Questioning Mashups

Brigitte Endres-Niggemeyer

Rheinstr. 1A
30519 Hannover
Germany
brigitteen@googlemail.com

Abstract. Mashups have been defined in earlier development stages of the web. Their main motivation is to build new services from existing resources. This principle is still productive. Assumptions on what mashups take in, which interfaces and services they provide and where they are networked need an overhaul. Focusing on a reuse of resources exploiting all their affordances while opening wider ranges for all other features might bring the concept up to observable applications of today.

Keywords: Mashup, Properties, Application, Network, Interface, Media, E-Learning, Bionics, Automotives

1 What is a mashup?

"A mashup is a web application that uses content from more than one source to create a single new service displayed in a single graphical interface." [3]
According to this definition a web application qualifies as a mashup by integrating more than one source into a new service. It displays its activities on one graphical interface. Questions are skyrocketing on the spot:

- Imagine a mashup with two interfaces. Would you ban it from the mashup league? No. And probably all the same for non-graphical interfaces, such as audio interfaces.
- Let us next question the web constraint: What about items outside the web, such as a fridge or a flood gauge sensor? They take part. Communication over the web suffices. Any item that owns a URL can participate in a mashup. If the appliances of a household communicate over the local household WLAN, why should they not participate in mashup? Remind that mobile mashups are documented on Programmableweb[1] since 2005, the oldest one being Cell Reception[2] reporting on how the US territory is covered by different WiFi providers.
- Is a mashup obliged to declare that it is a mashup? No, it is not. A mashup is a mashup because it has the obligatory mashup properties, not because it is called a mashup. Clandestine mashups may be frequent: applications are mashups, but they do not know or do not mind.

[1] http://www.programmableweb.com/mashups/directory
[2] http://www.cellreception.com

– Excluded from the mashup league are applications that draw on one source only and that are definitively without any contact to a network / the web.

The basic mashup definition needs an overhaul. It may be outdated. Maybe more elaborated mixes of input media and interfaces overgrew the initial mashup concept, while the driving force of the approach became more and more popular: the reuse of existing resources for new purposes and services, exploiting all their affordances.

2 Mashup making

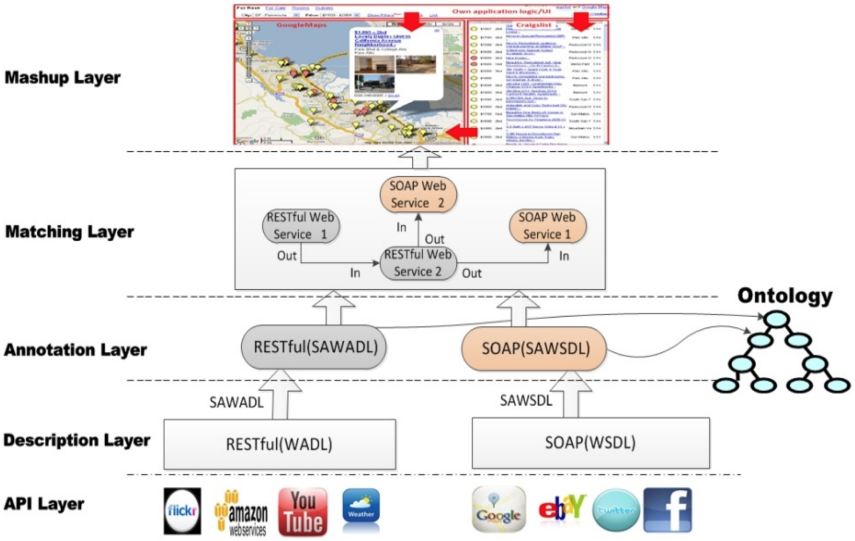

Fig. 1: Layer construction scheme of a semantic mashup from [4]

Before the advent of the web there were no (web) mashups, only their earlier namesakes in music. Indeed mashups depend on the plenty of APIs and data resources that the web ecosphere offers – all items owning a URL can participate in a mashup.
First and foremost, a good mashup idea is needed for a good mashup. A well-designed mashup may be easy to understand. However it may be hard to implement, given the divergent standards and aims of software and data in the web. The task is to integrate resources that were developed for all sorts of things, but certainly not for an easy reuse in some mashup. For good reasons, mashup developers are strong partisans of web standards.
Clashes and incompatibilities are lurking on many places. Figure 1 displays a mashup construction scheme organized in layers. It illustrates the many entities

that must be integrated (more detail on mashup construction in [6], [2]).
Please note that user roles are missing in the figure. But they are important. Mashups serve strong user roles and flexible web services. Users putting together their mashups with the help of mashup editors can combine resources so that they serve their individual needs.

