



Relate Gateways

Spontaneous Mobile Interaction with Pervasive Services

One of the early visions of ubiquitous computing was to enable mobile users to spontaneously use available pervasive services. While current discovery mechanisms facilitate network-level connections, it remains quite difficult for users to identify available services then configure and consume them.

To enable spontaneous mobile interactions with pervasive services we propose the end-to-end discovery model (Figure 1) and its implementation in the RelateGateways Architecture, enabling the rapid prototyping of spontaneous environments.

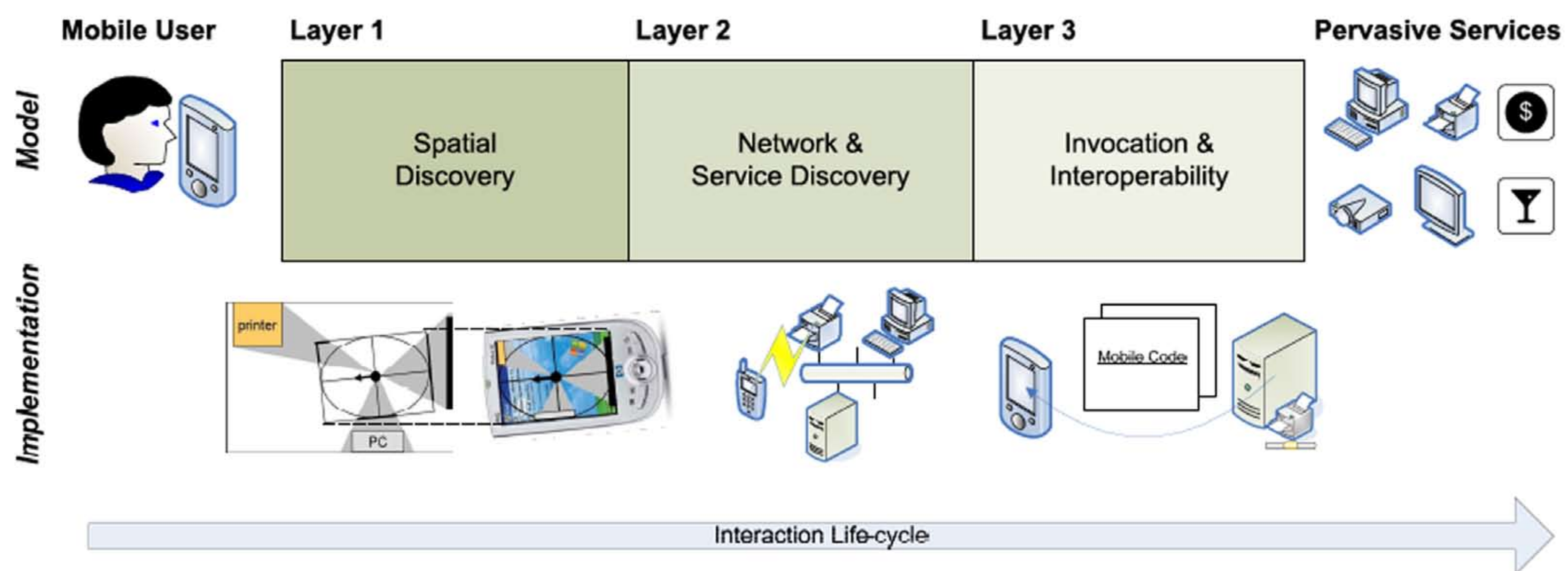


Figure 1: End to End Discovery Model

Layer 1 Gateways Compass UI

The RelateGateways user interface consumes real-time relative positioning information to help users find services by displaying interactive areas, called gateways (Figure 2).

As a user enters a new area, small widgets representing the available services appear at the screen periphery.

The position of the gateways is updated as the user moves. Thus, the interface is a compass, helping the user to identify available services in his immediate environment.



Figure 2: Gateways User Interface

Layer 2 Relate Dots

In order to feed the user interface with real-time positioning information (Layer 1, Figure 1) and enable dynamic network and service discovery (Layer 2, Figure 1) a sensor network is required.

We integrate the Relate ad-hoc sensor network to the RelateGateways architecture. For this purpose a Relate Dot (Figure 3) is attached to each service provider.

These autonomous sensors use both ultra-sound and radio-frequency technologies to create an ad-hoc network providing real-time relative positioning.

