Software Development Process

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LANIT-TERCOM IT Outsourcing

Development Process Document

This document describes the flow chart of a typical software development project (1-12 months). The document contains both the general picture and the detailed overview of each technological stage. See the corresponding chapters.

Symbols

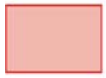
- indicates some activity

- indicates some result

- white color indicates a Customer's, Agent's and Developers' joint efforts

- green color indicates a Customer's activity

- blue color indicates Developers' activity



- red color indicates an Agent's activity

- indicates a Visual Freeze milestone

Throughout this document the following symbols will be used:

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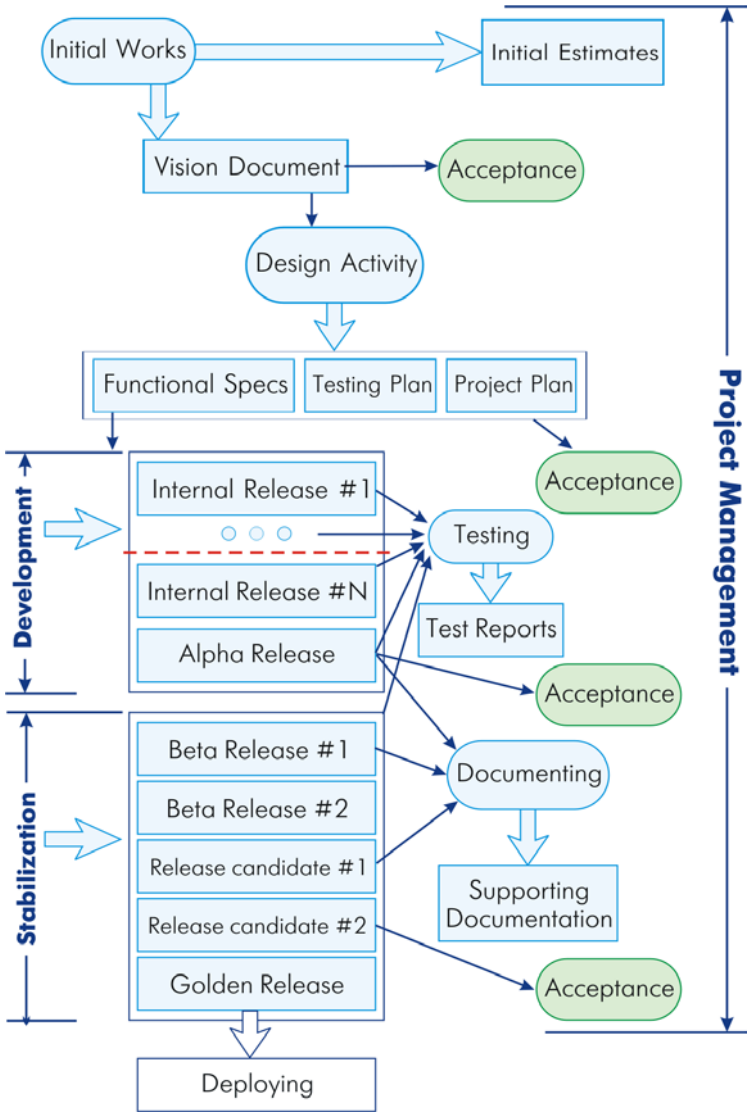
General Overview



This diagram describes the whole workflow of a long-term Maintenance project.

The project starts with the **Initial Work** that involves all parties (Customer, Agent and Developers). It consists of a number of smaller stages and milestones (see more detailed description below). The main goal of this work is to produce the **Vision document** - this document is used as the basis for the further development, and **initial estimates**.

The next phase is **Design Activity** – the work done entirely by the Developers. The goal of this work is to develop the **Project Plan, Functional Specs** and the **Testing plan**.

After Customer acceptance of these three documents, we enter the **Development** phase. During this phase Developers produce a number of internal releases that gradually extend the functionality of a product. The stage ends with the production of Alpha Release that is reviewed and approved by the Customer.

