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IMPLEMENTATION AND DESIGN THREE SOFTWARE USING REUSABLE SOFTWARE CONCEPT "ANALYTICAL STUDY"

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ABSTRACT

There are two ways for the principle of re-use software and the first way is the indirect method indirect boils down to the use of one or more pieces of software in the production and creation of new programs without resorting to writing full code, while direct reuse a cut and paste the source code or part of a fully set up or the production of new programs, re-use indirect way in the development more than others.

In this paper, we will prove that by using these two methods or approaches we will develop software products and greater efficiency of the higher speeds and less time and in addition to that we will give a new definition to the principles of reuse and create a third way.

By using this new definition of how to re-use it can will be countries that have weak programming does not have programming experience and wide can be up to experience and master the advanced countries in this field which changes between the second and again.

INTRODUCTION

It is supposed to re-use software to save time and cost, and improve the quality of programs. By reusing product successfully developed and software developers are able to maintain the quality of the products in the new product, and managed to keep this new product through the application of experience gained previously.

Reuse you have many advantages seem to program, but there are not a lot of organizations reporting on their success stories of using the re-use process during development. Perhaps this is because there is no formal process of re-determined in the organization. Rombach Basili [2] describe exactly software development with the re-use of components. "Assume development oriented software reuse, that given the specific requirements Q projects' of an object X, and we consider reusing XK an object that is already rather than creating a tenth from the beginning. It includes re-select a group of candidates re-X1, ..., XN base experience and evaluate its ability to meet the Q ', XK and choose the most suitable candidate, and if necessary, modify the selected candidate to the XK Q "when. Become a large and complex project, it is more difficult to find what only since 2001 that "the development with the re-use" has become a standard for the new systems work. The development based on re-use, this step comes to in response to the demands of lower software production and maintenance costs, and speed of accomplish systems, and high quality.

RESEARCH METHODS

There methods have been used in our research, quantitative and qualitative and Applied .These including case studies, surveys, interviews and correspondence with software engineers and researchers and implement software using reuse concept.

Survey findings were compared to researchers experiences. The case studies were compared to other projects' experiences as discussed in the interviews as well as a sample application software once using the concept of re-use and once without the use of the concept of re-use and draw conclusions and compared with the US survey and survey Australia

Survey
Software or software products from other reusable software is a reality that already exists, the analysis of these software products in order to understand how to how you can reuse which is present in reality.
In this research we offer new mechanism or methodology in the definition of the principle of re-use of the software, which will provide some of the basic steps for the success of re-use.

To study the principle of re-use, roads and methodologies used in it, it has been selected three software or a software project, the first project: will be designed and implemented without the use of a methodology (re-use) and extracted the results from this project or software product for the purpose of comparison.

The second project: We will use the principle of re-use, but the traditional way or used effectively and draw conclusions for the purpose of comparison, too.

The third project: we will apply the proposed methodology in the re-definition of the principle of re-use in terms of design, implementation, distribution and draw conclusions for the purpose of comparison with the previous Projects directly and an analysis of how well the proposed method in terms of time, performance and cost.

Project Details
SMS (salary management system)
The first program, which was carried out without the use of the concept of re-use is a program that calculates the salary, management the salary for computer science faculty.

Product Name	SMS (salary management system)
Product Version	1.FA
Purpose	To manage salary of employee of computer science faculty.
Size	Large (20 modules)
Representation	Library and Batch
Language	VB
Programming Style	Procedural
Product Dependency	None
Portability	Supported platforms: Windows, Solaris7, HP11, AIX433, Linux 2.6
Application Domain	Data processing
Solution Domain	Spiral life cycle model
Concurrency	Thread safe
Years used	2016-current
Target Users	account manager

Table 1 (SMS (salary management system))

BBS (borrow books system)
The second program, which was carried out with the use of the concept of re-use is a program that mange the brow books from library of computer science faculty

Product Name	BBS (brow books system)
Product Version	2.FA
Purpose	To manage the brow books from library of computer science faculty.
Size	Large (30 modules)
Representation	Library and Batch
Language	VB
Programming Style	Procedural
Product Dependency	None
Portability	Supported platforms: Windows, Solaris7, HP11, AIX433, Linux 2.6
Application Domain	Data processing
Solution Domain	Spiral life cycle model
Concurrency	Thread safe
Years used	2016-current
Target Users	Librarian

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Table 2 (BBS (brow books system)

BBS (DMS) Debt Management System.
The third program, which was carried out with the use of the concept of re-use is a program that mange the Debt for supermarket.

