tr>
<td><strong>Frequência:</strong></td>
</tr>
<tr>
<td><strong>Restrictions:</strong></td>
</tr>
<tr>
<td><strong>Responsible Authorization:</strong></td>
</tr>
</tbody>
</table>

Define the communication title.

The options for the channel and frequency are dynamic accordingly the previous configurations.
Quality planning
Quality planning

1. Define the roles
2. Update the organizational diagram
3. Define the project team
4. Allocate human resources
5. Plan risks management
6. Identify risks
7. Perform qualitative analysis
8. Plan risks responses
9. Plan communications
10. Plan quality
11. Plan procurements
12. Generate the project plan
13. Project plan

Human resources planning
Risk planning
Define the approach for project quality assurance, creating audit items.

Identify the norms, policies, and guidelines which the project must comply.

### Standards, Policies, Guidelines:

The project must attend the CMMI-DEV level 2, particularly the project planning and requirements management process areas. The project must be implemented adopting the OPEN-SQL standard.

### Approach to quality assurance

*Quality assurance: process to evaluate the general performance to meet the quality norms.*

<table>
<thead>
<tr>
<th>What audit</th>
<th>Who audit</th>
<th>When audit</th>
<th>How audit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Requirements Management</td>
<td>Monthly</td>
<td>SCAMPI</td>
<td>External Auditor</td>
</tr>
</tbody>
</table>
Quality planning

Define the approach for project quality control.

The goals of control are defined for each requirement, following the GQM approach: specifying the goals, the questions of analysis, and the metrics.

Record the requirements for project quality.
Procurements planning
Procurements planning

1. Define the roles
2. Update the organizational diagram
3. Define the project team
4. Allocate human resources

5. Plan procurements
6. Plan communications
7. Plan quality
8. Plan risks management
9. Identity risks
10. Perform qualitative analysis
11. Plan risks responses
12. Generate the project plan

Human resources planning
Risk planning

Project plan

Rafael Queiroz Gonçalves, M.Sc.
Prof. Dr. Christiane G.von Wangenheim, PMP
### Procurements planning

#### Acquisitions planning

<table>
<thead>
<tr>
<th>Item to be acquired</th>
<th>Contract type</th>
<th>Documents to acquisition (DT, etc.)</th>
<th>Criteria for suppliers selection (Criteria and weight)</th>
<th>Addition requirements, assumptions, and constraints etc.:</th>
<th>Suppliers management processes:</th>
<th>Roles/Responsibilities to acquisition:</th>
</tr>
</thead>
<tbody>
<tr>
<td>web designer</td>
<td>Fixed Price</td>
<td>The work to be carried out includes the following items: 1. Development of screens for customers perform new requests, and a screen for employees see open requests. 2. Follow the pizzeria identity in the proposed screens.</td>
<td>Formation (peso: 1) Hour/rate (peso: 1) Availability (peso: 1)</td>
<td>The service must be concluded within 2 months</td>
<td>1. Request a quote 2. Quote evaluation 3. Confirm the quote acceptance 4. Allocate the hired resources 5. Track the work execution. 6. Payment 7. Contract closure.</td>
<td>Project Manager: Track the work execution. Hired professional: Carry out the work him was hired for.</td>
</tr>
</tbody>
</table>

---

**List of items to be acquired.**
## Procurements planning

**Form to register a new item to be acquired.**

### Acquisitions planning

**Item to be acquired:** web designer

**Contract type:** Fixed Price

**Documents to acquisition (DT, etc.):**

The work to be carried out includes the following items:
1. Development of screens for customers perform new requests, and a screen for employees see open requests.
2. Follow the pizzeria identity in the proposed screens.

**Criteria for suppliers selection (Criteria and weight):**

<table>
<thead>
<tr>
<th>Add criteria</th>
<th>Formulation</th>
<th>1 ∨</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hour/rate</td>
<td>1 ∨</td>
</tr>
<tr>
<td></td>
<td>Availability</td>
<td>1 ∨</td>
</tr>
</tbody>
</table>

**Addition requirements, assumptions, and constraints etc.:**

The service must be concluded within 2 months

**Suppliers management processes:**

1. Request a quote
2. Quote evaluation
3. Confirm the quote acceptance
4. Allocate the hired resources
5. Track the work execution.
6. Payment