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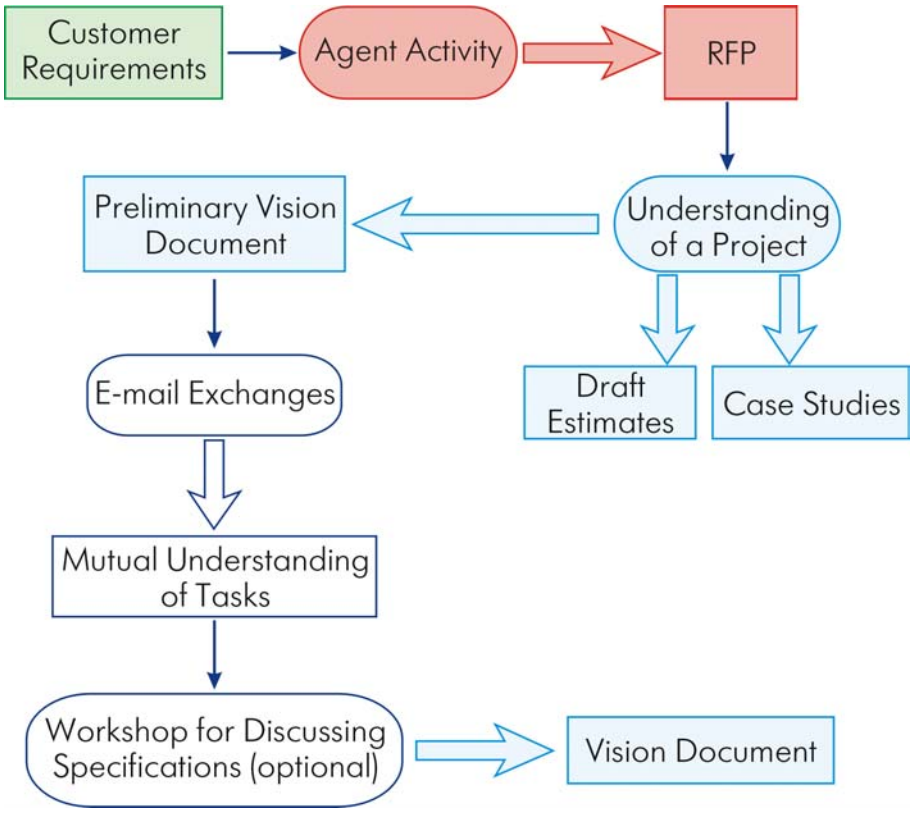
In the middle of the development stage we have a **Visual Freeze Milestone** after which Developers do not change the specifications unless documented in the **Change Journal**. This is also a signal to start integration and performance testing and documenting processes.

The next step is **Stabilization** stage. During this stage developers produce Beta versions of the product, provide Beta support, gather feedback and do final testing.

The final delivery is the Golden Release of the product, a set of supporting documents that includes test reports and a set of tests (possibly with testing utilities).

The last step is **Deploying**. During this phase, the team deploys the core technology and site components, stabilizes the deployment, transitions the project to operations and support, and obtains final customer approval of the project. After the deployment, the team conducts a project review and a customer satisfaction survey.

Stabilizing activities may continue during this period as the project components are transferred from a test environment to a production environment.



Initial Work

The **Initial Work** starts from Customer Requirements that may be verbal or written without detailed specifications of how the project should be implemented. The Agent or Customer produces some kind of **draft specifications** (RFP) and sends them to the Developer. We study the documents, understand the task and respond with the following information: case studies of related works, **draft estimates** of duration and cost and a Preliminary Vision document. Ideally this should be produced with a very short turn around cycle.

Then the Developer and the Customer have a period of **e-mail exchange** to come to a **mutual understanding** of the task.

If a Customer has any difficulties formulating initial requirements for the product, a **workshop** is considered where the Developer helps the Customer define his requirements.

The goal of this stage is to produce two documents – **Draft Estimates** and a **Vision Document**.

Case study document

Case study document is a paper that describes some previously performed project. This is a kind of reference and its goal is to assure customer of our competence in the technologies that will be used to implement his project.

The Case Study document should contain the following information:

- **Problem description**
- **Solution description**
  - technology used
  - development schedule
  - duration
  - location of work
  - team size
  - description
- **Client information.**

See Case Study document template for more details.

Preliminary Vision Document

The Preliminary Vision Document contains the essential information such as draft schedule, cost, team description, and risk management information. The goal of this document is to show the customer that we understand the project and have a clear vision of how we are going to perform it.

The Preliminary Vision Document should contain the following information:

- **Process Description**
- **Vision**
- **Team Description**
- **Risk Management Plan**
- **Draft Project Schedule**
- **Payment Plan**

See Preliminary Vision Document template for more details.

