IT Project Management

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1 Introduction

1.1 Definition of a project :

Definition :

> The endeavor undertaken to satisfy a corporate need or objective : temporary work with start and end that deliver a product to a client and that respect scopes.

The three most important constraints of a project, coming from ressources and quality are:

- cost
- time : it could not be an on-going process
- scope : the product we need to deliver and all the interrelated workpackages undertaken to produce a product

If one of these three is modified, the two others are directly impacted.

1.2 Why does a project success or fail ?

Beside the fact that a project success depends on the respect of the three main constraints, the success of a project depends of mostly these three "events" ($\geq$50%):

1. user involvement (if the project is finally used)
2. executive management support (sufficient financial support)
3. clear statement of requirements

Failed projects are usually due to lack of user input or incomplete/changing requirements. So it's very important to precise what are all the why, what, when and how of the project. **A project is a success only if the project deliver a benefit to the client, even all the three conditions have been complete.**

1.3 Advantages of project management :

Organize well a project isn't so easy but it can increase the guarantee (without ensure it) of the succcess of a project, to be aware of all the constraints and the required ressources like tools, ressources or quality. Do a good project management for one project can help for the future ones by keeping ideas that made the project successful or in the other case, understand why it failed and how fix that for the next one.

2 Planning a project

Some essential things to consider when beginning a project :

1. background
2. stakeholders
3. scope
4. deliverables
5. project assumptions
6. methodology
7. WBS

3 The background

The background is a tiny summary of the background of the company that is going to build the project, why it will make the project and why it is the best company to make it. It never takes more than one-side sheet and usually is developped on two paragraphs.

4 The stakeholders

Definition

> Stakeholders are the people involved in or affected by project activities. To lead the participants in a project effectively, you must understand who the stakeholders are and what their attitudes are toward the project.

There are two types of stakeholders :

4.1 Internal :

The internal stakeholders are people who are directly involved in the project

- Owners :
- Users : people who is responsible for the day-to-day details and decisions to the project
- Project sponsor : guardian of the business vision, negotiator, communication link to executive management
- Team members : responsible for day to day delivery of tasks and has input into the solution
- Project manager : primary contact between the firm and the clients and is responsible for the deliverables, human resources and project success
- Team leader : responsible for a group team members within a specialized area and responsible for ensuring deliverables are me

4.2 External :

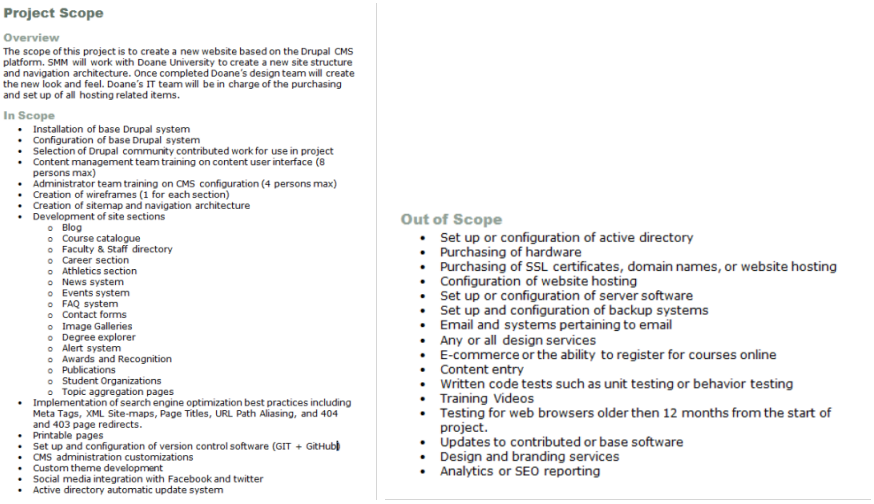
The external stakeholders are people are not involved in the project at all, however, indirectly could affect the projects outcome.

- Labor unions
- Government
- External customers
- Financial institutions
- Consumer groups
- Special interest groups
- Suppliers

5 Scope

The project's scope is the combination of all project goals and tasks, and the work required to accomplish them. The scope answers to these questions :

- What marks the end of the project?
- What lies within the scope of the project?
- What definitely does not lie within the scope?
- What are the project quality measures?
- What is NOT in scope ?



