TERM PROJECT DESCRIPTION
IE 419/519: WIRELESS NETWORKS
WINTER 2013

OVERVIEW

In partial fulfillment of the requirements of this course, students will be required to complete a team-based project that focuses on the design and implementation of a wireless data collection system. To complete this assignment, project teams composed of a minimum of 2 students (or a maximum of 3) will be defined by the instructor based on the following criteria:

1. Class level (i.e., undergraduate or graduate).
2. Previous coursework taken that will facilitate the successful completion of the project.

OBJECTIVE

The primary objective of the term project is to provide hands-on experience on the design and implementation of a wireless data collection system. It is also expected that this assignment will enhance the students’ ability to document and communicate technical information in a professional, structured, timely, and effective manner.

REQUIREMENTS

As a first step, project teams will identify candidate processes for wireless automation within an application domain. Examples of application domains include (but are not limited to) manufacturing, health care, retail, education, and transportation. Project teams will be required to develop a wireless data collection system that supports at least two sequential processes within the selected application domain. The wireless data collection system developed must include at least the components depicted in Figure 1.

![Figure 1. Wireless Data Collection System Architecture.](image-url)

1. **Client Application.** A client application must be developed to collect data via a wireless bar code scanner. The development tool to be used for this system component is Wavelink Studio COM.
2. **Database system.** A relational database system must be developed to store the data collected by the client application running on the wireless bar code scanner. The database system must be capable of producing at least one report per process based on the stored data. The database system must be developed in MS Access.
3. **Graphical User Interface.** A graphical user interface (GUI) must be developed to allow a user to view and manipulate the data stored in the database. For example, the GUI should allow a user to enter information into the database other than that collected with the wireless bar code scanner. The GUI can be developed directly in MS Access or in a visual programming language such as Visual Basic or Visual C++.

**DELIVERABLES AND GRADING**

1. **Project Proposal (10 pts).** Each project team must submit a project proposal on Tuesday, January 22nd. This document (not to exceed 3 pages) should include the following information:
   - Project title
   - Team members’ names and roles (e.g., database designer, client app developer, etc.)
   - Description of the specific application domain and identification of processes for which the wireless data collection system will be developed. Make sure to include the following information in this section of the proposal:
     - Justification for selecting this application domain
     - Description of the “as-is” processes
     - Description of the “to be” processes
   - Tentative project plan (i.e., Gantt chart)
   - Any applicable references

   The project proposal will be evaluated on the basis of originality, writing style, and completeness. The decision as to whether the proposal is approved, needs revisions, or is rejected, will be made known to teams on Thursday, January 24th. **Feel free to discuss any ideas with me as you begin to formulate your proposal.**

2. **Weekly Status Report (10 pts).** Every Tuesday, starting the week of January 28th, teams must send the instructor (via email) a PowerPoint-based weekly status report by close of business (i.e., 5 PM). The status report should include the following:
   - Slide 1: Project accomplishments to-date
   - Slide 2: Issues and plan to resolve them
   - Slide 3: Plan for the following week
   - Slide 4: Updated project schedule

   Teams will present their progress to the instructor and the rest of the class. It is expected that different team members will rotate the responsibility of preparing and presenting the weekly status report.

3. **Final Written Report (20 pts).** Each project team must submit a final written report on Thursday, March 14th. This document should be typewritten, double-spaced, use 1-inch margins, and use 12-point Arial font. The following is a list of suggested sections that could be used to organize the final written report:
   - Executive summary (no more than one page long)
   - Table of contents
   - List of figures
   - List of tables (if applicable)
   - Introduction
   - Application domain description. The information presented in the project proposal could be used as a starting point to prepare this section of the final report. However, it is expected that the final report will include much more detail particularly with respect to the description of the “as-is” and “to-be” processes.
     - Justification for selecting this application domain
• Description of “as-is” processes
• Description of “to be” processes
• Description of the wireless solution developed
  ▪ Brief description of the hardware components used (i.e., access point and wireless bar code scanner)
  ▪ Database management system
  ▪ Graphical user interface
  ▪ Client application
• Conclusions
  ▪ Include an estimate of the expected impact on this environment (e.g., productivity improvements, cost savings) due to the implementation of the wireless data collection system
• References
• Appendices
  ▪ Wireless solution documentation (how every hardware and software component is configured) – **THIS IS A CRITICAL COMPONENT OF THE FINAL WRITTEN REPORT!!**
  ▪ GUI screen capture images
  ▪ Client application data collection screens
  ▪ Modeling diagrams (i.e., E-R diagrams, flowcharts, value stream analysis)
  ▪ Database reports
  ▪ Code listing

4. **Final Presentation (20 pts).** All teams will give a 15-minute final presentation on **Thursday, March 14th**, to share the results of their project.

5. **Project Demo (20 pts).** Each team should make arrangements to demonstrate their wireless data collection solution to the instructor during **dead week** (**March 11th – March 15th**).

6. **Peer Evaluation (20 pts).** A peer evaluation form will be provided to each student at the end of the term. The results of this evaluation will be applied to each individual student to determine his/her final grade for the term project.

7. **Project documentation CD (40 pts).** All teams must submit a CD (properly labeled) containing a complete set of term project documents on **Wednesday, March 20th** (final examination date). This CD must include at least the following documents stored in separate and easily identifiable subdirectories:
   a. Final version of project proposal.
   b. PowerPoint-based weekly status reports.
   c. Final written report.
   d. Final PowerPoint presentation file.
   e. MS Access database.
   f. VB .NET or C++ source code files.