Development of a Web based financial application System

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Abstract. The paper describes a technique to develop a web based financial system, following latest technology and business needs. In the development of web based application, the user friendliness and technology both are very important. It is used ASP .NET MVC 4 platform and SQL 2008 server for development of web based financial system. It shows the technique for the entry system and report monitoring of the application is user friendly. This paper also highlights the critical situations of development, which will help to develop the quality product.

1. Introduction

Web based application is a software that can be accessed through the internet. The software and database are resided in a central server rather than being in the local desktop system. User can access over a network. Web based applications are the ultimate way to take advantage of today's technology to enhance the organizations productivity and efficiency. Finance system allows transferring the financial matters between savers and borrowers. An organization can operate on a global, regional or firm specific level. A financial services and systems can also be described as the comprising a set of complex and closely interconnected financial institutions, markets, instruments, services, practices, and transactions [1]. A software development is in view of the public, which means that anyone has access to the source code and can change, improve, test, and use it. Open source projects such as Firefox or the ERP Business Suite have produced high-quality results, indicating that bazaar-like software engineering models are effective [2]. Commercial financial systems are highly expensive to implement. Educational ERP wide area of application and now a day's educational institutes also looking for ERP implementation where finance is a mandatory module [3]. OS business model, based on a contribution of large number of individuals and partners, definitely affects the framework quality and rapid growth of the platform capabilities [4]. A survey was conducted showing that even within the 500 largest Polish companies only 50 % have an ERP-system, which in comparison with Western European companies is far less; for example in Germany 95 % of the companies with more than 500 employees have an ERP-System [5].

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A web based financial application gives an opportunity to access the business information from anywhere and anytime all over the world. It also facilitates to save the time, money and improves the interactivity with other customers and partners. The web-based applications are easy to use and to implement without any interrupt with the existing work process. It needs a content managed solution or an e-commerce system. It is developed a customized web application that fulfils the business requirements. Same web based software can provide the multimedia support to the end user. The developed web application is accessible from mobile phone and personal computer at the same time. There are many applications those can be accessible from mobile and personal computer but difference is that it is the financial system, which accessing a database having huge data and many stored procedure, a lot of triggering etc. A web based system has database server and browser interface integrated by web server as shown in Figure 1.

**Figure 1.** Basic Structure of a web based system.
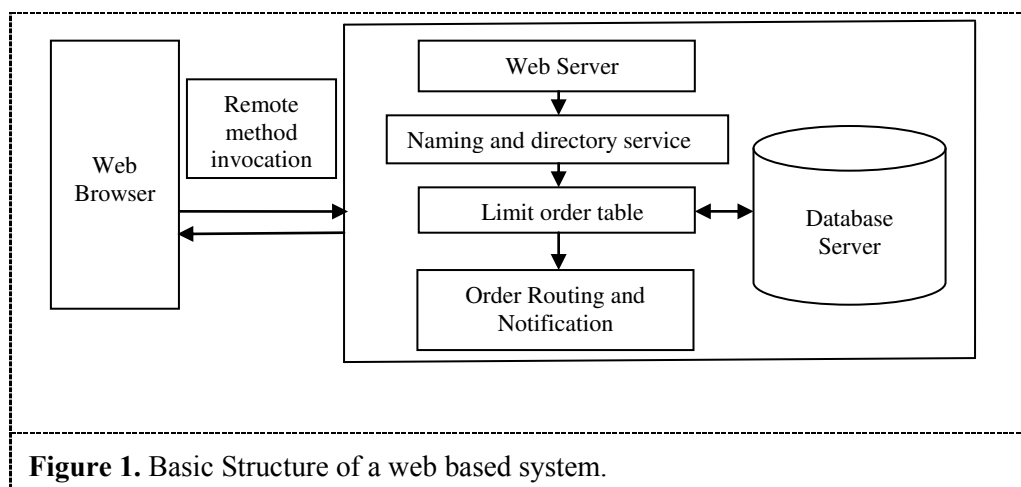
The rest of the paper is organized as follows. Section II describes the method of financial system development and design. Section III shows the results and section IV concludes the paper.