**Roles/Responsibilities to acquisition:**

<table>
<thead>
<tr>
<th>Add role/responsibility</th>
<th>Project Manager</th>
<th>Track the work execution.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hired professional</td>
<td>Carry out the work him was hired for.</td>
</tr>
</tbody>
</table>

[Screenshot of the form]

---

Rafael Queiroz Gonçalves, M.Sc.
Prof. Dr. Christiane G.von Wangenheim, PMP
Export the project plan

- Define the roles
- Update the organizational diagram
- Define the project team
- Allocate human resources
- Plan risks management
- Identity risks
- Perform qualitative analysis
- Plan risks responses
- Plan communications
- Plan quality
- Plan procurements
- Generate the project plan

Project plan
Export the project plan

Clicking in the "Project plan" link, it is generated a structured report containing all information related to the project plan.
Export the project plan

In the inferior part of the opened page, there is a link to export the project plan to a PDF file.

This PDF must be delivered as a result, evidencing the team has developed the project plan.
Project Team

Institution:
GQS/INCoD/INE/UFSC

Coordinator:
Prof. Dr. rer. nat. Christiane Gresse von Wangenheim, PMP

Technical team:
André Marques Pereira
Rafael Queiroz Gonçalves
Deise Luise Wrasse
Elisa de Freitas Kühlkamp
Lara Wilpert
Rafael Reiter
Sérgio M. de Oliveira Abreu
Suzana Vilas Boas Pescador
Thaisa Cardoso Lacerda
Our results are useful?

Available for download in the dotProject official repository for add-on modules.

sourceforge.net/projects/dotmods/
Directory: Alignment with PMBOK and CMMI-DEV

Total of 18,774 downloads until February 2016.
## Status of the program of projects to enhance dotProject

<table>
<thead>
<tr>
<th>Module</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initiation</td>
<td>Concluded</td>
</tr>
<tr>
<td>Scope planning</td>
<td>Concluded</td>
</tr>
<tr>
<td>Time planning</td>
<td>Concluded</td>
</tr>
<tr>
<td>Cost planning</td>
<td>Concluded</td>
</tr>
<tr>
<td>Communication planning</td>
<td>Concluded</td>
</tr>
<tr>
<td>HR planning</td>
<td>Concluded</td>
</tr>
<tr>
<td>Quality planning</td>
<td>Concluded</td>
</tr>
<tr>
<td>Risks planning</td>
<td>Concluded</td>
</tr>
<tr>
<td>Procurements planning</td>
<td>Concluded</td>
</tr>
<tr>
<td>Monitoring and Controlling</td>
<td>Concluded</td>
</tr>
<tr>
<td>Closing</td>
<td>Concluded</td>
</tr>
<tr>
<td>Instructional Feedback</td>
<td>Under development</td>
</tr>
</tbody>
</table>
Send us your comments and evaluation

If you are a **student**, evaluate dotProject+ and this material accessing the link:  

If you are a **professor**, evaluate dotProject+ and this material accessing the link:  

---

**Survey**

Avaliação da qualidade da Unidade Instrucional para o Gerenciamento de Projetos - Ponto de vista do docente

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* Em qual disciplina você lecionou a Unidade Instrucional?  

**Vocês**  
Escolha uma das seguintes opções:  

- Sim  
- Não  

---

Send us your feedback!  
Improvement suggestions may be sent, such as report of bugs.
More information

- dotProject+   www.gqs.ufsc.br/evolution-of-dotproject
- dotProject: dotproject.net | sourceforge.net/projects/dotproject
- Dotmods: sourceforge.net/projects/dotmods
- Guia livre: www.governoeletronico.gov.br/anexos/guia-livre-versao-1.0

Publications

- GONÇALVES, R. Q.; GRESSE VON WANGENHEIM, C. Comparison of Educational Project Management Tools. 10th International Conference on Software Engineering Advances (ICSEA 2015), Barcelona/Spain, 2015.
- REITER, Rafael; GONÇALVES, Rafael; WANGENHEIM, Christiane. Planejamento de Custos Suportado pela Evolução de uma Ferramenta de Gerenciamento de Projetos. X Simpósio de Excelência em Gestão e Tecnologia (SeGET), Resende/Brazil, 2013.
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Christiane Gresse von Wangenheim – c.wangenheim@ufsc.br

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