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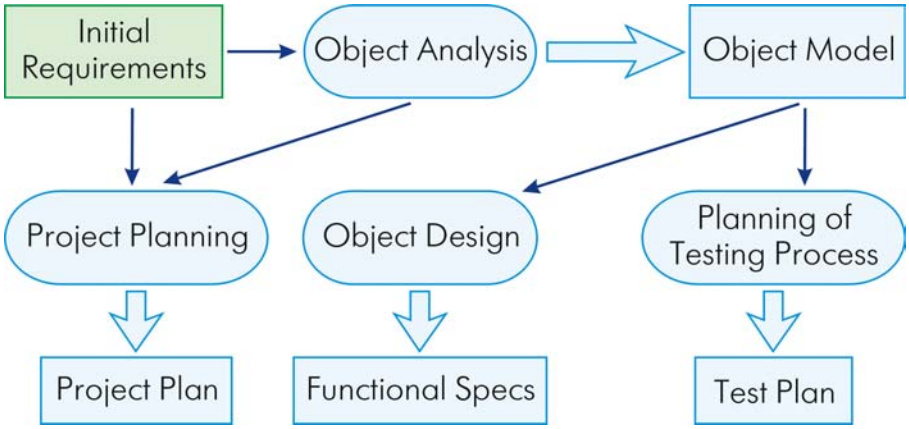
Design

The next step of our process is **Design Activity**. This is a planning activity and usually takes up



to 30% of the process duration. This stage can be performed with the Customer's active participation, especially in High Level Design.

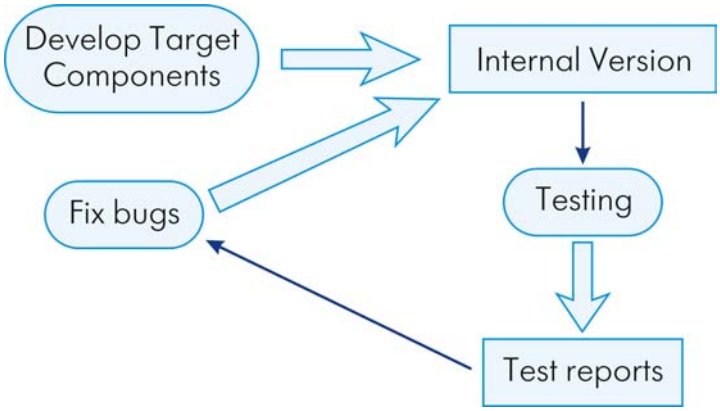
For design purposes our CASE tool called REAL is used (or Rational Rose can be used at the customer's request). The goal is to produce detailed specifications describing the whole functionality of the product in terms of objects and functions.

Simultaneously we create the detailed **Project Plan** and **Test Plan**.

The **Project Plan** needs to be adjusted after the **Visual Freeze** milestone, when we freeze the functional specifications.

Implementation

During the Implementation stage we produce a number of internal versions of software that are a subject to internal reviews. These releases are feature-based, i.e. the goal of each internal release is to implement and test some features. The picture below shows the activities scheme used for each internal release.



The last internal release is considered as Alpha release that requires Customer's acceptance.

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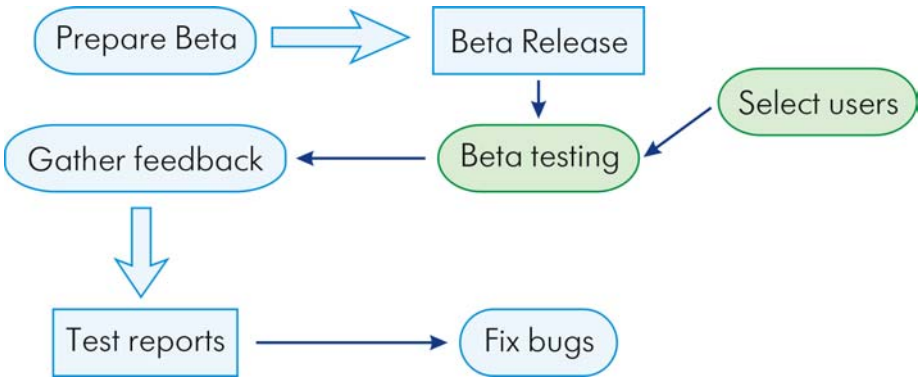
Stabilization

Stabilization stage is necessary to finalize the product. In consists from a number of Beta releases. For each Beta developers fix bugs found during Beta test.