2. Method of development
Figure 2 shows a flow chart of a financial operation, where accounting year and voucher mode is to setup in initial state. Chart of account (COA) and opening balance for every COA is to setup initially. For every transaction the voucher id generation is mandatory.

Voucher id must be unique. Every transaction is saved in daily transaction table. This table is very important. In reporting phase it shows different accounting reports as the user requirements. A step by development of an accounting system is described as follows. In designing phase the important part is the COA.

F**igure 2.** Flow chart of financial operation.
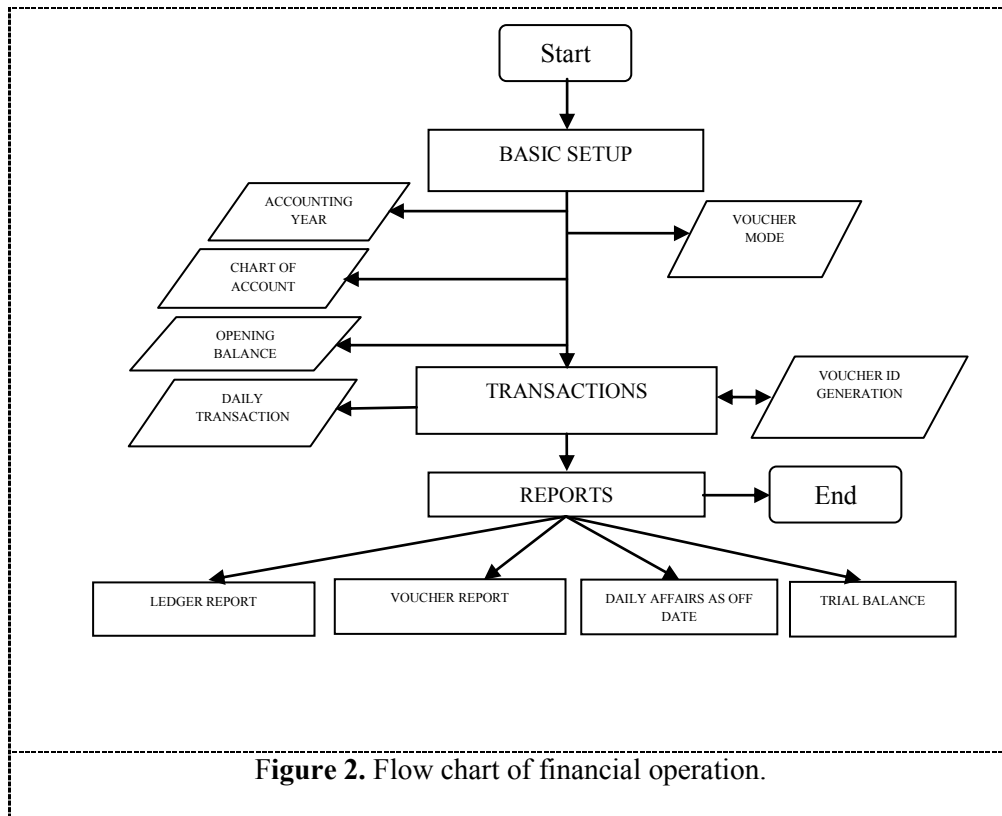
The COA provides the necessary information and structure of the nominal accounts which allows the overall picture of a company's financial health. Figure 3, shows a sample COA of an organization.

Figure 3. An example of a chart of account.

