

A study on the model improvement definition of software development

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Abstract: Software Development sizing method is an internationally function score (Function Point) which has been adopted as a standard. However, many development companies are still utilizing M / M (Man-Month) development cost sizing method. The showing of different results depends on who estimates the job, even if the company which estimates the development scales using function point. Because most of the user's expression creating the requirement is not using incorrect presentation and not presenting any clear range. In this study, the 'scale development' on a very important 'users' requirements and create a clear 'function point' for increasing the accuracy of sizing 'functional requirements definition model is proposed

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1. Introduction

Various software development scale assessment methods exist such as LOC, COCOMO, Man/Month, FP and others. Recently, the internationally acclaimed FP (Function Point) is being used in the effort of assessing development scales. Together with this, demand requirements are being detailed and in parallel with the defining of development scales.

However, any new user of this software lacks the proper knowledge and skills for its application, the proper understanding of its functions, as opposed to the developer and if any help from the developer is not sought, the meeting of requirements would be very difficult.

For this reason, it can be seen that drawing FP from requirements varies from every professional in every company.

In cases of industries built on Information management system, many parts of the software development are composed of data management. This scale sizing, based on data function and transaction function, can be called FP method compatible software.

On the other hand, information strategy procedure (ISP) for informationalization of business that is similar to information management system scale or like a consulting part FP similar to business process design (BPR), It is very difficult to calculate individual price.

Even excluding this consulting part, any research to elevate the definiteness of software development user defined requirements is very insufficient.

It follows that this research, through a systematic method generated from user requirement,

the definition of a direction to a simplified sizing for the simplification of improved function requirement is suggested

2. Related works

2.1. Risk of software development project

When based on the definition of risk, the risk of information systems projects are the uncertainty associated with success / failure of project and the potential loss is due to failure of the project that can be defined in two dimensions, in the end that will be understood a key element what should be controlled in information systems projects is the risk factors of right project [1].

2.2. Unclear Requirements

Unclear requirements make to out of scope of cost management and control the project, finally, the main factors to lead to project failure. However, the requirements is virtually impossible for completely define in the early stages of a software project. The user is often present only a comprehensive functional requirement without detail functions [4, 5]. Changing requirements on project when based on unclear requirements is inevitable reality [2, 3].

2.3. Development scale calculation method

Korea developing companies most used method can be mentioned M / M (Man-Month) method. This method is a way to predict to new businesses size based on similar project workforce commitment. Development company are blow up the number of workforce for increase the profit margin and estimating development costs based on the wage unit price of manpower. There is calculating based on

program copy of quantity and estimate based on the number of lines of source code method. It can be seen large difference according to programming language or technical method, so case of new programs is difficult to predict the number of result [4, 5].

Function Point published by Allan J. Albrecht of IBM in 1979, the "Function Point Analysis (FPA)." It is Developed by the user's request, and to provide users with a way of quantifying the function of software. And the advantage what can be measured that the workload of software development and maintenance by irrespective implementation technology and inter-comparisons are easy because can be consistently measured across whole Projects and organization.

There is an existence of International Function Point User Group (FPUG) that is related to over all FP and for sizing calculation regularization enhancement, FP Method sizing manual is produced and introduced.

Function points are a measure of the type of development project function point measurement and improvement projects, There are Function Point that measure the type of development project function point measurement and function point measurement applications [2].

A development project function point measurement of the software project in India is done so wherein the end user with the initial installation to measure the braking function and, improving project function point measurement refers to the measurement of the existing part of the application to be changed so that the project is completed for the user to add, modify, delete, etc. Function Point measurement application is installed, the baseline function score or measure or the application provided to you is a measure of the current function. If this measurement is completed, the development project function point must be initialized.

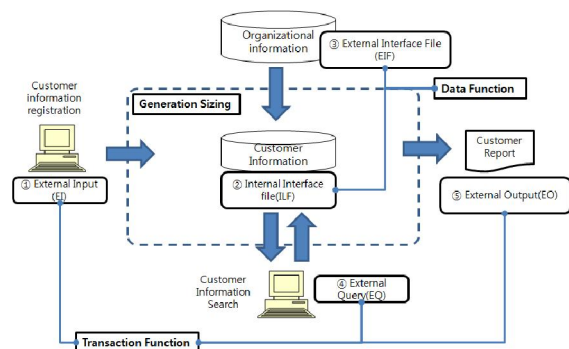


Figure 1. Five Function Types

Function Point sizing aims at five types of function (Function Type) and does not only depend

on development methodology, development language, and adopted materials or skills called "procedure."

Thereby, a cost can be achieved that corresponds to development scale. Figure 1 shows, based on real example, how the five function types are generated.