Product Name	(DMS) Debt Management System
Product Version	2.FA
Purpose	mange the Debt for supermarket.
Size	Large (30 modules)
Representation	Library and Batch
Language	VB
Programming Style	Procedural
Product Dependency	None
Portability	Supported platforms: Windows, Solaris7, HP11, AIX433, Linux 2.6
Application Domain	Data processing
Solution Domain	Spiral life cycle model
Concurrency	Thread safe
Years used	2016-current
Target Users	Librarian

Table 3 ((DMS) Debt Management System)

Requirements Document Analysis
Format Functional Requirements
Established card containing the requirements of the project on the basis of functional requirements, show designed templates did not follow any standards, especially in the first project, and so are the requirements analysis then extract the card containing the functional requirements of each software project by making adjustments with the team software developer and then put functional requirements in the following format, for further analysis.

- FR Index
- FR Title
- FR Descript
- Integrated requirements

When requirements analysis observed the following:
- There are multiple requirements, and the guests in every Mottag
- The original requirements were modified in the most entitled Almottag
- The new product contains new requirements modified from previous requirements
- The original requirements should be devastating in the new version
- Deleted requirements are modified requirements previously

Functional requirements, analysis tables
The table contains the requirements of the project reminds me each table follows
1. No. 1 project
2. The purpose of the project
3. Number of requirements
4. job title
5. Express Source Requirements

Functional Requirement Matching
So are privy to compare between producers or more in order to get a similar requirement. The first product requirements are compared with the second product requirements and this comparison is described as follows:
RW: Collect the functional requirements of the old product with all the requirements of the previous product
RN: functions collection requirements of the new product after all the requirements above

Extracting keywords and Evaluation
In order to find a match between the requirements will separate the words from the requirements and evaluation during the matching process should use keywords only for reference and can not be relied upon, words vary from project to project.

Determine the outcome of re-use
As a result of re-use is an indicator showing the extent of matching functional requirements between the two projects and the possibility of re-use and is expressed in this correspondence through a percentage using these results define the code that can be reused and express clearly and we will use the following semble :

Fnew - F requirement in the new product
Fexist – F requirement in the current product
the functional requirement description as:
F - {Title, Description}
where both Title and Description as set of keywords.
Title - {Key1, Key2, ..., Keyx}
Description - {Ke1, Key2, ..., Keym}
where x and m are the number of keywords in Title and Description .

Design Analysis
Design analysis is similar to the analysis of the functional requirements and depends on the requirements card directly and are design requirements analysis process in accordance with the following

Requirements
Analysis of the functional requirements and their representation in the form of Negotiable take actions design, put methods determine the requirements and how to represent it in the design, such as this: if you assume that we have a function requirement F is represent to design becomes a symbol FD. So we will identify any designs are not reused

Source Code Analysis
When there is source code should be analyzed this code, through the definition of class and the constituent units of the code source the definition of each of those items or units with a description of all linked

Comment Analysis
The commentary on each function analyze and compare, if there is a match and this analysis enters normalize the process of selecting the the appropriate function for re-use

Function Analysis
All analysis (class/module) substantially the same requirements and the poisoning of the new project is the comparison with (class/module) in previous projects or current to determine which jobs can be reused and documenting post via shown table in which all the details by which operates compatibility between the two functions for the purpose of re-use
Each table contains the following:
• F New Project Name is the name that define the new project.
• F Current Project Name is name that define the current project.
• File is the file name of the function in the current project .
• Expected Reuse is rate refers how two functions are same..
• Function Descript is descript of function
 • Module or Class
    1.   Match the functional requirements:
The first way:
The select (Expected Reuse)
For the purpose of finding (Expected Reuse) Function requirement is divided into three sections
     • function name:
     • Type of return for the function:
     • Parameter:
These components are determined by the concordance, according to the specified percentage of the guide follows
Type of return for the function: 20%:
If the yield of the two functions is identical to give 20%
If the yield of the various functions and one type give 15%
If the yield from the two function are same give from 0-10% based on the amount of similarities.
The name function 30%
If the name of functions are a matching 30% given
If No matching give 0%.
NOTE: Cannot be a match with present 100% because the names of functions are very sensitive
Parameter : 50%e amount of similarities
Parameter Score (weight 50%):.

