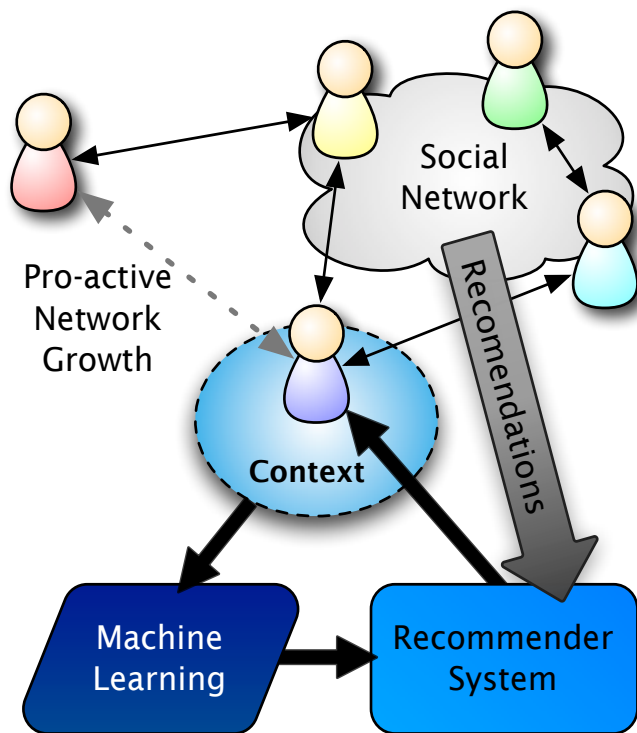


Instant Knowledge: Context Gatherer Brief

IK Concept

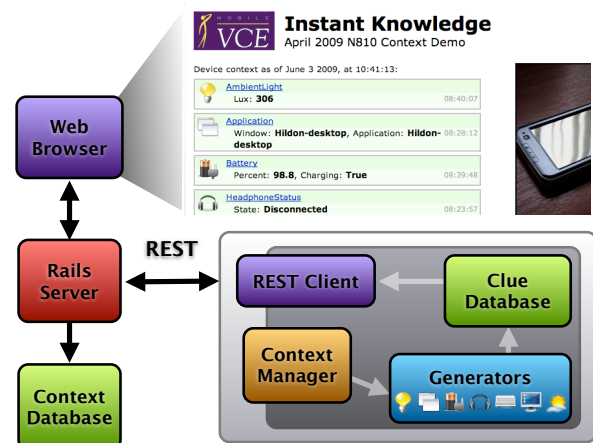
Instant Knowledge enhances the value of any organisation's most important asset—the information held by its employees. Rather than requiring staff to fill out skills profiles, which are very general, become outdated, and require significant effort, IK uses an application on employees' smart phones and laptops to gather information on what they are doing and who they are communicating with. This context is used to build dynamic skills profiles along with a social network map for the enterprise, which provides a resource to proactively offer recommendations to participants. Using IK, staff can always find the best person for the job.



IK Concept: It's not what you know, it's who you know, and who they know...

