

Summary

In the enterprise, a common problem is to find a person and then to contact them using the most appropriate means. The person may be away from their computer or desk, in meetings, or travelling. Determining best means of contacting them is difficult without knowing their current availability and location status. Social networking tools such as Facebook [Facebook 2008] and Twitter [Twitter 2008] demonstrate that by providing a central location for status information that can be easily updated, near real-time status information about people can be maintained. The aim of project is to apply the idea of status updates to the enterprise. A proof of concept system is to be developed to store status updates, with intelligence to minimise the required data entry and also to determine the best means of communication (e.g. in person, phone, email, etc.). The system is targeted to support and make use of mobile device features (e.g. GPS, calendars, etc.).

1 Project Description

1.1 Background and Motivation

In an enterprise environment, a common problem is determining where a person is and the best means of contacting the person. For example, if the person is in the office then a face-to-face meeting may be appropriate. However if the person is in a meeting at a client site, then a less intrusive means of communication would be better (e.g. email).

Another aspect to this problem is that many users now have smartphones (e.g. iPhone, Blackberry). While these users may not have access to a computer (e.g. while travelling or between meetings), they would have access to some forms of communication. By providing accurate status information about these users, it is possible to facilitate phone conversations or other limited forms of communication, thereby allowing productive use of time.

There are tools such as emails, calendars and instant messaging tools that partially address the problem of providing up-to-date status information. However they have several issues such as:

1. Calendars are not often kept up to date, and do not always accurately reflect the duration of the meetings or a person's availability (e.g. a person may not be in a meeting, but may be busy and not interruptible).
2. Instant messaging tools typically only provide basic status information to identify whether someone is busy or idle. Also, it is a common occurrence for users to forget to update their status. In addition, instant messaging tools are typically used only on PCs and not mobile devices.
3. Emails and other 'word by mouth' status updates may be easily lost or not distributed.

Social networking tools such as Facebook and Twitter provide a central location for status information. By making status updates 'fun' and easy, these tools have demonstrated that useful near real-time status information can be maintained. This information could then be used by others to determine the best means of communication. It is the application of this principle to the enterprise that is the focus of this particular project.

1.2 Aims, Significance and Expected Outcomes

1.2.1 Project aims

The main aim is to develop a proof of concept system for recording and querying a person's current status. As part of querying a person's current status, the system would identify the best means of communication at a particular point in time. The proof of concept could serve as the basis of a pilot in an organisation to determine the effectiveness of this particular application.

The key requirements of the system are:

- Minimal data entry to update a person's status. While users are expected to have a basic understanding of computers including use of email and the Internet, they would be time constrained. Therefore the interface must be quick and easy to use, and the system should have built-in intelligence to make use of electronically available inputs (e.g. calendar entries, GPS location)
- Support maintenance of status on mobile devices. The main benefits of the system would be achieved for mobile users.
- Support querying of a person's status and recommend a suitable means of communication.

One approach to making status updates quick would be to use a rules/reasoning engine to determine the correct status. For example, based on a user's inputs from their calendar, current location and time of day, the rules/reasoning engine may be able to generate the following statuses:

- John is in a meeting at Client X until 4:30pm
- John is working from home.
- John is free until 12:30pm.
- John is in transit.
- It is after hours where John is

Based on the status, the rules may also be extended to allow other users to query the system to determine the best way to communicate with the user (e.g. phone call, email, message, message on a noticeboard).

Investigation into the use of a rules/reasoning engine is a key aspect of this project.

Development of a suitable data entry interface would also be required, and would be addressed as part of this project. In addition, the system is to support mobile devices either through a prototype client application or at least via extensible system architecture.

1.2.2 Significance

Enterprises are typically conservative, and the use of state of the art technologies such as social networking tools and rules/reasoning engines are typically limited. The deliverables out of this project can be used as an input into a pilot program in an enterprise to evaluate the productivity improvements of using these technologies as well as to work through deployment issues. This could encourage further development and use of social networking tools in the enterprise.

Also, the intelligence of current status tracking tools such as instant messaging and websites such as Facebook are either limited or rely heavily of human interpretation. The prototype developed as part of this project could serve as a concrete example of how rules/reasoning can be applied to extend these existing tools.

1.2.3 Expected Outcomes

The expected outcomes of this project are:

- 1) Proof of concept system comprising of the following components:
 - a. Server application that stores statuses with a rules/reasoning engine.
 - b. Client application allowing entry of a person's status. This may be extended to allow querying of other's statuses if time permits, and an application deployable to specific mobile devices.
- 2) Report documenting:
 - a. Literature review, requirements analysis and decisions on technology selection.
 - b. Analysis and design of the system including use case analysis, sequence diagrams etc.

- c. Discussion of issues with the system, and potential issues that may need to be resolved as part of deployment or future work.
- d. Additional enhancements that may be implemented.