$$R1 = F1\ (P11, P12, P13, - .., P1n)\quad R2 = F2\ (P21, P22, P23, ..., P2m)$$

…………………… .1

Table 4 Table used for determine the **Expected Reuse for a function**

Original	Variations	Comments
Error	err, errors	err is an abbreviation of error.
revision	Rev	rev is an abbreviation of revision.
terminate	Term	term is an abbreviation of terminate.

Table 4: shows an example of (DMS) Debt Management System

message	msg, messages	msg is an abbreviation of message.
Jobfile	Job	job is an abbreviation of jobfile.

Table5. An example of (DMS) Debt Management System

Determine to Expected Reuse Score for function

ACE Term	MCD Term	Comments
Ace	mp	Library name
Ace	mtc	Library name
Ace	mpg	Library name
Acej	dp	Corresponding module name - ACE job file and MCD job file
Acev	mpgv	Corresponding module name - job file block verification
acebver	mpgbver	Corresponding module name - job file overall verification
acebinf	mpgbinf	Corresponding module name - input file
acebvrpt	mpgbvrpt	Corresponding module name – report

Table6. An example of (DMS) Debt Management System

(Fig. 1) Example of link from requirements document to design document, and design document to source code

At first, a requirements document for the new project is developed. This document is analyzed is compared with the requirements document of every project in the repository in order to identify whether there are any similar requirements in the existing requirements document. Such requirements are identified as potentially reusable. If the comparison of requirements document is positive (identifying one or more existing products), then the corresponding design and source code are also identified as potentially reusable. The design document and source code for those matching requirements documents are then retrieved from the repository. The reusable design and source code typically need some modification to work for the new project. Therefore, some modification work is applied to the existing design document and source code and later used as the design document and source code for the new project.
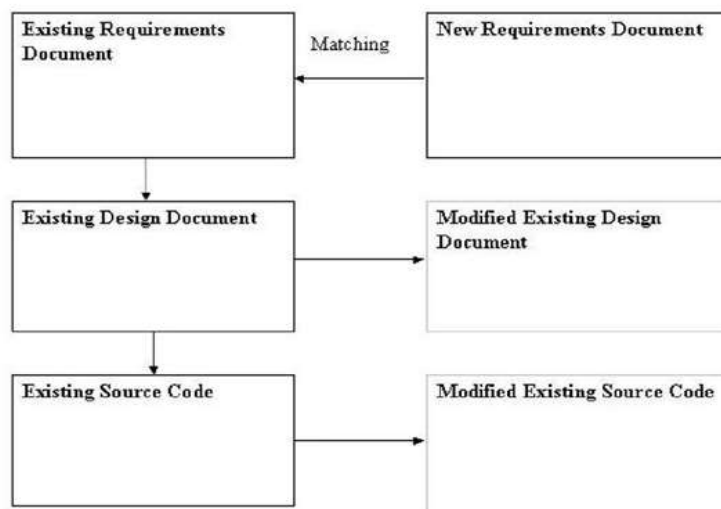
(Fig. 2) Example of link from requirements document to design document, and design document to source code.

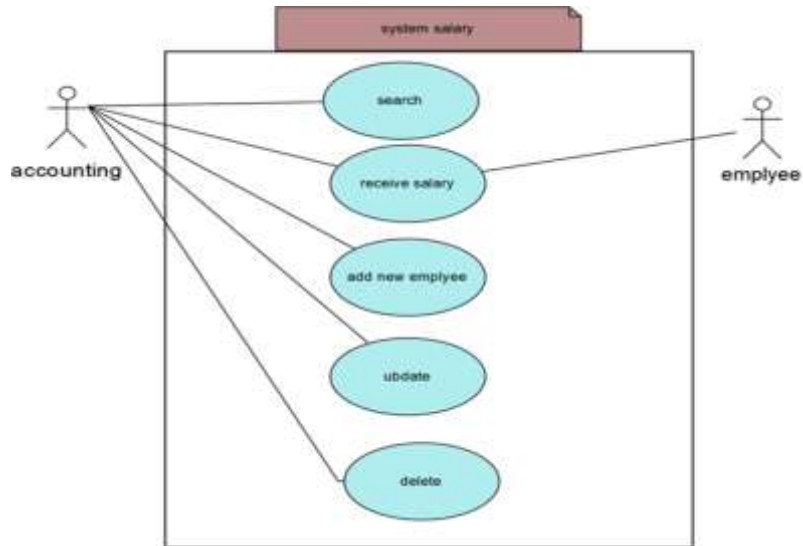**Implementation and design**
design (use case for first program)

