International Journal of Computer Science Engineering and Information Technology Research (IJCSEITR)
ISSN(P): 2249-6831; ISSN(E): 2249-7943
Vol. 4, Issue 1, Feb 2014, 43-56

TRANS STELLAR
• Journal Publications • Research Consultancy

AN ADAPTIVE DESIGN PATTERN TO BUILD MULTI-MODAL SYSTEM ARCHITECTURE IN DISTRIBUTED ENVIRONMENT

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ABSTRACT

Within the last two decades, the World Wide Web (WWW), more commonly known as the web, and it is Distributed System Architecture (DSA) which is the collection of independent system with own resources but users experience as a single system; it is totally integrated system instead of several independent systems, and it has ability to autonomously manage each system. Hence it provides optimum functionality and flexibility. WWW has become the main platform for deploying business and social application and organizational information systems. Many organizations have extended the scope of their web-based systems as well as begun to provide mobile and wireless access to them. Therefore, web-based applications now present an array of content and functionality to a huge number of users and carry out many different purposes.

There are so many web applications based on multimodal interaction are available, which provides different types of multimodal and content services like video/audio chat, text chat services, desktop sharing services and mobile related services (e.g. SMS services). Distributed Multimodal System (DMS) includes the multimodal interaction. Multimodality refers to the process in which different devices and user are able to interact aurally, visually, by touch or by gesture. Ubiquitous computing refers to this interaction happening anywhere, anytime, using any device, often in order to increase the accessibility and improve the user experience.

Modeling multimodal interaction is very difficult, due to the multiple input and output channels, modes and the combination of possibilities between data coming from different sources, not to mention output modality selection based on context and user profile. The huge challenge of multimodal interface creation is to build reliable processing in the multimodal system to analyze and to understand multiple communications means in real-time. There is need to specify a suitable pattern to create a platform which is able to provide multimodal interactions between user with multiple I/O modalities and several semantic services developed by third-party agent and consumed through a presentation, in order to make content more accessible and interactive; in distributed environment.

In WWW, Each one application is only dominant on particular type service as well as most of them are executed on desktop based environment. Hence, these web applications are building with different types of design patterns which are having with its own design methodology to build a particular web application. The general purpose of this research is to develop the applications having with an adaptive design pattern which provides multimodality and deployment of multimodal, content and ubiquitous services in efficient manner for people with distributed system (e.g. Internet). Hence, designing multimodal approach, along with the traditional computing environment or with the ubiquitous environment, is always a challenging task in the HCI field.

Hence we discover a service-oriented architectural (SOA) pattern is the best solution for modeling the DMS. Service-oriented architecture presents an approach to build the distributed system that deliver application functionality as web services to either end-user applications or other services. Applications must be developed as independent sets of interacting services offering well-defined interfaces to their potential users. Similarly, supporting technology must be available to allow application developers to browse collections of services, select those of interest, and assemble them to create the desired functionality.

We have presented a service oriented approach to build the DMS by using an adaptive design pattern Model-View-Controller (MVC) which managing all data and interactions among the users, the system and the external services. Hence the SOA implementations continue their egression in application development for integrating organizational operations in different ways as well as for elevating reuse while leveraging the existing value of legacy systems. It means at the application level, the online presenter can deliver the presentation to attendees which are the part of conference and the interaction between them with multiple I/O modalities such as audio/video chat, text chat as well as desktop sharing services.

KEYWORDS: WWW (World Wide Web), **DSA** (Distributed System Architecture), **DMS** (Distributed Multimodal System), **HCI** (Human-Computer Interaction), **SOA** (Service-Oriented Architecture), **MVC** (Model-View-Controller)