

SAP Research RoofTop Marketplace¹

Volker Hoyer

Florian Gilles

Kathrin Fleischmann

Alexander Dreiling

Katarina Stanoesvka-Slabeva

SAP Research St. Gallen
University of St. Gallen
Blumenbergplatz 9
9000 St. Gallen
Switzerland

SAP Research St. Gallen
Blumenbergplatz 9
9000 St. Gallen
Switzerland

SAP Research Brisbane
133 Mary Street
Brisbane QLD 4000
Australia

SAP Research Brisbane
133 Mary Street
Brisbane QLD 4000
Australia

University of St. Gallen
Blumenbergplatz 9
9000 St. Gallen
Switzerland

volker.hoyer@sap.com

florian.gilles@sap.com

kathrin.fleischmann@sap.com

alexander.dreiling@sap.com

katarina.stanoesvka@unisg.ch

ABSTRACT

Enterprise Mashups have gained momentum in the last years. Business users with no or limited programming skills are empowered to leverage in a collaborative manner existing mashable components. By combining and reusing Web-based resources within minutes, business users are able to create new value added applications to solve an individual and ad-hoc business problem. In this demo, we show the SAP Research RoofTop Marketplace prototype that transfers established marketplace concepts and principles to the Enterprise Mashup paradigm in order to handle business and organizational challenges of the Mashup paradigm in enterprise environments.

Keywords

Enterprise Mashups, Electronic Markets, Internet of Services.

1. INTRODUCTION

In the literature, the exact definition of Enterprise Mashups is open to debate. In this work, we refer to the definition of Hoyer et al. [1]. “An Enterprise Mashup is a Web-based resource that combines existing resources, be it content, data or application functionality, from more than one resource in enterprise environments by empowering the actual end users to create and adapt individual information centric and situational applications”. By simplifying concepts of Service-Oriented Architecture (SOA) and by enhancing them with the Web 2.0 philosophy of peer production, Enterprise Mashups focus generally on software integration on the user interface level instead of traditional application or data integration approaches. In contrast to SOA which is characterized by high technical complexity of the corresponding standards (i.e. Web Service standards SOAP, WSDL, UDDI, BPEL, etc.) and requiring specialists' technical knowledge, the simplified Enterprise Mashups enable the integration of end users with no programming skills in the development process.

The relevant components of the Enterprise Mashup paradigm are resources, widgets, and Mashups and can be structured in an Enterprise Mashup Stack comprising three layers [1]: Resources represent actual contents, data or application functionality that are the core building blocks of Mashups. They are encapsulated via well-defined public interfaces (Application Programming Interfaces; i.e., WSDL, RSS, Atom, etc.) allowing the loosely coupling of existing resources – a major quality stemming from the SOA paradigm. These resources are provided by enterprise

systems or by external Web providers (i.e., Amazon, Google, etc.) and are created by traditional developers who are familiar with the technical development concepts. The layer above contains widgets which are responsible for providing graphical and simple user interaction mechanism abstracting from the complexity of the underlying resources. The creation of these widgets can be done by consultants in the business units who understand the business requirements and know basic development concepts. Finally, end users from the business units are able to combine and configure such visual widgets according to their individual needs, which results in a Mashup.

Key drivers of the Enterprise Mashup paradigm are reusing / composing existing building blocks in new ways – getting value out of prior investments - and the mass collaboration principle from the Web 2.0 wave. Thereby, lightweight composition is the enabling technology. The Enterprise Mashups paradigm separates between the wiring and piping composition. The piping composition integrates heterogeneous resources defining composed processing data chains concatenating successive resources. Aggregation, transformation, filter, or sort operations adapt, mix, and manipulate the content of the underlying resources. The visual composition of input and output parameters of widgets on the Mashup layer is called wiring. In addition to this lightweight composition style, the mass collaboration principle is also an important characteristic. The willingness of users to offer feedback to the Mashup creator, who may be unaware of problems or alternative uses, directly contributes to the adoption of the Mashup and can foster its ongoing improvement. Another important contribution of users is the inclusion of their Mashups in the available pool of components. The willingness of users to provide their Mashups for further reuse increases the number of available widgets.

Existing research efforts focus mostly on technical aspects and Mashup tools (like Yahoo Pipes, Microsoft Popfy, IBM Mashup Center, Kapow Mashup Server, Serena, etc.) to enable the easy integration of available components [3]. The discussion from a collaborative and peer production perspective is still missing in the scientific community and in the relevant Mashup tools [2]. In the frame of the SAP Research RoofTop Marketplace, we have developed a prototype which follows typical market transactions to handle the challenges of the Mashup paradigm in enterprise environments. In this demonstration, we showcase the features of RoofTop Marketplace covering typical market transaction phases.