Project Scope

Overview

The scope of this project is to create a new website based on the Drupal CMS platform. SMM will work with Doane University to create a new site structure and navigation architecture. Once completed Doane's design team will create the new look and feel. Doane's IT team will be in charge of the purchasing and set up of all hosting related items.

In Scope

- Installation of base Drupal system
- Configuration of base Drupal system
- Selection of Drupal community contributed work for use in project
- Content management team training on content user interface (8 persons max)
- Administrator team training on CMS configuration (4 persons max)
- Creation of wireframes (1 for each section)
- Creation of sitemap and navigation architecture
- Development of site sections
  - Blog
  - Course catalogue
  - Faculty & Staff directory
  - Career section
  - Athletics section
  - News system
  - Events system
  - FAQ system
  - Contact forms
  - Image Galleries
  - Degree explorer
  - Alert system
  - Awards and Recognition
  - Publications
  - Student Organizations
  - Topic aggregation pages
- Implementation of search engine optimization best practices including Meta Tags, XML Site-maps, Page Titles, URL Path Aliasing, and 404 and 403 page redirects.
- Printable pages
- Set up and configuration of version control software (GIT + GitHub)
- CMS administration customizations
- Custom theme development
- Social media integration with Facebook and twitter
- Active directory automatic update system

Out of Scope

- Set up or configuration of active directory
- Purchasing of hardware
- Purchasing of SSL certificates, domain names, or website hosting
- Configuration of website hosting
- Set up or configuration of server software
- Set up and configuration of backup systems
- Email and systems pertaining to email
- Any or all design services
- E-commerce or the ability to register for courses online
- Content entry
- Written code tests such as unit testing or behavior testing
- Training Videos
- Testing for web browsers older then 12 months from the start of project.
- Updates to contributed or base software
- Design and branding services
- Analytics or SEO reporting

Figure 1: In scope and Not in scope

6 Deliverables :

Deliverables

> Deliverables is a list, with a brief description, of everything tangible that the project will produce and have an agreed upon grade and quality that set appropriate expectations for its completion.

Tangible : mesurable

> *A deliverable is an element of output within the scope of a project. It is the result of objective-focused work completed within the project process. They can be internal or external.*
> For more details, please check What is a deliverable in project management?

7 Project assumptions :

Assumptions in project management are essentially conditions or factors considered to be true, real, or certain without proof or demonstration. They serve as foundational beliefs upon which project plans and decisions are based. These assumptions often involve aspects like resource availability, stakeholder behavior, external dependencies, and environmental factors. Identifying, documenting, and validating assumptions is crucial for managing risks and ensuring the success of a project.

If you don't identify assumptions and they happen to occur the project will suffer, and, conversely, if there are assumptions you identify, the project will usually benefit.

Assumptions could concern :

- resources
- deliverables
- environmental
- budgetary
- functionality

8 Methodology :

9 The WBS

The Work Breakdown Structure is the process that breaks down an activity into smaller chunks, and this recursively until the activities are "small enough".

The WBS is based on the task dependencies types :

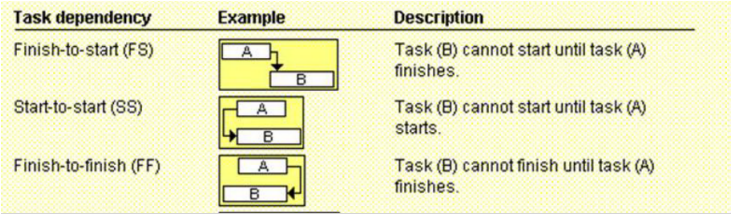


Figure 2:

Tasks can be with a lead or a lag time :

- lead : a task B that has to be begin during the task A process (negative lag time value)
- lag : a task B that can't be begin before task A is finished. B task can be begin at the exact end of the task A or after the end of task A (positive lag time value)

To prepare a WBS, we have to follow these steps :

1. identify the major sets of activities
2. break the major activities down further
3. allocate duration to the tasks
4. determine the dependencies between the activities