The actual structure of the COA depends on the structure of the organization. It depends on the type of business that a company is involved, and the type of information needs to the business owner or accountant. However, there are some basic elements of a COA and independent on the company. The common element of a COA is as follows:

- Assets
- Liabilities
- Income and

- Expenses

The assets and liabilities are generally included under the balance sheet items section. The income and expenses are in under profit and loss section. As a result, the 'top level' of the COA is just two sections such as:

- Balance Sheet Items
- Profit and Loss Items

The assets and liabilities etc. are the children of these sections.

- Balance Sheet Items
    Assets
    Liabilities
- Profit and Loss Items
   Income
    Expenses

The total assets and liabilities make up an overall total for the balance sheet items. Similarly, the total income and expenses make up an overall total for the profit and loss items. These are provided the basic information of an account. The profit is calculated from the income minus any expenses incurred, and is given as overall picture about the profit and loss.

For designing the COA the following problems need to be maintained:

- Reduce the no. of general ledger accounts
- Details of the selling general and administrative expenses
- Not enough detail in revenue and cost of goods sold categories
- Not using a numbering system
- No logic in assigning general ledger account numbers
- Too many digits in chart of accounts numbering

This is also a very crucial step to design the COA. The funds of a company accounts is started from new financial period and called the opening balances. The opening balance is the first entry of an organization accounts, either this are first starting up or at started of a new financial year. The opening balance is found from the credit or debit side of the ledger that is depending on whether the firm has a positive or negative balance. At the end of an accounting year a firm takes the closing balance - and carries it forward to the new financial year accounts, then becomes the opening balance for the first entry in the new financial year. The opening balances are also become important if a firm transfers their accounts to a new accounting system. When this occurs, the last entry of the previous accounts is become the opening balance in the firm's new accounts. At the starting of a financial plan, the opening balance is found in the opening balance sheet. An opening balance data of a firm is the opening balance sheet comes from the end balance sheet data of the previous accounting period. In the case of a new company, the opening balance sheet usually has just two accounts such as being the cash on hand and one being the capital contributed by the company's founders.

The main part of transaction is the journal/voucher. Voucher is written instrument that serves to confirm or witness (vouch) for some fact such as a transaction. Figure 4, shows an example of a Voucher entry form. Generally, a voucher is a document that shows a goods status, authorizes payment, and indicates the ledger account(s) in which these transactions have to be recorded.
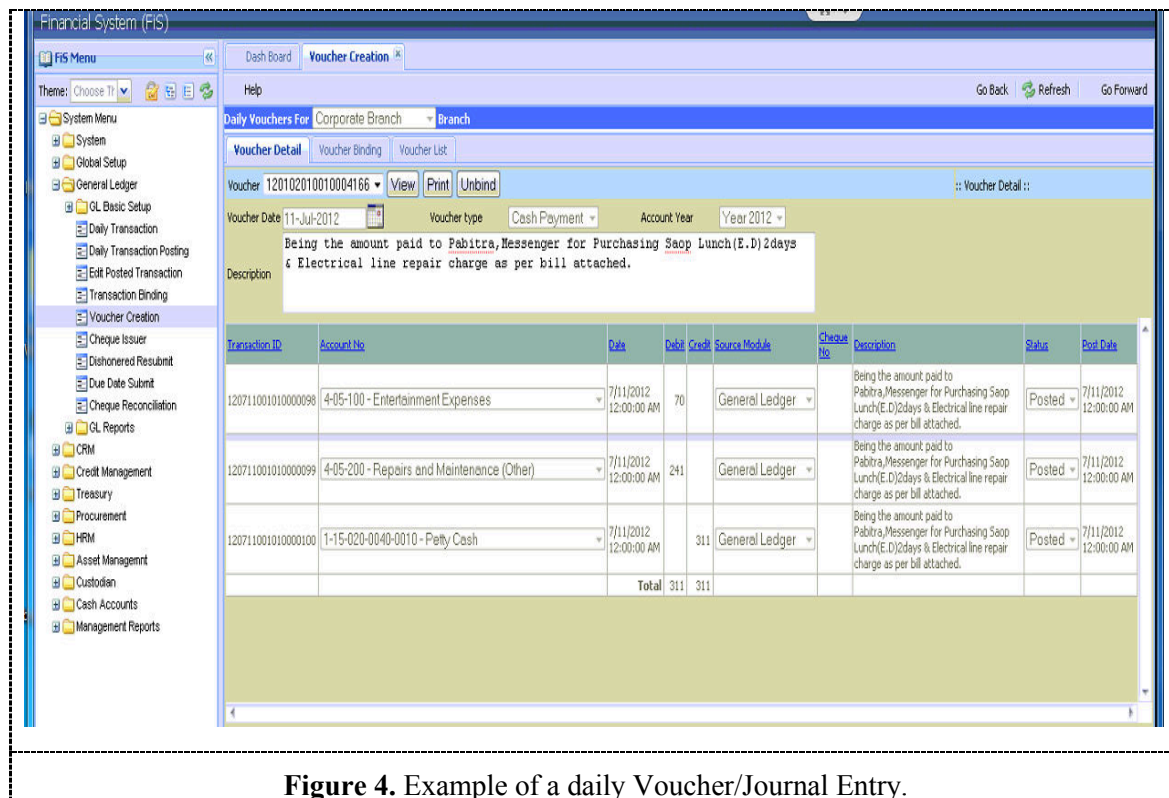
Figure 4. Example of a daily Voucher/Journal Entry.