Fig. 4 show use case for SMS
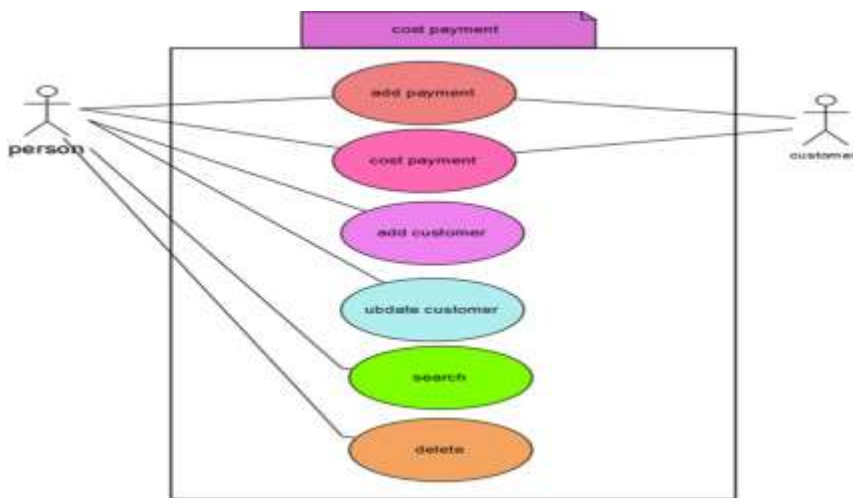
Design (use case for third program)

Fig. 6 show use case for DMS

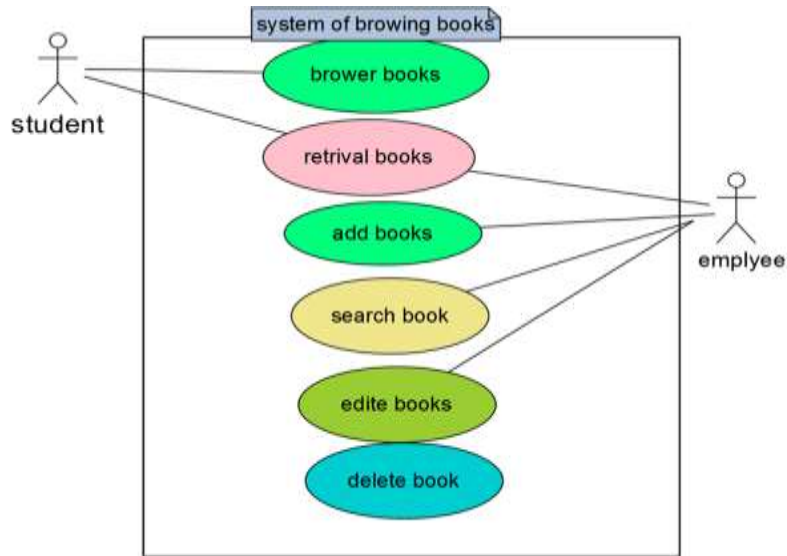Design (use case for second program)

Fig. 5 show use case for BBS

All three designs created with using EdrawMax program.
The first design has done without using reuse but the second and third were created from the first design using the concept of re-use,

implementation
All three programs implant by using visual basic as shows in figure

Fig. 7 show progam for SMS

Fig. 8 show program for SMS

Fig. 9 show progam for SMS

Outcome

In comparism the first program with second and thrid that dosen't use the reuse concept.