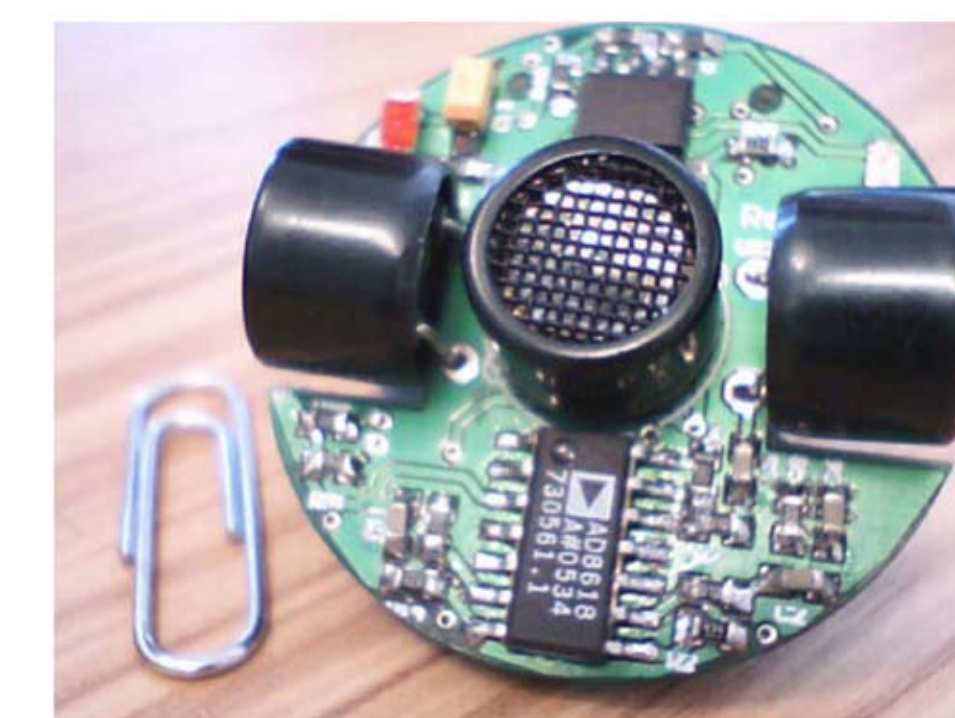


Figure 3: Relate Dot Prototype

Layer 3 Mobile Code

An interaction deserves to be called spontaneous if it occurs in a natural and unplanned manner. As a consequence the installation tasks for users should be reduced as much as possible.

We propose a service framework for interoperability based on the dynamic loading of mobile code which enables the newly discovered services to be accessible in a plug-and-play fashion (Figure 4).

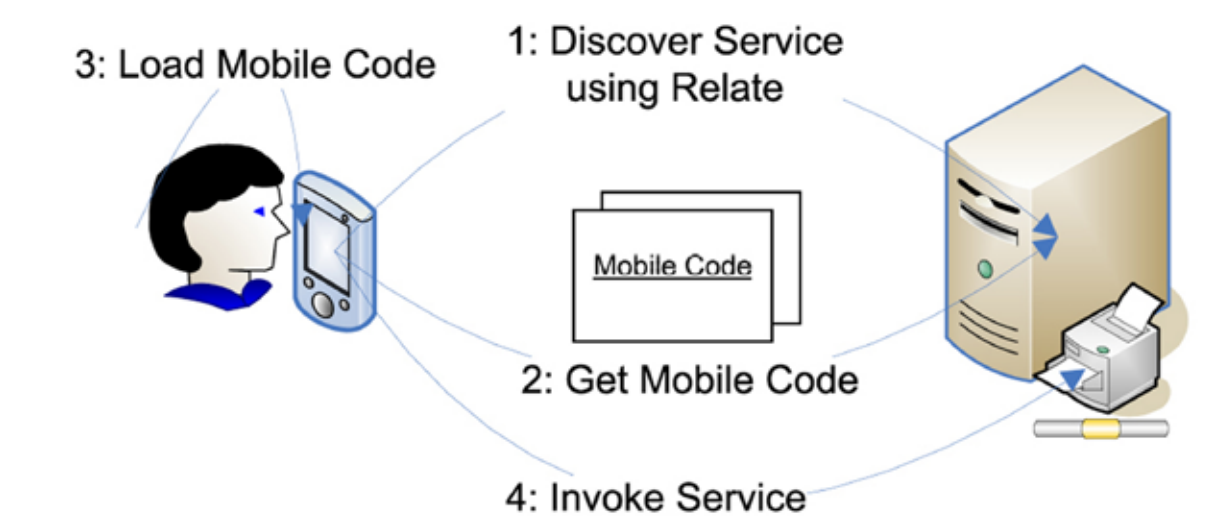


Figure 4: Plug 'n' Play Invocation



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RelateGateways' webpage:

<http://ubicomp.lancs.ac.uk/relategateways>

Relate project's webpage:

<http://ubicomp.lancs.ac.uk/relate>