Voucher is important since much record comes from there. Then a voucher needs to identification with a date and a number combined format. Voucher number should be a unique number. A voucher number creation is as follows:

- It should be an unique number
- It's number should not be editable
- Voucher/Journal is also not be editable

Figure 5 shows an example of Voucher/Journal. Editing is not allowed after the creation of a voucher. It is only can delete by the permission of the proper authority. This is a web application, so it follows the technology that supports the web. We have used ASP .NET MVC for design platform. For smart phone, it is used MVC 4. MVC 4 is supported for both the personal computer and mobile display respectively. The SQL server is accessible by both mobile phone and personal computer device with the help of ASP .NET MVC 4.

The agile development technique is used for the proposed system. The agile development is an umbrella term for several iterative and incremental software development methodologies. Figure 6 shows the agile development work flow. The most popular agile methodologies include extreme programming (XP), scrum, crystal, dynamic systems development method (DSDM), lean development and feature driven development (FDD). While each of the agile methods is unique in its specific approach, they all share a common vision and core values. They are fundamentally incorporate iteration and the continuous feedback that it provides to successively refine and deliver a software system. All involve continuous planning, continuous testing, continuous integration and other forms of continuous evolution of both the project and the software. All of them are lightweight (specially compared to traditional waterfall style processes), and inherently adaptable. They all focus on empowering people to collaborate and make decisions together quickly and effectively.
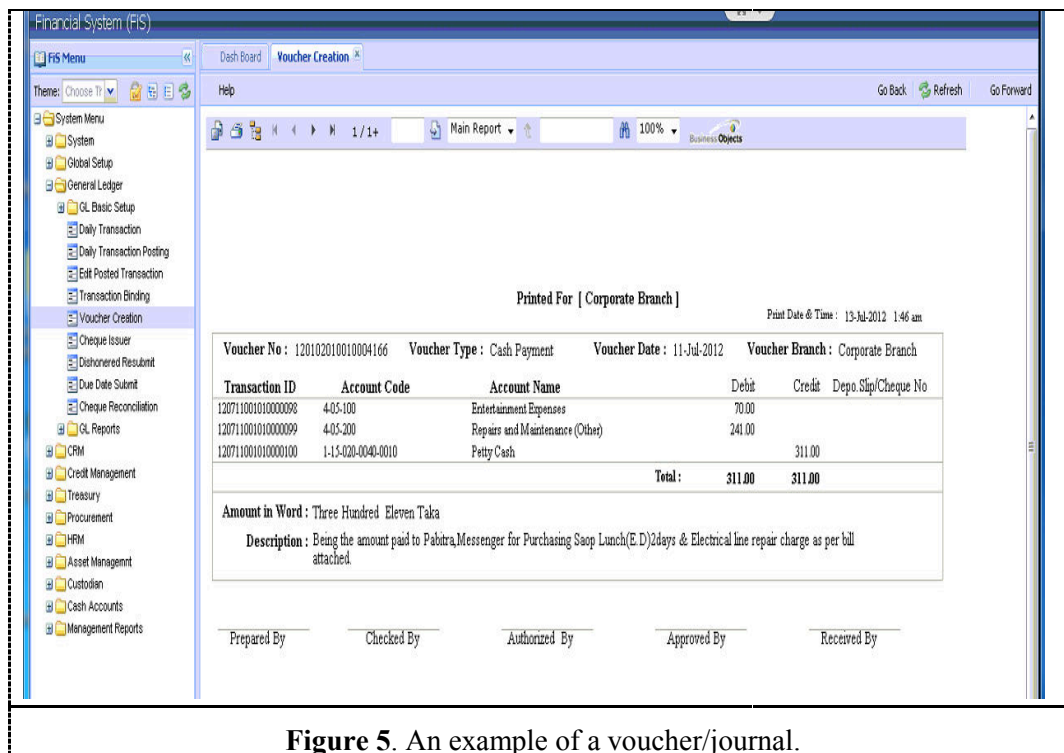
Figure 5. An example of a voucher/journal.