Whare the first program was using re-use concept and second and thrid programs that were with using re-use concept.
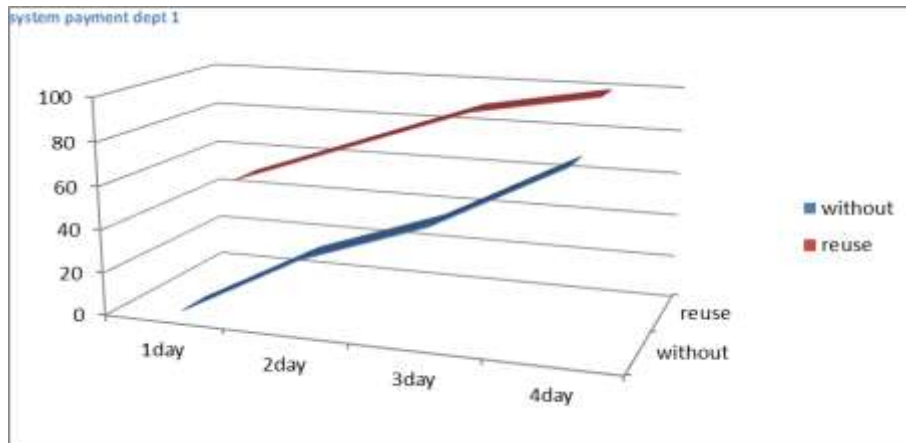

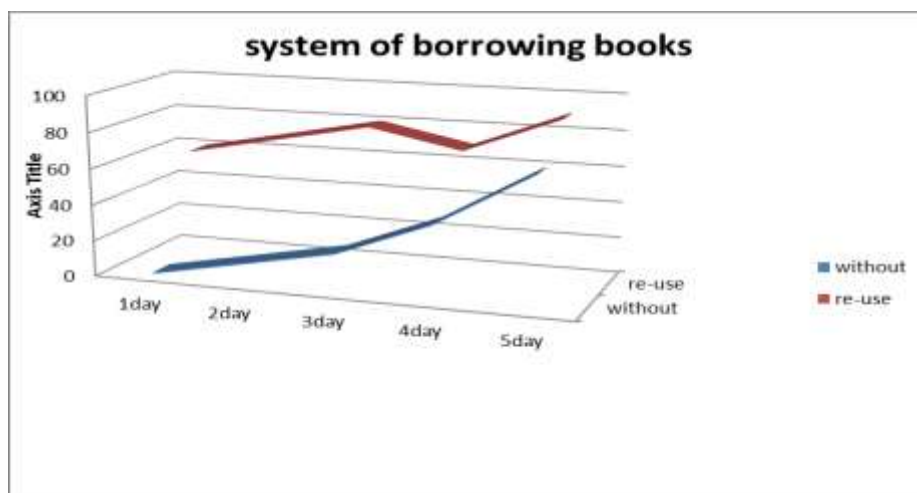*Fig.10 show the Completion rate depending the number of days for SMS program*

Fig. 11 show the Completion rate depending the number of days for BBS

Fig. 12 show the Completion rate depending the number of days for DMS

A view of the future
Despite the significant progress made in the field of software reuse, but this area which is part of software engineering it has tremendous applications can be used in systems expert and (critical systems) (accuracy systems) and wider and more multi-for reuse in the software will enter all applications programming shortly and also will be used in the field of study and education, because especially in Iraq now education depends on the education of the basics is argued to a great time in order to master the programming and the creation of applications and systems compete using software engineering in the future can solve this problem through the application of this principle and we are in this research we apply part of this perception Portal can be used in scientific research and by identifying a widget that can be reused and built upon, and has a large independent in the medical field, medical systems, it will go beyond a lot of problems, risks and time is less and cost less, and this is what an effect even on the side financial institutions and countries, and can utilize in the future of this research in solving a lot of problems the software autonomously without resorting to manufacturers and can also produce special software with the same efficiency and the lowest price, and there are the many areas that can use the principle of re-use.

CONCLUSION
In this paper we used the principle of re-use three different programs and deviation new and discerned that this proposed method has shortened the time twice has reduced the cost, we also got the required efficiency and extracted from this research that the principle of re-use can produce programs and develops a flexible and precise manner without reference to the well-known manufacturers of the software and has the same efficiency between research also said that this method has solved the problem the other way, which summed up to determine the proper function of the process

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