

# Reusability concept using an “M” Component Based Model

Dr. Manju Kaushik

Dept of Computer Science

Maharishi Arvind Institute of Science and Management, Jaipur, Rajasthan, India

## ABSTRACT

*One of the major challenges to industry today is to provide products with high degrees of quality and functionality at low cost and short time to market. The cost and time to market requirements have quite successfully been addressed by the component-based approach. This paper presents “M-Model” for component-based software development. It will help people understand concepts of component technologies more easily and also it could be used as a standing point to develop a formal testing and verification methodology for component technologies. To implement the “M-Model”, we have develop the component Online Test Conducting System (OLTCS) on the basis of “M-Model” and place the component OLTCS in storage pool, We have review Online Recruitment Process and reuse (OLTCS) in Online Recruitment System (OLRS) project on the basis of selection of right component for reuse using “M- Model”.*

**KEYWORDS:** Reusability, Component-Based Development (CBD), CBSE, OLTCS, OLRs.

## INTRODUCTION

It was imperative to have software development model which serves as an outline for developing good, functional and maintainable software. But the need for computer software development is fast growing in our society today. A consequence of all this is that software is becoming increasing large and complex. Traditional, software development addressed challenges of increasing complexity and dependence on external software by focusing on the one system at a time and on delivery deadlines and budgets, while ignoring the evolutionary needs of the system. This has led to a number of problems like failure of majority of projects to meet their deadlines, building projects from scratch, budget, quality, cost and software maintenance. To meet these challenges software development must be able to cope with complexity and to adapt quickly to changes. The key to the solution is reusability. From this perspective Component-Based Development appears to be the right approach. Various component based models have been developed for

component based development which focuses on component reuse because components are a field that promise a rich harvest in productivity through reuse. All component based models have some limitations in developing effective and efficient software. So we are introducing an “M-Model”- a component based software process model to enhance the concept of reusability, development of an application become easier with component search. The motivation behind introducing or developing “M-Model” is the reuse of components, to reduce cost, time to market, meet rapidly emerging consumer demands, and produce more functionality, quality and reliable software. For implementation, only one module of OLTCS will be developed using “M-Model” methodology.

## HISTORY

Since the beginning of software development which was somewhere in the late 1940s, various software types have gone through many stages of evolution. It has evolved steadily throughout the ages and



component based software models, providing a useful guideline for developing component based software. The goals in designing and implementing a component based software development system, **Online Test Conducting System (OLTCS)** to build a platform for verifying the applicability of our model to the software development task. With OLTCS, we should be able to check how easy or difficult it is to develop a system using our model. It is also hoped that OLTCS might be used to help people understand the concepts of component-based software.

#### Overview of OLTCS:

The main objective for creating the Online Test conducting System is designed for Conducting Examination for the candidate in technical Subjects. The system can be utilized as a tool for Conducting Exams. This is an efficient technique to reduce paper work and entries. This module also generates the results based on the Exams given by the candidate. The main objective of Online Examination is to efficiently evaluate the candidate thoroughly through a fully automated system that not only saves lot of time but also gives fast results.

#### Develop the component OLTCS on the basis of “M-Model”:

With the help of “**M- Model**” we not only develop a new component but also reuse the newly developed component, taking into consideration this concept, we have developed a new component/ project which has been named as **Online Test Conducting System (OLTCS)**. The first phase of “**M- Model**” is called Development for Reuse. For the future use of OLTCS we specified an area in which the component has to be developed and then after finalizing the test exam field the framework was prepared, taking into consideration the related entities, some of the entities from this framework were used and the remaining were saved in archiving for use in future. All component related functions and entities were composed or

assembled in the common library. Then to develop OLTCS all the steps namely requirement analysis, system design, coding, testing, implementation and maintenance were used. Hence a complete system was developed. Some of the snapshots of developed OLTCS are:



Figure: Online Test Conducting System (User Login)

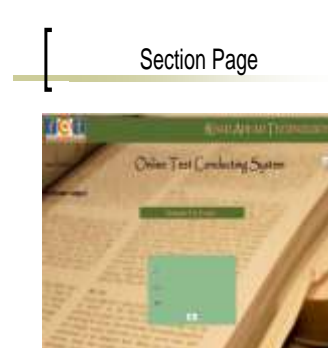


Figure: Online Test Conducting (Section Page)

#### Placement the component OLTCS in storage pool:

“**M- Model**” is categorized by the storage of system/component developed for future use. It is stored in component storage pool. Before saving the developed component system in the storage pool. It has to be decided which level the same belong to. Once the level has been decided on the basis of parameters it is stored in the same.

