

# Software Estimation using Function Point Analysis: Difficulties and Research Challenges

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## ABSTRACT

Function Point Analysis method serves better efficient way of predicting estimation in beginning phase of software development life cycle(SDLC). Size and complexity of the software can be derived by function point analysis method. Difficulties of estimation using LOC(Lines of Code) can be avoided using Function Point Analysis, since it deals directly with functions or requirements and independent of language or technology. This paper explains how to calculate Function point analysis for the case study Defect Tracking System(DTS) by using function point analysis. Defect tracking system(DTS) case study has been taken from “XYZ” company. In the intention of maintaining confidentiality, authors are not disclosing the company name. Authors also discusses difficulties and challenges by using Function Point Analysis as part of their Research Work.

## 1. Introduction

Function Point Analysis was developed by Allan J. Albrecht in the mod 1970s. Function points are independent of language, technology, tools and database. Reestimate can be easily achieved by function point since function points are directly linked with change of requirements. Function point analysis can be done at the beginning stage of software development life cycle(SDLC), so that development estimation effort can be predicted at each stage of requirement phase or design phase.

## 2. Case Study – Defect Tracking System

The Defect Tracking System will be a web application that serves as an aid to managing the testing cycles in software projects. It presents a simple yet effective interface to log defects and provides for workflow management of the defect life cycle right through the typical processes of assigning, fixing and closing a defect.

The DTS will be low cost, and use simple and easily accessible technology, without demanding a high learning curve on the part of the users. The solution shall be low cost, and implemented in quick time. The preferred platform is Microsoft ASP and MS Access. Reporting can be done through MS Excel pivot tables, and thus all the Defect

Tracking System should require as installation pre-requisites is a Windows 2000 machine with MS Office installed. A normal desktop running the DTS should serve multiple projects simultaneously.

## 2.1 Functional Requirements

### 2.1.1 Testing Defects

**2.1.1.1 Enter New Defect :** This is the main defect entry screen, the fields that need to be captured are shown in the figure below.

The screenshot shows a web form for entering a new defect. It includes the following fields: Defect Title (text input), Description (large text area), Test Case (text input), Test Step (text input), Test Cycle (dropdown menu), Module Name (dropdown menu), Severity (dropdown menu), Priority (dropdown menu), Detected By (text input), Assign to (text input), Phase Introduced (dropdown menu), Phase Detected (dropdown menu), Root Cause Code (dropdown menu), and a Submit button.

Fig1. Testing Defect Entry screen

**2.1.1.2 View Defect ID :** In this screen the user enters the Defect ID known to him. On submitting this, if this is a valid defect, the details of the defect are displayed.

**2.1.1.3. Query :** This screen presents a range of query options. The user can filter the entire list of records for various criteria.

The screenshot shows a web form for querying defects. It includes the following fields: Defect Type (radio buttons for Testing, Review, All), Pending Only (checkbox), Show Description (checkbox), Defect Title (text input), Module (dropdown menu), Test Case (text input), Status (dropdown menu), Phase Detected (dropdown menu), Severity (dropdown menu), Test Cycle (dropdown menu), Detected by (text input), Start Date (text input), End Date (text input), Assigned to (text input), and a Submit button.

Fig 2. Query screen

### 2.1.2 Review Records :

Review Record entry : This Captures the Review Record report.

**2.1.2.1 Enter Review Record Header :** The fields that should be captured are given below

Project Code :	<input type="text"/>
Module Name :	<input type="text"/>
Item Under Review :	<input type="text"/>
Item Type :	<input type="text"/>
Version No :	<input type="text"/>
Review Iteration :	<input type="text"/>
Review Criteria :	<input type="text"/>
Author / Developer :	<input type="text"/>
Release Date :	<input type="text"/>
Review Date :	<input type="text"/>
Reviewer :	<input type="text"/>
Phase Detected :	<input type="text"/>
<input type="button" value="Start Review"/>	

**Fig 3. Enter Review record Header Screen**

**2.1.2.2 Enter Review Defects:** The user adds review defects one by one. The fields to be captured are:

Defect Location :	<input type="text"/>
Description :	<input type="text"/>
Severity :	<input type="text"/>
Phase Introduced :	<input type="text"/>
Root Cause Code :	<input type="text"/>
<input type="button" value="Add Defect"/>	
<input type="button" value="Cancel"/>	<input type="button" value="Finish Review"/>

**Fig 4. Enter Review Defects Screen**

**2.1.2.3 Review Record Report :** As each record is submitted, the screen should be refreshed so that the review record report is built as shown below. The defects will be automatically assigned to the author. The phase differences and totals of the defect severity are totaled and summarized automatically.

Project Code :	Module Name :
Item Under Review :	Item Type :
Item Version :	Review Iteration :
Review Criteria :	Author / Developer :
Release Date :	Phase Detected :
Review Date :	Reviewer :
Pages or Lines :	No of Pages / Lines inspected :
Decision :	Review Effort :

  

ID	Defect Location	Description	Severity				Phase Intro.	Phase Diff.	Root Cause Code	Status
			F	M	N	S				
1				M			3	0		Assigned
2				M			3	0		Assigned
			0	2	0	0		0		

**Fig 5. Review Record**

**2.1.2.4 Review Status :** When the user ends the review session, he has to enter the following details:

No of	<input checked="" type="radio"/> Pages	inspected :	<input type="text"/>
	<input type="radio"/> Lines		
Review Effort (minutes) :	<input type="text"/>		
Decision :	<input checked="" type="radio"/> Accept product as is <input type="radio"/> Revise (no further review) <input type="radio"/> Revise and schedule another review		
<input type="button" value="Cancel"/>			<input type="button" value="Submit"/>

**Fig 6. Review status entry screen**

**2.1.2.5. Review Record View :** User enters the ID of a valid review record and it will be displayed

**2.1.2.6 Review Record Query :** User is given query criteria to select similar to defect query. The query fields are given below.

Review Item :	<input type="text"/>
Version No :	<input type="text"/>
Author / Developer :	<input type="text"/>
Reviewer :	<input type="text"/>
Module :	<input type="text"/>
Phase Detected :	<input type="text"/>
Start Date :	<input type="text"/>
End Date :	<input type="text"/>
<input type="button" value="Submit"/>	

**Fig 7. Review Record Query Screen**

1. On a successful log in the user will see the test defects entry screen by default.
2. The user should have a navigation menu so that he can access the different screens easily.
3. The user should be able to submit an attachment for a defect, e.g. screen shots, or a detailed write-up.
4. To reduce data entry load of the user, commonly used default values should be populated in the entry fields wherever possible, e.g. today's date.
5. Date entry should be made easy with a calendar popup function.
6. Defects will be of status "New" as soon as entered. The different status changes depending on the defect status like assigned, on hold, dropped, etc.,
7. Defect history should be maintained and tracked.
8. Flexible reports generation using MS Excel
9. There will be an administrator role for DTS. This user can edit defect details after they are committed to the system. He can also edit review records.