2 Research Methodology and Plan

2.1 Approach

This project primarily consists of software development, with an initial investigation to finalise the scope. The project will run over two semesters, covering units ITEC808 and ITEC809. In order to fit into ITEC808/809 unit split constraints, the project will run in two phases:

- Phase 1: Feasibility study and development project scoping. This will be the main focus during ITEC808. It is an analysis phase to determine requirements for the system, to select appropriate technologies and to document specific issues that may need to be addressed as part of development and deployment of the system. The scope of development iterations for phase 2 would also be determined.
- Phase 2: Software development. This will be the focus during ITEC809. A mix of waterfall and iterative development will be used [Sommerville 2007, Ch 4]. High level analysis and design would be conducted initially to provide an overarching architecture and approach first. This would then feed into iterations consisting of detailed analysis, design and development work for specific requirements. Analysis and design would include use case analysis, sequence diagram documentation and necessary design decisions. This iterative approach will allow core components of the project to be completed first for submission, with potential for additional development work to be performed if time permits.

2.2 Task Plan

A detailed Gantt chart covering both ITEC808 and ITEC809 can be found in Appendix A. Deliverables from these subjects are marked as milestones. Note that milestones and tasks for ITEC809 are tentative at this stage. The duration for subtasks represents the effort required, whereas the duration of high level tasks and the dates for each subtask represent elapsed time. 10 hours per week is allocated for the entire duration of the project.

2.2.1 Phase 1 - Literature review (3 days, 12 hours effort)

This task consists of reviewing literature on:

- Existing social networking tools and research papers related to this project. This would allow requirements to be fine-tuned and finalised to target specific features not currently available in other tools.
- Documentation about mobile device capabilities. This would be done to understand user interface and integration issues that may need to be addressed (e.g. small form factor, available software libraries, processing power, etc.)
- Research papers and documentation about rules and reasoning engines. This would support the evaluation and selection of an appropriate rules/reasoning engine and data store for the prototype.

The aim of this task is to support the 'Review of sources' deliverable.

2.2.2 Phase 1 – Application Requirements Analysis (7 days, 16 hours effort)

Based on the literature review, additional analysis may be required. For example, details on information to include in status updates may need to be determined to support technology selection. Also, requirements may be refined based on review of other similar systems. These will be performed as part of this task.

At this point, any potential deployment issues will also be documented as part of the project report deliverable for this phase. These may include privacy issues, network access requirements, and data security requirements.

The outcomes of this task feed into ‘Technology Selection’ and ‘Development Work Scoping for ITEC809’ tasks (see below) and ITEC808 project report and workshop deliverables.

2.2.3 Phase 1 - Technology Selection (7 days, 16 hours effort)

This task consists of selecting appropriate technology to be used in the proof of concept. This includes answering the fundamental question of whether a sophisticated rules/reasoning engine would be required, and then conducting an evaluation on various technologies to select a suitable engine and corresponding data store (e.g. relational database or other logic store). Selection of a target mobile platform for the proof of concept would also be done at this stage based on device capabilities and availability of development resources (e.g. emulators, test devices).

Initial analysis work done as part of the Application Requirements Analysis task would be an important input for this task.

The outcomes of this task feed into the ITEC808 project report and workshop deliverables.

2.2.4 Phase 1 - Development Work Scoping for ITEC809 (5 days, 8 hours effort)

This task relates to finalising the scope of development work, including identifying the functionality to be developed in each iteration. The outcomes of this task would be documented in the ITEC808 project report and presented at the ITEC808 workshop.

2.2.5 Phase 2 – System Analysis (12 days, 24 hours effort)

This is a high level analysis including identifying necessary use cases for each iteration and initial use case and scenario documentation.

2.2.6 Phase 2 – High Level System Design (12 days, 24 hours effort)

The aim of this task is to determine a suitable application/system architecture and document the approach and design patterns to use. For example,

2.2.7 Phase 2 – Iterations (varying duration and effort – to be confirmed)

Currently four iterations have been planned for tentatively. The number and scope of each iteration will be finalised as part of ‘Phase 1 – Development Work Scoping for ITEC809’. Each iteration would extend the high level analysis and design conducted in the previous two phase 2 tasks with detailed design decisions, followed by software development.

The four iterations identified at this point in time are:

1. Server core (estimated 36 days, 80 hours) – This consists of developing the core server component, including the data model and any business services.
2. UI core (estimated 18 days, 40 hours) – This consists of developing web pages to support manual entry and querying of status tracking information.

3. Mobile UI basic (estimated 18 days, 40 hours) – This consists of developing an application on the selected mobile platform from phase 1 to support manual entry and querying of status tracking information.
4. Mobile UI enhanced (estimated 18 days, 40 hours) – This consists of enhancing the mobile application to support automated capture of some status tracking information (e.g. via integration with calendars and GPS functionality).

3 References

Some material that was used during the development of this proposal includes:

Facebook, <http://www.facebook.com/>, Accessed 7/3/2009

Twitter, <http://twitter.com/>, Accessed 7/3/2009

Social Network Service, Wikipedia, http://en.wikipedia.org/wiki/Social_networking, Accessed 7/3/2009

iPhone Application Programming Guide,
http://developer.apple.com/iphone/library/documentation/iPhone/Conceptual/iPhoneOSProgrammingGuide/Introduction/chapter_1_section_1.html, Accessed 7/3/2009

JBoss Drools, <http://www.jboss.org/drools/>, Accessed 7/3/2009

Sommerville, I [2007] *Software Engineering 8th Edition*, Addison-Wesley, Harlow, England.
Ch. 4 Software processes

Appendix A – Gantt Chart covering ITEC808 and ITEC809