The Function Point is made Point Generalization after user requirement sizing, sizing of the generation of data function and transaction function.

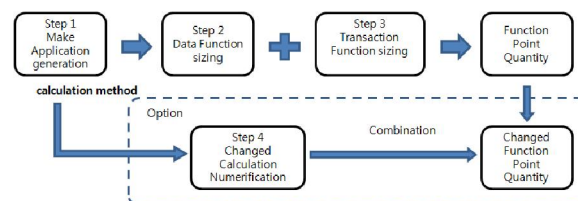


Figure 2. Function Point Sizing Sequence

Figure 2 shows Function Point sizing. From the regulators written criteria, fourteen are information communication, dispersed information communication, efficiency, user frequency composition, transaction speed, online information input, last user efficiency, complexity solution, recycling, installation readiness, usage readiness, multiplicity, change acceleration.

(1) Data Function Application Type

In Data Function, there are 2 kinds, namely Internal Logic File (ILF) and External Interface File (EIF). There is a need to understand and clearly differentiate each of their differences. ILF functions include sizing of application, maintains and keeps data, updated (new, additional, changes, deletion) data while, EIF function includes sizing of application that are not included for reference.

(2) Transaction Function Application Type

Transaction Function type has three kinds, namely External Input (EI), External Output (EO), External Query (EQ). EI function includes monitor or other applications that includes input of data in updates (new, additional, changes, deletion) processing and arrangement.

EO function includes monitor or spread sheets, processing of other application that outputs data, limited to the inclusion of output data sizing or derivation data (finite numbers, average, graph or processed data). EQ does not credit ILF nor process output of monitor spreadsheets, other application or output application process. And it does not include output data sizing or derivation data.

(3) Transaction Complexity Understanding

In the processing of transaction function output the processing sequence surfaces. Basing on this, each complexity is determined upon counting every transaction function Data Element Type (DET) and File Type Reference (FTR).

Table 1. Transaction Complexity Analysis Table

EI Type		Data Element Type(DET)		
		1~4	5~15	16~
File Type Reference (FTR)	0~1	low	low	mid
File Type Reference (FTR)	2	low	mid	high
File Type Reference (FTR)	3~	mid	high	high
EO/EQ Type		Data Element Type(DET)		
		1~4	5~15	16~
File Type Reference (FTR)	0~1	low	low	mid
File Type Reference (FTR)	2	low	mid	high
File Type Reference (FTR)	3~	mid	high	high
ILF / EIF Type		Data Element Type(DET)		
		1~19	20~50	51~
Record Element Type (RET)	1	low	low	mid
Record Element Type (RET)	2~5	low	mid	high
Record Element Type (RET)	6~	mid	high	high

3. Definition of user requirements

3.1. Objective

The FP about user requirement sizing expense is being calculated with the Function professional. It is not guaranteed that all professionals are unified in which FP will be used for sizing. Even though the indefiniteness of user requirement is the origin, it is because there is a need for wide experiences on the development of FP sizing itself. Though defined Sizing procedure of Function Point, this can be used to achieve same results this kind of situation.

3.2. Function point generation

A user requirement similar to Table 2 was developed from a web environment supposition and process was observed through a professional's Function Point generation. The data function and transaction function play a very important role on the sizing of function point, and only aims for the transaction complexity, numerification of processes.

Table 2. Change in Customer Information User Function Requirement

Function: Change of Customer Information	
1	Existing customer information is shown on first window
2	Address need to be searched through input of ZIPCODE
3	Shows confirmation message after saving data.
4	For password security section, separate management table must be added.
5	In cases of changes made, "SAVE CHANGES" button must be clicked to assure changes are made before saving.
6	Show latest login time.

(1) Customer informational change page composition

Customer information change is normally linked though clicking a "Change Customer Information" button on the webpage of a logged in user. The change customer information page is composed of the

Customer ID, ZIPCODE, address, telephone number, fax number, email address and "search address" button for saving address. In here, a button "SAVE CHANGES" for input information and "CANCEL" button to cancel any changes made.

(2) Data Function Numerification

Looking at customer information change data function generation, one Internal Logic File (ILF), "Customer Information" and one External Interface File (EIF) "ZIPCODE" can be known existing.

In some cases, it can also be composed of one ILF "Password" saving for customer log in. In here, one Data Function ILF and one EIF are present.

(3) Transaction Function Numerification

In the customer information change page, a transaction page composition is used for reference, and if generating EI, EO, EQ, one EQ "Customer Information Change" and one EQ "Search Address" are present. And for saving customer information changes, one EI "Save Changes" is present.

