

MetaPage

A Data Intensive MockupDD for Agile Web Engineering

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Abstract: The dramatic growth of the Web and the richness of dynamic user interfaces have forced to adopt model driven paradigm in web application design process. However the need to better synchronize with customers has lead to consider new web application development through the use of frameworks such as mobile first app development platforms in which the development process is carried out following agile paradigm. For example in ORION or XDK mobile web frameworks the mobile first approach forces developer to adopt skeleton or templates in the design process. As consequence could be of interest to explore how mockups could be inserted at conceptual level in the design process. In a first work towards this direction ((McDonald and Welland, 2003)), it has been discussed how agile techniques and in particular mockup driven methodologies, could be introduced to refine user interface models and to generate in a semi-automatic way UML models. In this work we propose an agile approach to MDWE methodologies (called Data Intensive Mockup-Driven Development, or DI-MockupDD) by introducing a *mockup based dynamic data binding mechanism*. As a result, we get an example of agile a prototype-based iterative process which is data intensive.

1 INTRODUCTION

The dramatic growth of the Web and the richness of dynamic user interfaces have forced to adopt model driven paradigm in web application design process. Starting from the Conallen Web Application Model((Conallen, 1999)), many important model driven frameworks have been studied and intensively applied to web-based information management systems. However the need to better synchronize with customers has lead to consider agile techniques and in particular mockup driven methodologies which have been introduced to refine user interface models and generate in a semi-automatic way UML models.

In particular, the need to have a Short-development life-cycle time also for web design is forcing many teams to develop javascript pages with rich interfaces and without referring to external reloading information coming from server or other programming technologies. Many pure javascript Libraries are available for fast web development process strictly based on javascript frameworks. Designers are attracted by fast development cycle provided by javascript frameworks (espresso and meteor) even if available examples are quite easy (TO DO, blog, mini portal etc.).

Agile Web Engineering (AWE) Process has been

introduced in (McDonald and Welland, 2003) and one of the last proposed MD Web development platform that has some agile issues has been described in (Cicchetti et al., 2009).

In this scenario, one of the first attempt is described in (Rivero et al., 2011) in which mockup models have been manually enriched by following a tagging procedure. This solution then could be used to generate abstract UML models. However this process requires heuristics to complete the UML model definition because it relies only on presentation model derived from UI mockup without content definition. As consequence, MockupDD-WE with tagging extensions must be considered a partial MockupDD since the user is forced to associate content information by tagging user interface components. In this work we propose, instead, a data intensive MockupDD based on the extended model generation obtained by introducing a *mockup based dynamic data binding mechanism*. The idea is to make use of mockup prototypes not only for presentation definition but also to automatically complete UML data content definition in a dynamic way by performing a data binding over the prototype. This is obtained by means of a set of Mockup canvas HTML5 *data touch operations* which can be applied to the GUI prototype.

2 THE MOCKUP DRIVEN METHODOLOGY

We aim to introduce a mockup-driven platform based on flexibility of HTML5 concepts such as canvas programmed as general IDE for target application in which many of Model Driven Web engineering concepts are embedded (content, navigations and user interface tags). The motivating reason is to have a new type of web frameworks which share the advantages of mockup driven engineering methodology with the ones of model driven engineering approach without forcing user to work on different tools. The Figure 1 shows the overall organization that combines a mockup wireframe editor with corresponding HTML5-Javascript library used both for GUI editing and for prototype execution.

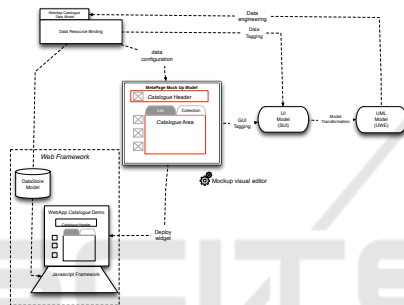


Figure 1: The MetaPage Mockup-driven Agile Web Engineering Organization.

This organization will be used in the context of web engineering development process that combines the mockup driven phase with modeling phase and hence could improve the usage of web engineering from agile teams. Figure 2 shows the iteration process running an example of agile web engineering development in which Mockup driven phases and Modeling phases are used to generate intermediate models and prototypes by following an agile iterative process.

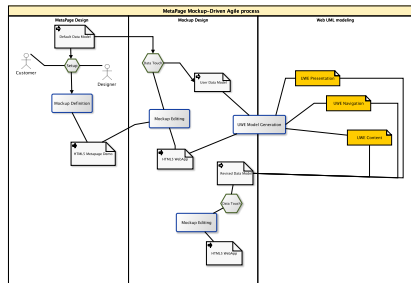


Figure 2: The Agile Meta Page MDD Process.

Note that to obtain output results from each modeling phase it has been used a specific GUI activity

node in which the user makes use of suitable interactive operations carried out on the Mockup interface by combining cursor and windowing operations with embedded tagging system. This fact leads to consider a new set of Mockup GUI operations called *data touch* operations in which the user is able to perform a model definition by clicking and selecting GUI components with cursor and windowing redefined in accord to MetaPage model. The next two figures outline a brief description of such data touch framework by evidencing the relationship between Mockup definition and corresponding UML derivation in the context of UWE modeling language.

3 DATA TOUCH MODELING OPERATIONS

In Figure 3 we have described two example of data touch tag naming used to associate name values to GUI elements denoting instances of corresponding presentation class. The idea is to define as data touch cursor a new type of extended cursor called *MetaPage data touch cursor* which is obtained by including in the corresponding mouse icon the given class name label.



Figure 3: Data Touch Presentation Naming: MetaPage Cursor operations.

Instead, in the case of navigation naming labels, Figure 4 shows how the corresponding Class navigation diagram is generated by considering Mockup operations according to an extended windowing system called *colour-based MetaPage data touch windowing system*.

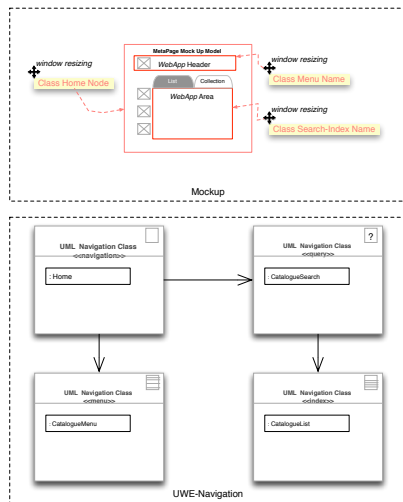


Figure 4: Data Touch Navigation Naming: MetaPage Colour-based Navigation System.

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4 CONCLUSIONS

In this paper we have introduced an agile web engineering methodology that extends the MockupDD for UML Web Engineering, by considering a Data intensive Mockup DD Process aimed to design data intensive Rich-Internet Applications by combining Agile Development with classical Model Driven Web Development process in a unique visual framework. Our approach starts by the requirement analysis obtained through mockup definition with data models applied to a generic Web catalogue example. Then we consider the data binding mechanism in detail and show how it can be used to generate in automatic way an example of model transformation which generates in an automatic way, a complete UML model for a different example of catalogue (BookStore) starting from Music Catalogue UML Model.

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