3 Good old pioneering mashups

From the start-up period till today geo mashups are very popular. They appear as maps showing where local businesses and other establishments are located, often with their photos and address data or with widgets, depending on the purpose of the map. Today geo mashups cover most of the world. On figure 2 you see an example: the Google map of my home. The classical Chicago Crime Map[3] displays thefts, shootings and so on. Street views and car navigation services are popular for good reasons: they really help users in everyday life.

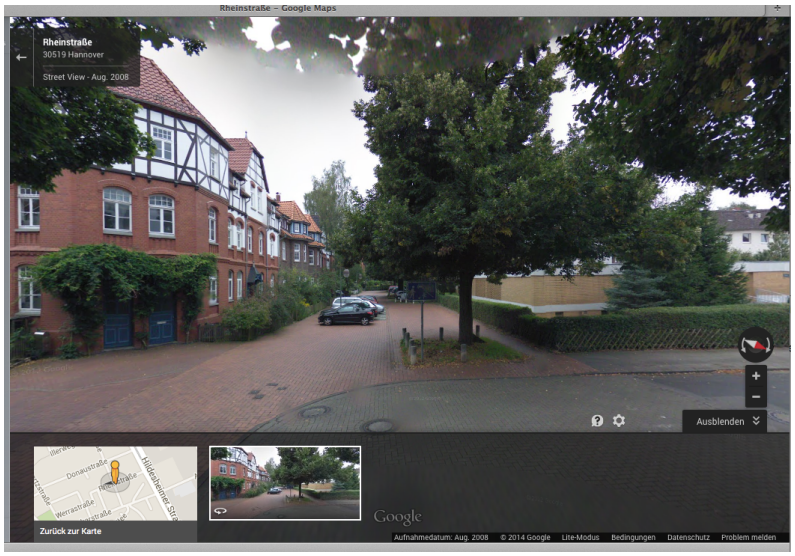

Fig. 2: A Google street view integrating map, photo, compass and more

4 Probing some mixed-input mixed-interface items

The web keeps accumulating data, media and additional resource types, such as software services (SaaS – Software as a Service) or specific networks such as

[3] `http://spotcrime.com/il/chicago`

LOD (Linked Open Data). Preferring them to own items often is a question of mere practicality. In other cases third-party resources are an enabling condition of an application.
Furthermore the web is entering deeper and deeper into our everyday life. Mashups and related mixed-mode systems do as everybody does - they populate fresh virgin soil of the web. They go mobile, they become ubiquitous, they are reaching new user groups and they conquer new substrates, for instance with sensors sitting on wearables like a jacket or an iWatch.
Let us inspect some application areas for probing mashups and more in general applications integrating several input resources and having possibly a few interfaces. Moreover we have to be attentive to the networks that may come up. We assume that the choice of domains does not really matter - one might obtain the same overall impression from other fields.

4.1 Audio and tactile

SubPac[4] accepts music from a mixer or a sound file. Music can be seen as a couple of tracks, or of frequencies, as an ensemble of voice, violin etc., so that one can consider it as a set of inputs as well. The SubPac service isolates the low frequency bass and renders it to users as a rhythm felt by the touch sense as in a discotheque under full sound. The physical interface is a sort of cushion or backpack. With it the listener can hear and feel the music. By converting sound to touch SubPac is rendering its users an interesting service. It delivers a tactile interface.

4.2 Virtual patients in e-learning

When a physician examines a patient she collects all sorts of details, from the prehistory of the patient to recent items, e.g. MRT (magnetic resonance tomography) images or lab findings. Figure 3 gives you an idea. The doctor follows pre-established rules. The situation is complex enough for training physicians (as pilots) in a (flight) simulator environment. A popular US offer is MedSims[5]. InMedea[6] distributes a simulator developed in Germany. There are more approaches on the market [1].
Imagine connecting all the data for the virtual test patients, in addition all the items the physician will provide while dealing with the patient, and the all-embracing clinical setting. As the simulator is dedicated to e-learning / physician training, there may be a tutor whom the doctor can ask and who assesses the work of the trainee.
Authoring a virtual patient test case implies the coordination of many information items. Intelligent integration and display of media clearly is a main task, but probably the author will perform well without even knowing the concept of mashups.