(4) Transaction Complexity Numerification

In Customer Information Page, in/output generation DET has seven (7) sections: One button for process, and one button for successful change or failed messages output. Therefore, there are in total of nine (9) DET. In addition, two (2) related FTR are present for password confirmation for Customer information data change. In cases that the customer is a private customer or corporate account, there are two (2) different categories of Record Element Type (RET) for its occurrence.

Table 3. Function Point Generation Table

Functions	Complexity			Total
	low	mid	high	Total
External Input (EI)	X3	X4	X6	3
External Output (EO)	X4	X5	X7	-
External Query (EQ)	X3	X4	X6	6
Internal Logic File (ILF)	X7	X10	X15	7
External Interface File (EIF)	X5	X7	X10	5
Total				21

3.3. Function Point Generation Process*(1) Function point generation automation criteria*

Upon looking at the Customer Information Change professional Function Point generation section, in order to automate, data section window must be composed of "Customer Information Change," "ID," "Name," "Address," and "Save changes," "Print Message."

It is also seen that detailed information are necessary such as "Password," "Section Management Option," "ZIPCODE Table," that are for enhancing security such as "Table," "Record Complete," must be saved.

In this research, such necessary criteria contents from user requirements are noted with the user acknowledgment for automation of the Function Point sizing.

(2) User function requirement schematization

In order to calculate the Function Point, we can total the drawn items from Figure 3 item by item, and chart the results as Table 4 and 5.

Table 4. Data Function Numerification

Data Group	Data Function	FTR	RET
Customer information	ILF	2	2
ZipCode	EIF	1	2
Log	EIF	1	1

Table 5. Transaction Function Numerification

Transaction Group	Transaction Function	Data List
Customer Information Inquiry	EQ	10
ZIPCODE Search	EQ	1
Latest Log in Time	EQ	1
Save Changes	EI	1

Function requirement that includes Function List Definition such as Table 2 in this note, it can be seen that development scale sizing accuracy is elevated. Table 6 summarizes the Data Function and Transaction Function which can be Function Point Sizing Index.

Table 6. Function Point List Definition

1. Function Detailed Category			
No	Detail Function	Purpose	Item
1	Customer Information Inquiry	Inquire	10
2	ZIPCODE Search	Inquire	1
3	Latest Log in Time	Inquire	1
4	Save Changes	Save	
2. Related Table			
No	Table Definition	Reference Function No.	Related Function No.
1	Customer Information	1	
2	ZipCode	2	
3	Log	3	
4	Password		4
3. Table Record			
No.	Table No.	Record Name	Category
1	1	Individual Customer	Security No.
2	1	Corporate Custom	Biz No.
3	2	Address	House No.
4	2	Road Name	House No.
4. Generation Field			
Table No.	Field	Table No.	Field
1	ID	1	Tel.No.
1	Customer Name	1	Fax No.
1	ZIPCODE	1	Email Address
2	Address	1	Address Category
1	Detailed Address	3	Latest Log In time
1	Customer category	4	Process Result Message

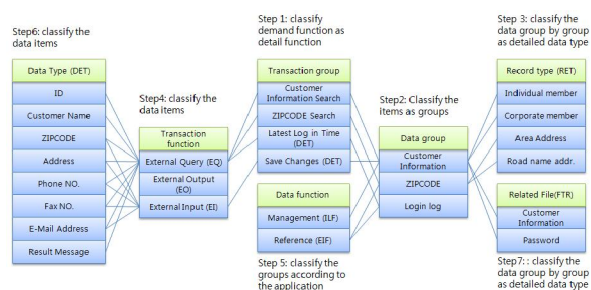


Figure 3. Function point entry procedures

And Table 1 show data function-numerification. Our proposed scheme is follows by below table. It is very simply and easy method.

4. Conclusion

The core of user definition function can be attained. Owing to every influence generated and attained from various and every development stage, while in the totality of the development estimated cost, more than forty (40%) percent has been lost to misguided requirement definition. Therefore, from the software development early basic sizing stage, the success can only be guaranteed by having only detailed and definite requirement definition.

This research which aims to present a model of requirement function definition for detailed function requirement framing up presents a definite function point listing numerification of data function and transaction function and simplifies function point sizing while contributes to the definiteness and utility development through the forecast of sizing and expense, development length etc.

However, a hindrance to it is the need of a professional for the sizing of the number of regulation.

Recently, even before large sizing information system sizing business, Information Strategy Plan (ISP) and Business Process Regulation (BPR), etc. there were many cases of definite function requirement definition through consulting companies.

For this instance, through this research, before the use of a schematized Function Point Framing up Definition, Function Point to a professional level can be achieved.

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