

EE564 Course Project, Spring 2012

Smarter Communication: Informing the Status of Busy Places

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Introduction

Communication technology has become a popular approach for people to stay in touch, social-network, retrieve information, and consume streaming media. On a smarter planet, almost anything can become digitally aware, instrumented, and interconnected. However, the rich potential for communication technology and digital devices to implement new processes and to improve the quality of our living is far from being fully exploited. The course project will prepare software engineers to contribute to this Smarter Communication vision in the context of solving authentic, real-world problems based on the principles of Project-based Learning (PBL). PBL has been shown to produce positive outcomes related to student learning in the areas of content knowledge, collaborative skills, engagement and motivation, and critical thinking and problem-solving skills. Another potential learner benefit is that they will learn to use state-of-the-art software products, thus increasing their prospective employability.

Purpose and Scope

In public places such as university campuses, many people share common services such as dining and libraries. When there are long waiting lines and under-staffed stations, the quality of services can be suboptimal at best and even frustrating for the users. *The objective for the proposed course project is to use communication and information technology to streamline busy public processes and activities shared by many people.* One example is dining services on university campuses. For example, in the Student Center at Clarkson University, there are five lines serving five different kinds of food. During rush hours, people often have to wait in a long line for quite a while before they get served. In the proposed course project, students will use existing social networking applications and build mobile applications to create solutions for problems originating in such settings. For example, systems can be built to make information about the status of the line readily available on office computers and mobile devices in nearly real time (say updated every 10-15 minutes). In this way, other people can plan their dining activities proactively to avoid long lines. Moreover, using analytics software, managers can analyze the data collected during a long period to gain insights into how well their services and processes have been run. They can then improve the processes, for example, by dynamically scheduling staffs on an hourly basis.

The proposed project affords a rich design space where multiple design options exist for students to explore. So students can design a solution based on their constraints and preferences. Consider the problem of raising the awareness of line status. One way to gather this information would be to give the workers who serve each station a dedicated touch screen and ask them to type in the number of people waiting on their lines every 10 or 15 minutes; a shortcoming of this approach would be that it adds additional responsibility to an already busy worker. Another approach would be to create a dedicated mobile phone application that students and faculty can download and use to voluntarily help report the line status where they are waiting. Yet another solution would be for volunteers to tweet with a special format that can be detected and broadcast to other users by another program. More automatic but less intrusive approaches are also possible, for

example, by installing cameras and using Image Processing techniques to count the number of people waiting in a line.

A server will be needed to manage user registration and to collect data about lines. IBM WebSphere, or a cloud environment, and DB2 will be used to develop the server. The Cognos data analytics software will be used to analyze the collected data to gain business insights.

Proposed Modules

The following modules will be developed to prepare the students to work on the proposed project:

- Introduction to IBM WebSphere Application Servers
- Introduction to IBM DB2
- IBM Web 2.0 platform, including mashup technologies, RIA technologies, and related tools (<http://www-01.ibm.com/software/info/web20/mashups-rias/index.html>)
- Social networking applications and their APIs (Twitter, Facebook, Google gadgets)
- Mobile application development.