Many of the individual principles and practices that are promoted by agile development have been around for years, even decades. As opposed to implementing these best practices piecemeal, agile methodologies have packaged to various customer, management and in some cases, engineering practices and principles together in a way that helps guide teams through the process of rapidly planning and delivering working, tested software. Each of the agile methodologies combines both old and new ideas into refinements that are certainly greater than the sums of their parts [6].

Figure 6. Agile development process. This cycle normally completes every development day.
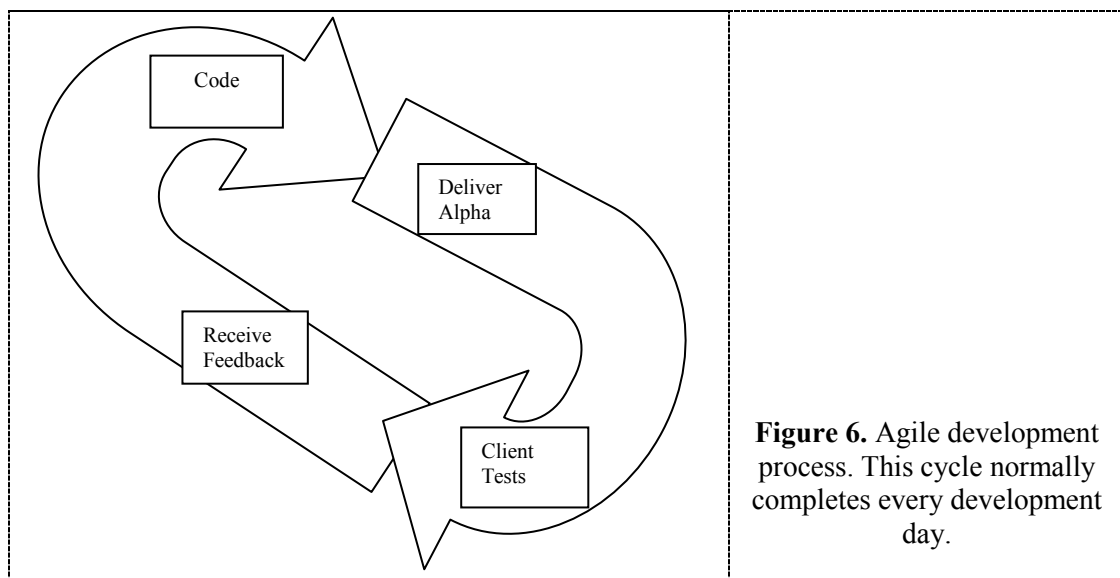
While it is true that many of the practices associated with agile development have been around for quite some time, the average software development team has yet to embrace many of the principles

and practices. Even today, the average software team does not iterate, does not deliver software incrementally, and does not practice continuous planning nor automate testing.