**Overview of online recruitment process:**

*Online Recruitment System (OLRS)* is an online website in which jobseekers can register themselves online and apply for job. Online Recruitment System provides online help to the users all over the world. Using web recruitment systems like recruitment websites or jobsites also play a role in simplifying the recruitment process. Such websites have facilities where prospective candidates can upload their CV's and apply for jobs suited to them. Earlier recruitment was done manually and it was all at a time **Reuse (OLTCS) in OLRS on the basis of "M- Model":**

A recruitment company was using an online recruitment process based on specific criteria, written test was being conducted for the selection of candidates who had applied online. This process was tiresome and lengthy and has many problems. The first problem is that there are loads of hard copied documents being generated. So, by using the phases of "M-Model" we have reuse OLTCS in OLRS.

- **Selection of right component for reuse:**

The component storage pool is searched for the component required by the developer. The search was conducted according to the parameters, which takes lesser time. The components are selected after the search completes. The right component is searched the basis of parameters and then validated. If none of the selected components match the requirements the component closest in nature is selected for further optimization and updating to match the requirement. The right component is the OLTCS component is added to this project OLRS with the help of third phase i.e. called development from reuse, fourth phase i.e. testing phase and fifth phase i.e. implementation phase of "M- Model".

- **Reuse OLTCS in OLRS:**

CBSE promises many advantages to software development including reuse, managing complexity, and reducing

consuming work. Now it is all possible in a fraction of second. It is all done online without much time consuming. Today's recruitment applications are designed to do a whole lot more than just reduce paperwork. They can make a significant contribution to a company's marketing and sales activity. Recruitment websites and software make possible for managers to access information that is crucial to managing their staff, which they can use for promotion decisions, payroll considerations and succession planning.

development time, effort, and cost. So with the help of "M-Model" which follows the concept of component based software development. We have reused the component OLTCS in OLRS. We have shown reuse by the diagram of running project below:



Login page of OLRS.



OLRS without Reuse of OLTCS component (Exam)





After Reuse of Component OLTCS (Exam) in OLRS

### ADVANTAGES OF USING “M-MODEL”

- “M-Model” is used for fast development and delivery of a high quality component based system at low investment cost.
- The ability to rapidly change system design as demanded by user.
- Generally produce a dramatic savings in time, money, human effort.
- “M-Model” enhances the productivity of s/w as we need not to develop the application from scratch, the existing reusable components are assembled for development of new software.
- Easy Planning.
- Clear requirements.

### LIMITATION OF “M- MODEL”

- While working with “M- Model” some limitations have been found. Using “M-Model”, through the addition of succeeding builds is easy but in case of design errors they may become difficult to remove.
- Using this model the dependability increases on the system hence one may avoid checking and inspecting before testing the complete system.

### CONCLUSION & FUTURE SCOPE

To evaluate methodologies are always thought as a difficult task since different writers of methodologies might have various criticism views. This paper introduces a simple set of views to design, implement and validate the “M- Model”. This model is best suited for different levels of complex system’s development. We focus on life cycle stages that “M- Model” addresses. It is clear that “M -Model” aims to develop component and reuse the component for developing computerized information systems.

We have implemented “M-Model” through developing the component Online Test Conducting System (OLTCS) on the basis of “M- Model”, placement the component OLTCS in storage pool and reusing OLTCS in Online Recruitment System (OLRS) on the basis of “M-Model” by selection of right component for reuse. This results in the reduction of cost and time and makes the software more reliable and efficient. This model may require further improvement with the change of technologies in this fast emerging field.

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