

# **Interstitia: A personal interface for information mash-up**

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This is a Big Idea piece for a collective intelligence book project by the New Era Office Research Center, Tokyo. It is written at the invitation of FX colleague Koushi Kawamoto. The project asks the same questions of 100 specialists:

Answer these four questions about an idea for a next-generation workplace:

1. Want: what do I want to be able to do?
2. Should: what should a system to support this "want" be able to do?
3. Create: imagine what an instance of this idea might be.
4. Can: how could this instance be realized in reality?

## **1. Want: Mashup**

In my ideal work environment, the data I need on everything and everyone should be available at my fingertips, all the time, in many configurations that I can mix-and-match to suit the needs of any task. This includes things like:

- documents of all types
- people's status, tasks, and availability
- audio, video, mobile, and virtual world communication channels
- links to the physical world as appropriate, for example sensors delivering factory data, or the state of the machines I use daily in the workplace (printers, my PC, conference room systems), or awareness data about my colleagues.

## **2. Should: Interstitia**

A support structure for mashup must include a robust, massively interconnected physical, mobile, and virtual system with audio, video, sensor, and network support. The term "interstitia" refers to the interconnecting fibers of the human body. My interstitial should reach beyond my skin into my world.

## **3. Create: Instrument**

One problem with mashups is that too much data can be hard to understand: as the saying goes, you can't see the forest because the trees are in the way. What is needed is a Data Instrument: a system that allows a person to "perform" with structured data as efficiently as a musical instrument allows a person to "perform" music. Just as a musician uses a physical device and a large body of structured virtual information to perform music, so can someone in the Interstitial Office use new technologies to work with a large set of mash-up data.

#### **4. Can:**

How can we approach this problem? Let's consider the creation of a personal interface or instrument for information mashup, capable of interacting with complex data structures, for tuning smart environments, and for exploring worlds both physical and virtual, in business, social and personal realms. Like any interactive system this idea has two parts: human-facing and system-facing. Let's call them Interstitia I (extending human interactivity) and Interstitia II (enabling smart environments).

##### **Interstitia I: Extending human interactivity**

What happens when we combine the power of real-time interaction with complex document collections, data sets and knowledge structures? By avoiding the click-and-wait response mode of Web sites in favor of real-time interaction one gets a much more visceral sense of the patterns that exist in the data.

By making that interaction non-trivial, for example, by allowing several simultaneous controls or modes to operate at once, the data-interaction instrument becomes an extension of the human sensory/sensibility system. As humans we are used to dealing with many signals arriving at once from various nerves and sensory organs. Why shouldn't our interfaces take advantage of this human capacity?

Imagine a new type of technology for interacting with the increasingly intelligent environments around us. This technology is designed to enhance both connectivity and comprehension, and to allow complex interaction styles suited to a new generation – a generation raised on the immersive environments and multi-channel interfaces of computer game worlds as well as the always-on connectivity of 3G cellphones and the smart Web.

The simplicity of the interfaces used to introduce computers to society are no longer necessary. Instead, we can have interfaces that grow with us, that we can learn to use as experts over decades. In this case, expert use design creates an instrument for manipulating data in meaningful ways, an instrument with built-in computation that interacts with the surrounding environment. This imagined new interface technology becomes our external interstitia: an information prosthetic for deeply interconnecting us with the information sources all around us.

This leads to the next piece necessary in this new technology: smart environments and systems to support them.

## **Interstitia II: Enabling smart “mashup” environments for the workplace**

Many designs for the next generation of workplace environments are informed by the most recent research in rich media, context-aware mobile systems, ubiquitous displays, and interactive physical environments. But many questions remain: How should workplace systems reflect the rapidly changing expectations around personal devices, smart physical environments, and social online spaces like Facebook, Twitter, and Second Life? What kinds of systems are needed to support work in technologically complex environments? How can design of workplace spaces and technologies account for differing social and cultural practices? What requirements are imposed by security and privacy issues in public spaces?

Online virtual worlds (e.g. Second Life, Gaia, OpenSim and There.com) are increasingly used in the business world for meetups both casual and formal: academic lectures, remote collaboration, and business meetings. A more secure virtual environment that imports everyday office documents, such as Qwaq Forums or Sun’s Wonderland, can be used for shared document editing, remote collaboration, teleconferencing in the virtual world, and linking real-world data into the virtual space for collaboration. These worlds are excellent candidates as mashup contributors; most of them allow at least some embedding of other media types, and interconnectivity with mobile and web applications. In addition, they are designed to be robust over time even with many users.

What about mobile media? Increasingly distributed work processes along with the ubiquity of mobile devices provide motivation and means for mobile meeting support. But what does it mean to be in a meeting while mobile? Mobile users face higher contextual demands on their attention and thus it may be difficult for them to maintain the level of awareness necessary to follow a meeting in real time. It can also be difficult for non-mobile participants to understand the context and personal state of a mobile user. However, systems should not merely make allowances for mobile participants but also allow them to contribute in ways non-mobile participants are not able to.

An "Interstitia II" smart environment is a cohesive framework for information mashup: interlinking physical devices and sensor networks with virtual and mobile environments, and allowing transparent flow of all kinds of media and documents. Wearing my personal information prosthetic, I should be able to walk into an Interstitia II "smart" meeting room and immediately, easily, join my preferred virtual world, while inviting several mobile participants to look at and edit three different document types and two live video streams with me. That's the kind of interstitial connection with both information and environment I look forward to in the workplace of the future.