¹ A video can be found at <http://www.mashupecosystem.com/sapresearchrooftop/>

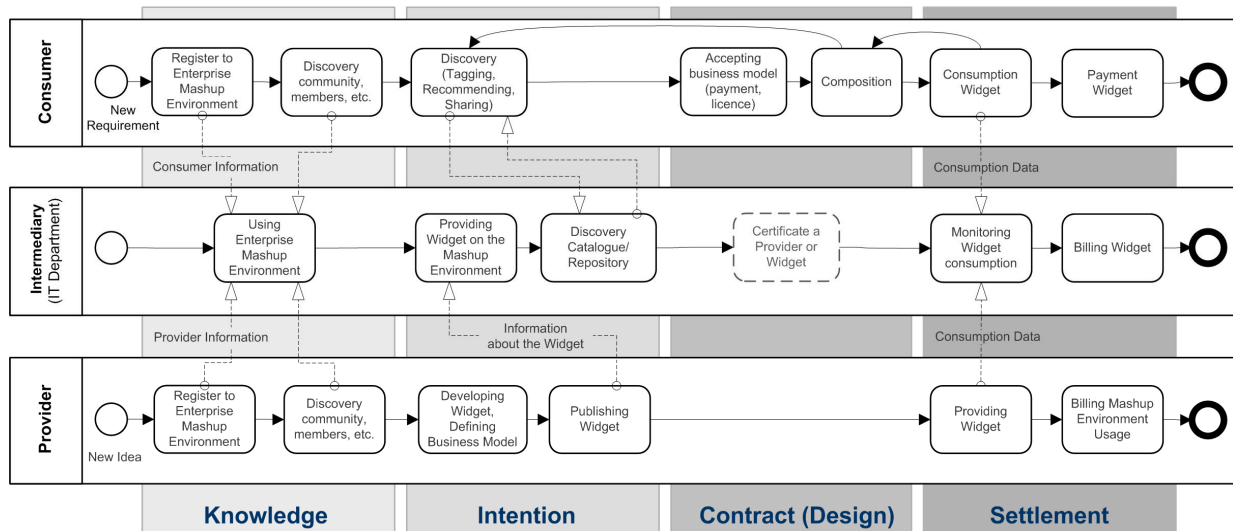


Figure 1: Market Phases in Enterprise Mashup Environments [2]

2. SAP Research RoofTop Marketplace

As analyzed by [2], Enterprise Mashups have similarities with electronic markets. Besides the support for easy integration of widgets, Enterprise Mashup environments also need to provide support for efficient management and matching of supply and demand for widgets and Mashups. In contrast to traditional SOA based solutions, the actual business user takes the role of the consumer as well as the provider. Small and reusable visual components can be traded and integrated into the individual working environment in an ad-hoc manner without contacting the specialists from the IT departments. The discovery and sharing of mashable elements is recognized as one important part of the Enterprise Mashups development process to reuse existing assets in new combinations.

These findings were used to design the SAP Research RoofTop Marketplace covering typical market phases. As a result, we developed an interaction process that specifies the required services for the standard user roles (consumer, provider, intermediary) in SOA environments. As depicted in Figure 1, the process is characterized by permanent loops between the converging design and runtime phases. The need to adapt the operational environment ad-hoc leads to adding, removing, or replacing existing mashable components.

Starting with the **knowledge phase**, the users of SAP Research RoofTop Marketplace (registration is done by Single Sign On) are able to find information about the offered mashable components (widgets and Mashups) and about the users in form of profiles. Specified individual preferences and user contexts (i.e., industry, department, country, etc.) allow the navigation within the Enterprise Mashup medium. By means of examples in form of short videos, the benefits of the Enterprise Mashup environment are demonstrated to potential users. Only if a huge amount of users are convinced of using the environment, it will exploit its actual potential. During the **intention phase**, users articulate their intention and needs such as wish lists or favorites. Concepts from the Web 2.0 philosophy, like rating,

tagging, or recommending are integrated for browsing through the growing number of offers (published and available mashable components). In case the consumer accepts the underlying business model (costs, payment model, consumption licence, etc.) of a widget that is defined by the provider, he can compose the component with others by connecting the input and output parameters of the widgets in the actual **contract (design) phase**. By certifying widgets or providers, indicating compatibility, trust or reputation aspects, the intermediary offers additional selection criteria to the consumers. In contrast to the classical software development, the design of ad hoc applications uses real resources and no demo systems. In this sense the consumption in the **settlement phase** differs only from the hidden configuration capability in contrast to the design phase. In case a new business situation comes up, the consumer shifts quickly to the design or intention perspective to adapt the individual operational environment. The traditional separated design and run time is converging and characterized by continuous return loops.

The SAP Research RoofTop Marketplace prototype itself is a Web-based application based on AJAX (Asynchronous JavaScript and XML) and is internally available to all SAP employees without any installation. During the demo, we will showcase the functionalities of all market phases as presented before. By means of a business scenario we will also demonstrate the business benefits by following a marketplace approach in Enterprise Mashup environments.

3. REFERENCES

- [1] Hoyer, V., Stanoevska-Slabeva, K., Janner, T., Schroth, C. Enterprise Mashups: Design Principles towards the Long Tail of User Needs. IEEE International Conference on Service Computer (SCC'08), Volume 2, 601-602.
- [2] Hoyer, V., Stanoevska-Slabeva, K. Towards a Reference Model for Enterprise Mashups. 17th European Conference on Information Systems (ECIS 2009), Verona, Italy.
- [3] Hoyer, V., Fischer, M. Market Overview of Enterprise Mashup Tools, In Proceedings of the 6th International Conference on Service Oriented Computing (ICSOC), Springer, LNCS, 5364, 2008, 708-721.