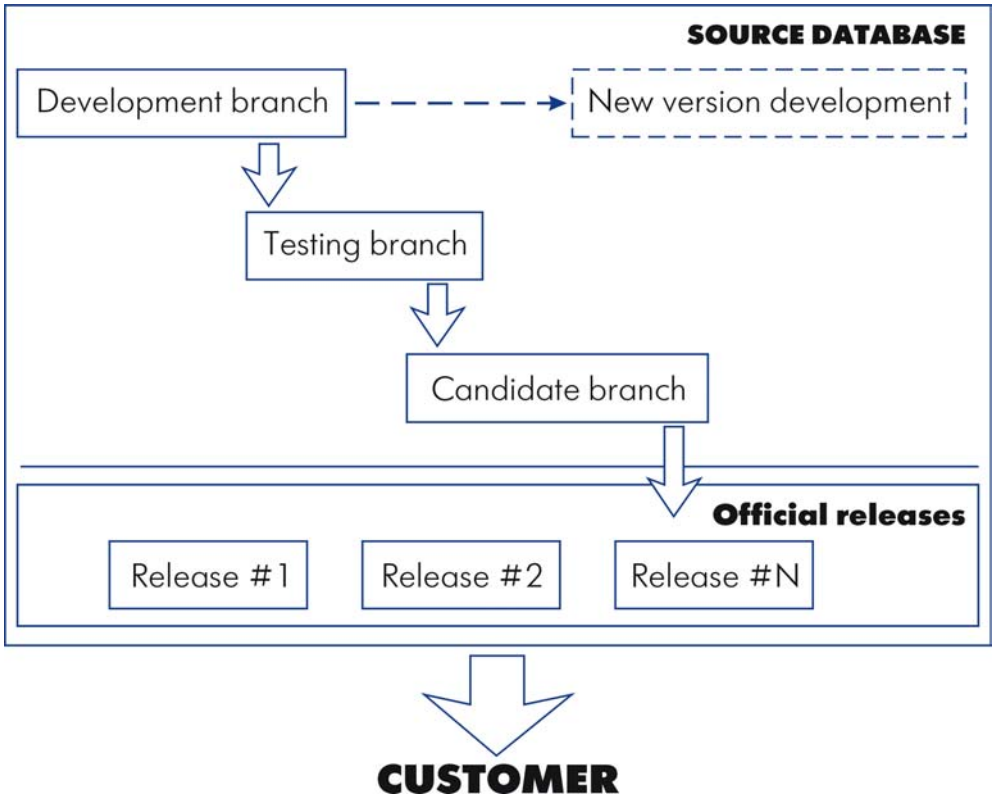
Final Beta is considered as Release candidate that is a subject to Customer's review.

Accepted Release candidate becomes Golden Release.

Versioning

To keep track of versions we use standard versioning software: MS Visual Source Safe for Win32 projects and CVS for UNIX projects.

The picture illustrates the structure of source database for the typical project:



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We simultaneously support a number of product versions.

These are all previously released versions and three versions that are under development.

Development branch is a version where developers implements new features, experiments, etc.

Testing branch is a version for testing. The decision to move feature from development branch to testing branch can be made by team leader.

Candidate branch is tested and stable version of a product. Testing version becomes candidate after thorough testing by decision of Project manager.

At the Release stage candidate version becomes release one and we continue working on new version of a product.

Change Journal

If during the development process we receive a request from the customer for changes in the functional specifications (for example to include some additional functionality), we make a note of these changes in a Change Journal. Based on this document we adjust the project schedule and/or cost.

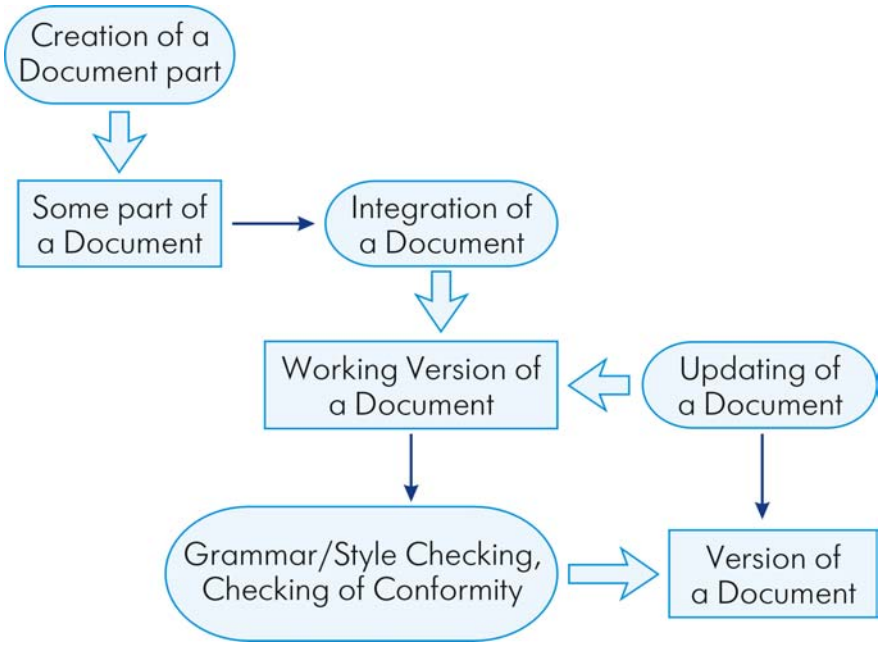
Documentation

After the **Visual Freeze Milestone,** we begin to write the supporting documentation. This includes the following documents:

- System Overview – a general document that describes the purpose of a project and its functionality;
- User's Guide – a document that describes in details all functions of a project from the user's point of view;
- Programmer's Guide – if the project is essentially some kind of library, then a document describing how to work with it, i.e. all interfaces, is produced;
- Implementator's Guide – a document that describes a project's internals so the Customer can to make modifications if desired;
- Administrator's Guide – if a project needs administration, it is supplied with this guide;
- Installation Guide – describes software installation;
- Emergency Guide – describes what to do when problems occur;
- Testing Plan – the document that describes the testing process;
- Test Reports;
- Release Notes.

All documents are given in a pre-agreed editable format.

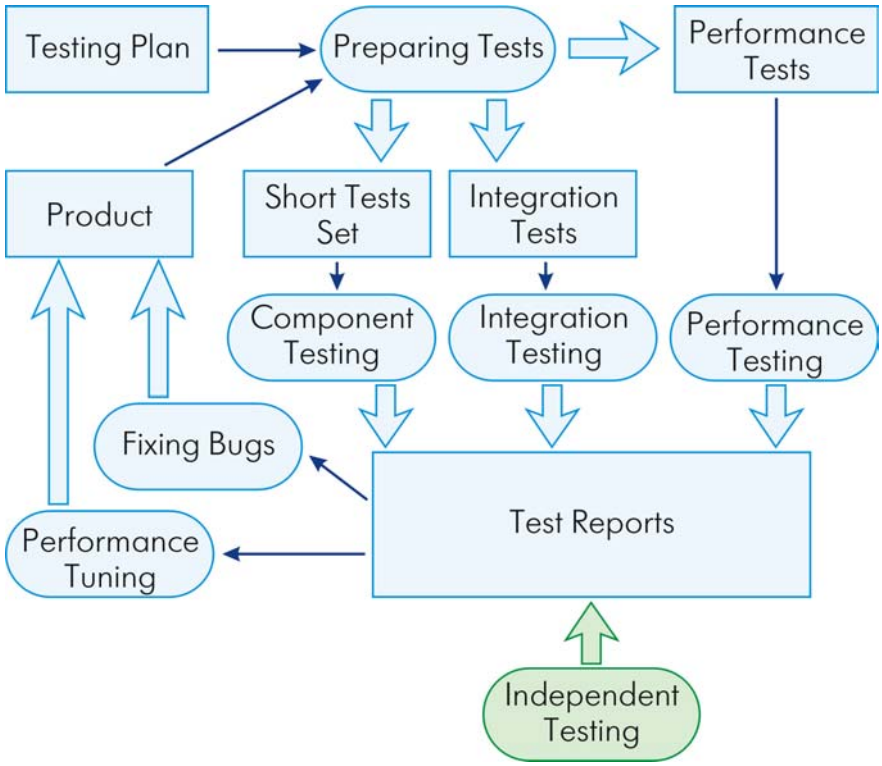
Each document is created according to the following scheme:



Versioning

For documents we use the same versioning tools as for sources: MS Visual Source Safe for Win32 projects and CVS for UNIX projects.

Testing Process



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The testing process is an essential part of the development. The testing is divided into four stages. The first stage is the preparation of test sets according to the testing plan and the functionality of a current version of a project.

There are three general test sets:

- ShortRuns (positive and negative) – short tests for specific functionality;
- Integration tests – large tests emulating the real work;
- Performance tests – for testing a real-life workload.

Reports for each test are produced and given to the Customer along with other documents. The tests themselves are also passed to the Customer to allow for reproduction of test results in the future.

Test sets must be pre-agreed and fixed. Information on any additional test to be included in process is reflected in the Change Journal and is an input to possible project plan adjustment.

Project Management

Typically there is a project manager on our side and a manager on the Customer's side. All communications between the Customer and Developers are done by email via project managers in PGP encoded form. The project manager on each side reads a message and redirects it to the corresponding person. The responsibility of our project manager also includes the detailed project plan preparation, conducting the workshops and the maintenance of a progress-tracking system. The progress-tracking system includes:

1. Weekly reports
2. On-line test reports
3. On-line build reports

References

1. MSF Process Model Document
2. MSF Team Model Document
3. Case Study Document Template
4. Preliminary Vision Document Template
5. Project Schedule Template

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