[4] http://www.thesubpac.com
[5] `http://www.medsims.com`
[6] `http://www.inmedea-simulator.net/med/scene/entry?`

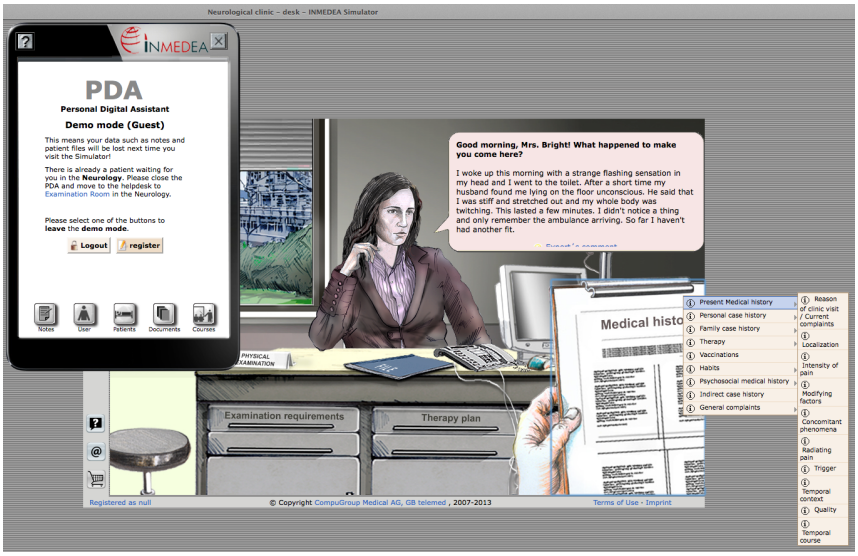

Fig. 3: A physician examining a virtual patient – InMedea example

4.3 Intelligent cars

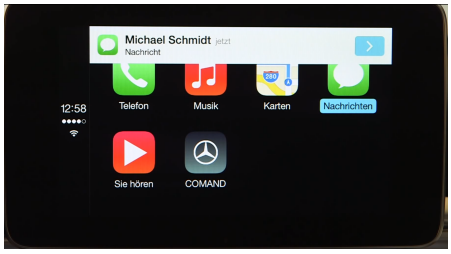

Fig. 4: iPhone on a Mercedes car display

Internet services are entering the cars of almost all manufacturers. Apple Car Play inside a Mercedes car[7] of today (figure 4) displays mobile multimedia information from an iPhone on the car network, with Siri speech processing included. The VW intelligent car vision[8] on figure 5 receives and processes an impressive quantity of information channels. Its service is to be autonomous driving.

[7] https://www.youtube.com/watch?v=SMX741OTOgg&feature=youtu.be
[8] https://www.itu.int/dms_pub/itu-t/oth/06/1B/T061B0000020056PDFE.pdf