Figure 7. Mobile Interface of a user registration.

Now that these practices have been combined in a manner that can more easily be understood and adopted, the trend appears to be rapidly changing for the better, especially during the last several years. As with any new way of doing business though, Agile methods have generated quite a bit of controversy within the software community. Yet since their emergence, in project after project, they have continued to deliver higher quality software systems in less time than traditional processes. Figure 7 shows the mobile interface for user to first time registration. The data will directly hit the Server.

3. Results and discussion
Recently QuickBooks, tally, OpenERP etc. a lot of financial solutions and ERP are available in the market. In tally and quickbook there are not proper database in open source version. So, customization is very difficult there. OpenERP is open source software, having all ERP modules. But problem in openerp is that it's open source version is not user friendly for setup and use. Also, in all those financial solutions when we try to access from mobile then it will save first in android or other mobile database the will save in database for software for synchronous operation or, for every view it requires to create different view for mobile using and personal computer using. But, here it uses only 3-tier architecture for both mobile and personal computer users as shown in Figure 8.
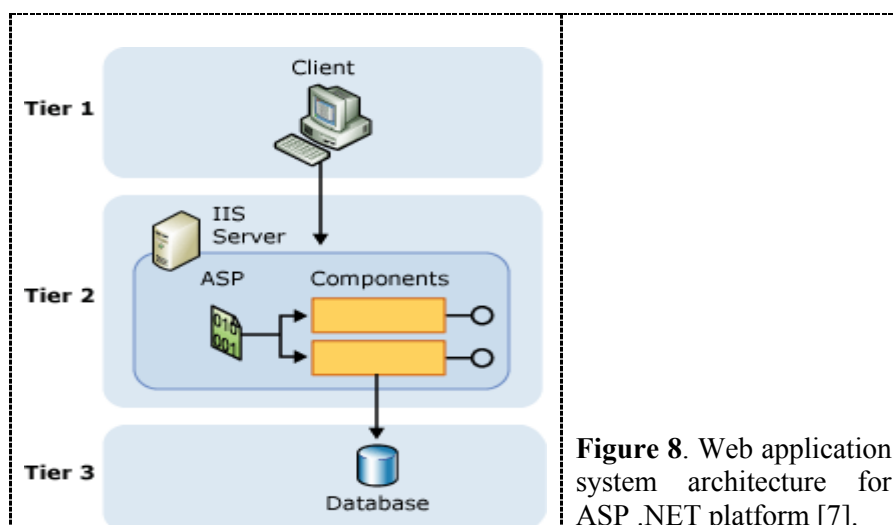
Figure 8. Web application system architecture for ASP .NET platform [7].

Because, in financial solution there are always two user parties some are mobile phone users and some are personal computer users. For concurrent use in the same time with mobile and computer with the same data is a big challenge now-a-days. So, it has used MVC 4 version of ASP .NET to make it faster. Here, tier 1 is the client side. Tier 2 is for ASP component of IIS and database is in tier 3. This work is initial step to solve those problems.

4. Conclusion

Based on the web application it described a financial system. The proposed system can be accessible by mobile phone and personal computer using the same page view. Target of this web application is to make it open source and user friendly. The development technique and design are briefly discussed here. Without a loosely coupled architecture all the new requirements will be tuff to fulfil. So, for preparing a loosely coupled system here Chart of Accounts, Voucher/Journal, opening balance properties etc. have described in a brief.

5. References

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