10 Cost management

10.1 Resource planning

Resource planning depends on several things :

- how difficult will it be to do specific tasks on the project
- organization history of similar tasks
- how scope statement can affect resourcs
- can the organization do the project

10.2 Cost estimating

They are different ways to estimate a budget :

- detail/bottom up estimation : estimate based on the detailed tasks of a complex project (+++ time consuming) (target range from -5% to +10%)
- historical estimate : estimation based on the actual budget of previous project (from -15% to +25%)

Principles for estimating

- base the estimates on the performance of average staff

- estimates has to be done and reviewed by qualified people
- reflect the most likely cost and not a padded one
- allowance needs to be made for :
  - contingencies
  - high risks (from assumptions)
  - scope changes
  - unknowns

Challenges of estimating
Cost estimations are a complex tasks that requires a significant amount of effort, and people have a bias towards underestimation that can be curves by learning how to do estimations.

Don't estimate well the cost of a project could be very harmful for the project. Bad estimation could come from :

- price escalation
- exchange rates
- requirements unclear
- scoop creep
- technical complexity
- historical data ($\neq$ from historical cost estimation : historical data it's just all the type of data that we reuse from a previous project to the current project)
- integration
- new technology
- external dependencies

10.3 Cost budgeting

Project budget consists of direct costs (staff charges, expenses), indirect costs (all the is not directly linked to the project but that is required for the project (paper towels for example)) and capital costs (equipment, servers ...).

It's possible to alter the budget by :

- staff rates
- expenses
- capital costs : negotiate the best prices and amortize the equipment

11 Risk

Mitigate the risk : respond to the risk
risk : something that could go wrong
Risk identification process

11.1 Risk identification

A good rule of thumb is to identify risks using logical categories (like technical, business, legal, natural events etc...).

Examples of risks events :

- scope creep
- server downtime
- server purchasing delays
- no cooperation from departments or users

11.2 Risk quantification

The level of a risk in a project is determined by :

- probability
- impact if occured
- category of the risk

	Impact		
Probability	**High**	**Medium**	**Low**
High	Extreme	High	Medium
Medium	High	Medium	Low
Low	Medium	Low	Minimal

Figure 3: Risks levels sum up

11.3 Risk response

One we have categorized risk, we have to create a response for each one. Usually, responses to risks involves at least one of these three aspects :

- more time
- more money
- more effort

As all the management process of the project, each risk is meant to be monitored and control by someone who will assume the responsibility of a risk.

12 Quality

12.1 Definition

Quality

> The quality is the degree of excellence of a thing that could be measured by its conformance to requirements, fitness for use and erros count kep at a minimum.

Quality requires customer satisfaction, prevention and management responsibility for quality.

Main characteristics of quality are :

1. reliability and durability
2. conformance to requirements
3. serviceability
4. aesthetics
5. timeliness
6. cost

12.2 Quality planning

When we plan for the quality, we have to determine the quality standards/rules/guidelines and communicate it to the other members of the team, because everyone is responsible for the quality of their deliverables.
Quality standards are based on technology, deliverables, documentation, training and project duration. These standards would be tied to the scope of the project.

12.3 Quality control

Quality control involves the monitoring of specific project results to ensure that they comply with the relevant quality standards.
Quality control takes place throughout the project lifecycle and not just at the end.
Quality control leads to:

- Acceptance decisions
- rework to achieve compliance
- process adjustement to prevent future problem

Quality have to be controlled and could be controlled by :

- quality audits :
  - may be done in-house or by an external and could be realised randomly or not
  - goals : assess progress on meetinf quality and goals and identify areas for improvment or change
- peer review :
  - realized only by technical project peers
  - deal with requirements analysis, system architecture design, functionnal specifications, implementation plans and test plans
  - no deliverable will be considered complete until it has been reviewed
- testing
  - it's regular testing abour planning, preparation and execution
  - it requires a lot of efforts but ensure quality

12.4 Cost of quality

Poor quality project could lead to rework, lost hours, customers ill will, lost sales and warranty costs.
The quality of a complete project could be only determine by the end users satsifaction.