Extending App Inventor to Support Humanitarian-Focused Apps

Lalana Kagal

Massachusetts Institute of Technology

32 Vassar Street

Cambridge, MA

lkagal@csail.mit.edu

Smartphones are quickly becoming the primary computing and communication platform for people's daily tasks. With the rise of social networks, users frequently update their social profiles with their current activities and/or locations or, in case of crisis situations, their status and that of the crisis. Social signals from microblog platforms has been found to be especially useful in disaster management and relief operations. By integrating crowdsourced information with Geographic Information Systems (GIS) data or other open datasets released by the local government, some technical volunteers have developed useful mobile applications for disaster relief.

However, these applications usually create or consume data stored in standalone databases, or even worse, in spreadsheets. Moreover, the structure on the data is driven by manually crafted schemas as opposed to ontological structures supported by the community. Most of these applications are built in silos and are unable to exploit the potential of being integrated with other data collected from other organizations, or even the government. This means it is often difficult to get the entire picture of a crisis or provide sufficient information to citizens or decision makers. Also, the lack of expertise and the cost for building mobile applications can cause relief workers and organizations to turn to more manual steps for merging various reports from volunteers and other sources, which is widely practiced in current times. Consequently, the increasingly unorganized and scattered information becomes noise in the overall system that is aimed for providing timely situational awareness and can often slowdown the decision making process

In this talk, I will describe our framework, Punya, which enables non-technical application developers to quickly build and deploy humanitarian-focused mobile applications. These applications are able to advantage of key sources that are fundamental for today's networked citizens, including Twitter feeds, Facebook posts, current news releases, and government data. They also have the capability of empowering citizens involved in crisis situations to contribute via crowdsourcing, and to communicate upto- date information to others. We address the challenge of integrating data generated by multiple parties, including the "crowd", relief organizations, and government agencies by using Linked Data principles to enable the reuse, extension and integration of heterogeneous structured data from distributed sources. Linked

Data is a set of design principles proposed by the World Wide Web Consortium (W3C) for using Web technologies in order to support the distributed development of structured information such that it can be easily and automatically combined. We have extended the App Inventor platform with (i) Linked Data technologies, and (ii) supporting Web services. Our "Linked Data" components allow app developers to easily build applications that explore and consume Linked Data datasets as well as publish structured data directly to Linked Data repositories on the Web. Our supporting Web services allow App Inventor components to easily provide capabilities such as crowdsourcing, push notification to provide real-time updates to app users, and handling streaming data from sources such as Twitter.