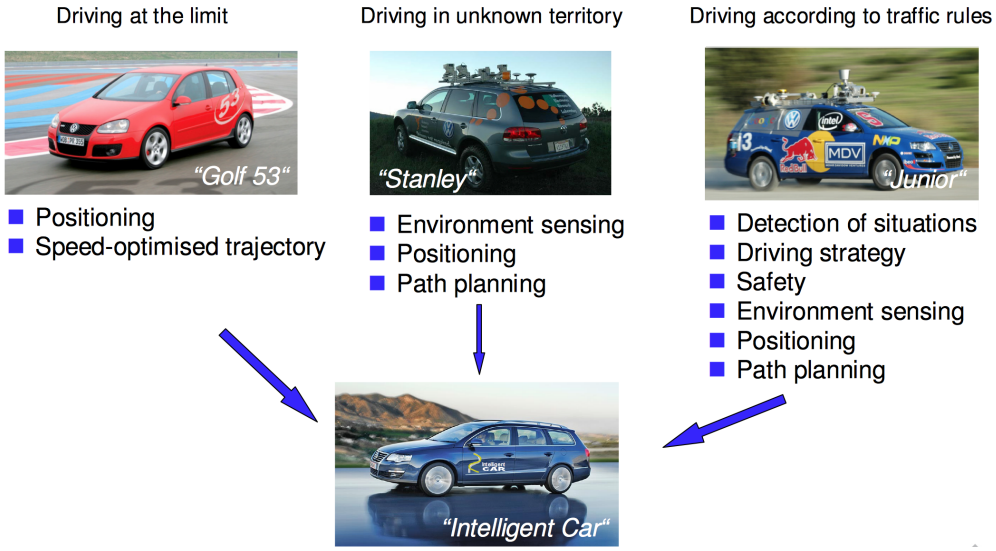

Fig. 5: Intelligent VW car vision

4.4 Bionics networks

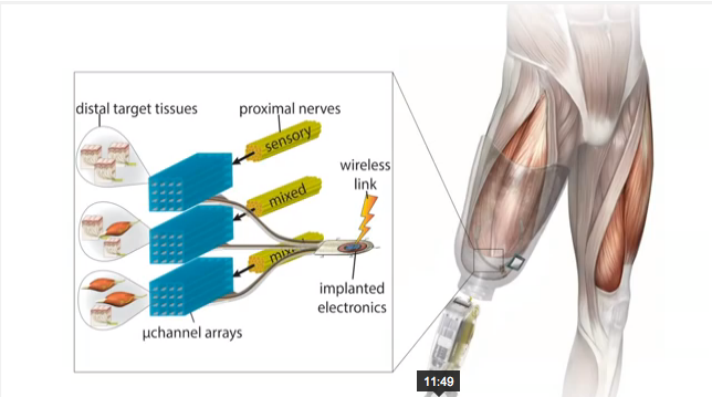

Fig. 6: Linking between body and exoskeleton

Nobody doubts that humans and things are legitimate participants of mashups and the like. Why should parts of humans and things remain out while humans and things are in? Please consider an artificial limb[9] on figure 6: The service is that a person can walk. Several stimuli from the body network come in via

[9] https://www.youtube.com/watch?v=CDsNZJTWw0w

different pathways. Some software with cognitive foundation is at work and a wireless link as well. If we want highly productive resource mixes - should they not include exoskeletons and other applications we did not imagine before? And by the way, where is the interface?

5 Conclusion

The skilled reuse of resources is a main impulse of the mashup concept, often seen together with adaptive services and interfaces for users. It is widely adopted today. As everyday things, networked things / resources have affordances that lie in the eyes of the beholder. They can be applied to unforeseen purposes. Networking enables this reuse.
The web made all sorts of resources available for further use: APIs, databases, ontologies, software services, cloud storage and so on. This was a signal for setting up mashups. Other networks, e.g. more local or restricted ones may offer to mixed-resources applications all items they need, too.
The inputs and interfaces of mixed-resources applications play on all available channels: graphic, audio, tactile, interactive, operative, mixed, etc. One may even ask whether a palpable interface must exist at all and which functions it should keep. It may reduce to a start button in an intelligent car.
The conclusion is evident: Let us replace the mashup concept which was good in the beginnings of the web with a new version that concentrates on the intelligent remix of resources on networks. No preset limits – let us challenge researchers to explore how far they can go.

References

1. Delgado Lopez Paula (2013).Virtual Patient. 1-6 in Martinez et al ed. AITA 2013, Workshop on Ambient Intelligence for Telemedicine and Automotive
2. Endres-Niggemeyer Brigitte (2013). Semantic Mashups. Intelligent Reuse of Web Resources. Springer Heidelberg
3. Fichtner Darlene (2009) What Is a Mashup? 3-17 in Engard Nicole C. ed. Library Mashups: Exploring New Ways to Deliver Library Data. BooksInfoToday 2009. http://books.infotoday.com/books/Engard/Engard-Sample-Chapter.pdf
4. Malki Abdelhamid & Benslimane Sidi Mohammed (2012). Building Semantic Mashup. Proceedings ICWIT 2012, 40-49. http://ceur-ws.org/Vol-867/Paper5.pdf
5. Martinez Natividad, Seepold Ralf & Ortega Juan Antonio ed. AITA 2013, Workshop on Ambient Intelligence for Telemedicine and Automotive / ISBN: 978-84-697-0147-8 http://madeirasic.us.es/aita2013/wp-content/uploads/2014/04/actas_web.pdf
6. Yu Jin, Benatallah Boualem, Casati Fabio & Daniel Florian (2008) Understanding Mashup Development. IEEE Internet Computing Sept/Oct 2008, 44-52