PROJECT REQUIREMENTS & SPECIFICATIONS

1.	Project Title
	LEEFT³ – Lift (Elevator) Environment Forged Tenderly by the Team of Timisoara

2.	Project Assignment
	"Politehnica" University of Timisoara Team: - Victor Tomescu - Mihai Zilahi – Stoiculescu - Mihai Martalogu - Zoltan Lorincz

3.	Project Objectives
	This project has 3 main goals: - To implement the control of an elevator using a "pure" hardware solution. The control algorithm will be implemented on the PIC microcontroller, the drive motor, the cage and floor buttons will be also implemented in hardware. However some actuators and indicators signals will be interpreted and displayed on the computer display. - To implement a GUI driven simulation of the system described above. - To implement a third solution for the elevator system. This solution will implement some new characteristics like multiple lift shafts controlled by a central dispatcher. It will be a hybrid solution consisting of simulating two elevators: one will be a GUI driven simulation, the other will be implemented in hardware.

4.	Project Characteristics/Description
	4.1 Project 1 – Hardware
	This solution will implement only one lift shaft. The shaft will have 4 floors: ground floor and three others. Each floor will have:
	- Two buttons used for calling the elevator for going up or down; - Sensors used to detect the presence of the cage;
	The cage of the elevator will contain a 7 segments display showing the current floor number. The cage buttons will be implemented using a 12 contacts keypad. A system will be implemented for the detection of the presence of the passenger inside the cage.
	A scale model of an elevator will be built using a DC motor. The motor will be controlled by the hardware board according to the commands received from the keypad and the floor buttons based on a planning algorithm developed for the PIC microcontroller.

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The simplified model of the algorithm being used is presented at the end of this document in Figure 1: Algorithm Flowchart.

4.2 Project 2 – Software

This solution is similar to the solution presented above with respect to the algorithms used, but it is a GUI driven simulation. This means that all the actuators, indicators, buttons, sensors, 4 floors and the cage will be simulated inside an environment developed in Visual C++ 6.0.

A difference from the previous solution will be the vocal announcements that the passengers will hear inside the cage.

The demo for this solution will be developed in a client / server manner. There will be a server that will implement the shaft and the cage. The clients will implement the individual floors.

4.3 Project 3 – Hybrid

This solution introduces the idea of multiple elevator shafts. Only two shafts will be implemented: one will be implemented in hardware, the other one will be simulated on a computer.

The whole system will be controlled from a centralized location that will be called a dispatcher. This dispatcher will receive the messages from both shafts' individual controllers, and based on a special planning algorithm will send back the necessary commands.

5.	Project Deliverables

5.1 Project 1 – Hardware
- Controller board;
- Working elevator scale model;

5.2 Project 2 – Software
- Commented source code for the server application;
- Server application;
- Commented source code for the client application;
- Client application;
- Demo application;

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5.3 Project 3 – Hybrid
- Commented source code for the dispatcher application;
- Dispatcher application;
- Commented source code for the simulated elevator shaft application;
- Elevator shaft simulation;
- Working elevator scale model;
- Controller board for the hardware shaft;

5.4 Other deliverables:
- Design outline;
- Interim report;
- Final report;
- PowerPoint presentation;

6.	Project Milestones

- Tuesday
  - o completion of the design for all the three solutions;
  - o outline design document;
- Wednesday – solution 1 and 2 completed, model elevator built;
- Thursday
  - o hybrid solution completed,
  - o interim report document;
- Friday
  - o testing of the projects, unexpected situations;
  - o final report document;
  - o PowerPoint presentation;

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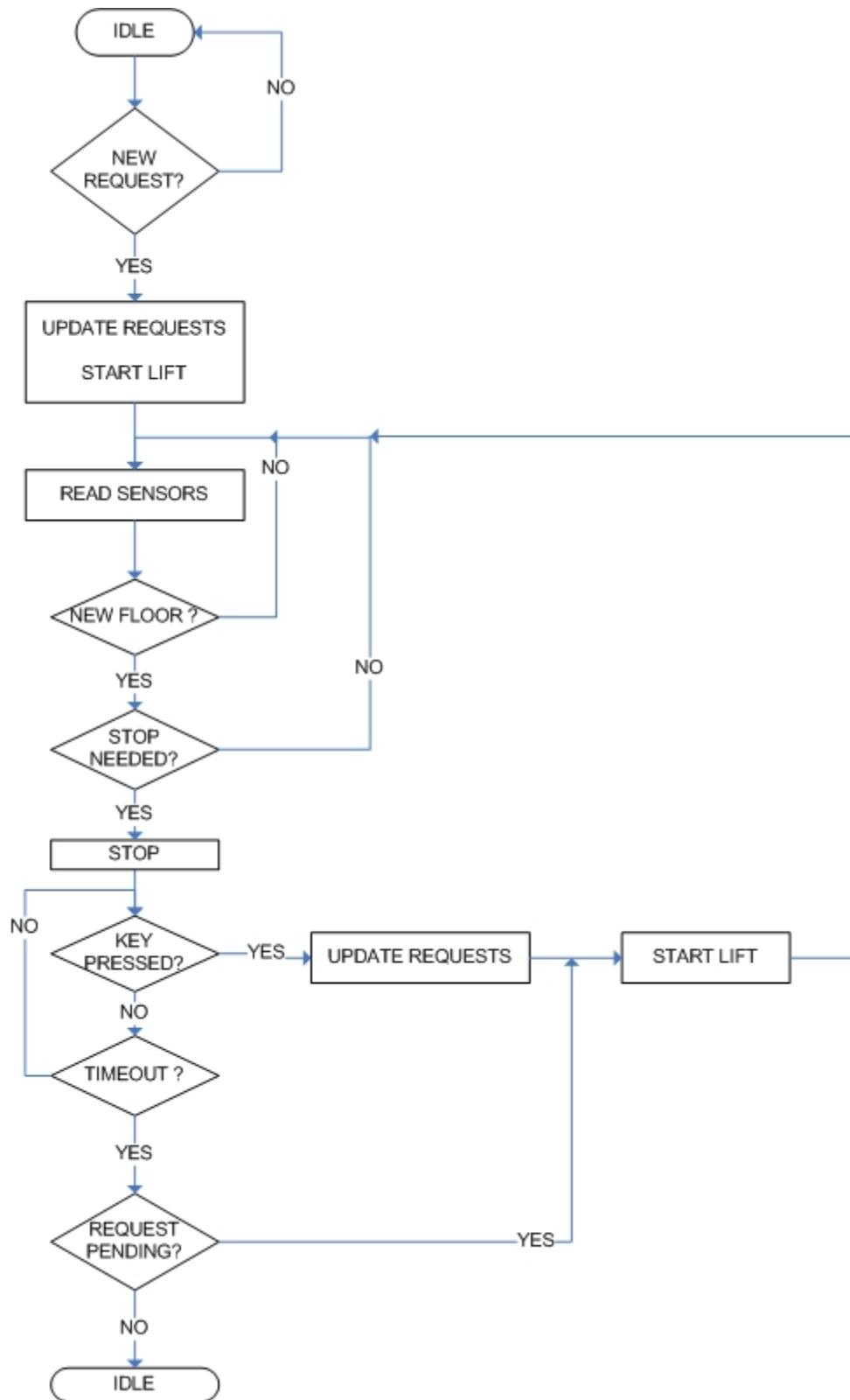Tel: +40 256 403271, Fax: + 40 256 403214
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Figure 1: Algorithm flowchart