Context Gatherer Concept

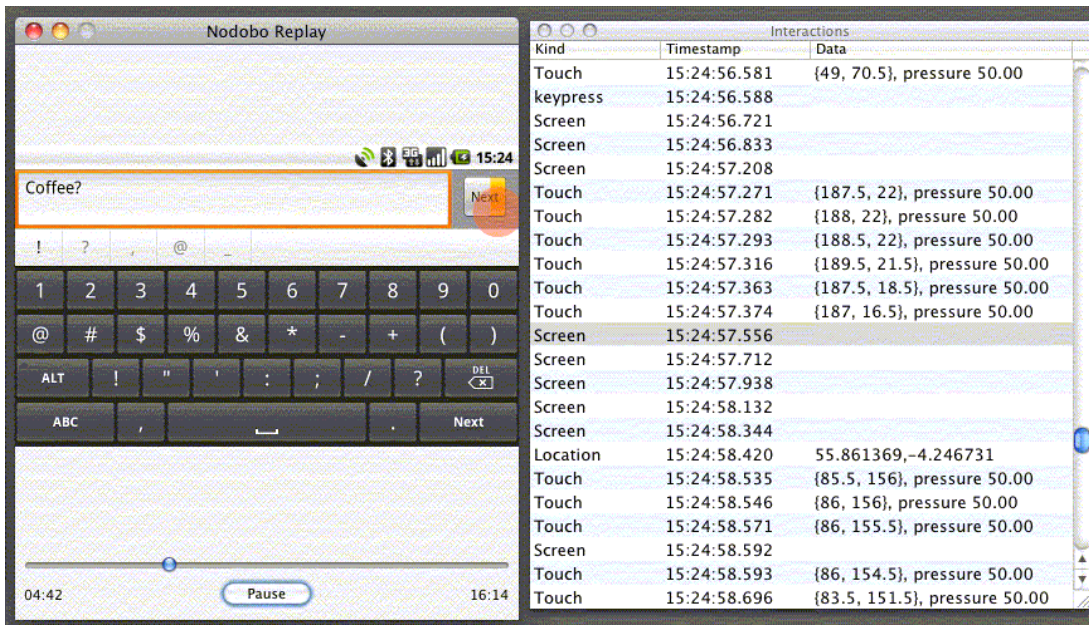
Context information is any measurable data which pertains to the state of a device. The temperature of the device, speed at which it is travelling, battery life, position, or details of the state of network interfaces are all examples of context data. The IK context gatherer shows how this data can be gathered by publishing changes in device context to a webpage in real-time, and combining them to make inferences about the actions of users.



Context gatherer overview.

Novelty & Contribution

Modern smart phones are very powerful devices with a large number of environment sensors, capable of sensing not just the radio environment (Cell ID, Wi-Fi SSID, etc), but also position (GPS), acceleration, orientation, direction, temperature, ambient light level, to name a few common examples. This environmental context, together with application context (the application in focus, whether a keyboard is enabled, time from last user input, etc), can provide clues about the state of the user (their activity, ability to receive calls and by what means).



The context gatherer has also been implemented in Android. This diagram shows the output of the context gatherer on the right, with the user interface capture tool also developed within IK on the left. The combination allow a complete recording of a user's experience.

The context gatherer developed within the Instant Knowledge project has a modular structure with a context manager controlling a number of context generators which each collect a specific piece of context. This highly flexible system is easily adapted to different hardware architectures and applications, and reduces the power consumption of the context gatherer. A clue database analyses the output of the context generators to infer the user's state.

Demonstration Results

The context gatherer demonstrator is live code as would form part of the IK system on the device. A functional diagram of the system is shown below. A context manager controls a number of context generatorsthis modular construction allows easy addition or exclusion of types of context. A clue database allows inference of the system context, and this is communicated to the IK server using a REST client. The system on the left of the diagram, implemented on the server, is adapted for the demonstrator to allow visibility of the context. The server places the context into a database as passes it to a web server where it can be displayed

Application Scenarios

The context gatherer is an enabler for a wide range of applications. Rich context can make the user experience more relevant and useful. Very simple applications include automatic adaptation of notification means for

incoming calls or messages, or status indicators for IM clients. Inference about state could be used to redirect enquiries, for example recommendations from the IK system, to those most likely to be in a position to answer them. Within the IK project, the context gatherer has been used to provide rich context to the user interface capture tool to enhance the recording of user interface experience.

Conclusions

Modern smart phones have highly advanced context measuring capabilities. The context gatherer developed in the IK project has demonstrated that it is possible to harvest and use this context without significantly affecting the phone's resources, either in terms of battery life or user responsiveness. The context can then be used to make inferences about the user's state either for applications on the phone, or for communication to other devices or an enterprise system.

Further Information

Videos and Technical Reports for all of the Instant Knowledge research outcomes are available to members on the Mobile VCE web site. For non-members the Instant Knowledge overview sheet is available at:

www.mobilevce.com/infosheets/InstantKnowledge.pdf

For further information and to register for information about future MVCE IK events please email Jerry Horton: jerry.horton@mobilevce.com