

User Interface and Embedded System Technical Report

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Chapter 1

Introduction

This report covers the research, design, analysis, and prototyping of the team 2 Automated Bike Rental Station (ABRS). In particular, the report discusses the initial requirements and expectations, the research to investigate the initial criteria, the analysis of the proposed model, and the prototyping of the proposal involving the embedded system and user interface of the project.

Chapter 2

Initial Requirements

The initial requirements were set forth in the form of a system from which customers can rent bicycles. The purpose of this product is to enrich the communication and relationship between York College and its surrounding community. To facilitate this project, certain major specifications are required from the ABRS system. The bike rack must be able to operate year-round, customers return bikes to the same stations from which they were rented, and the ABRS must be able to sufficiently power itself when a grid connection is unavailable. These criteria present unique problems to each engineering group working on the project. However, this report specifically covers the requirements the criteria imposed on the computer engineering portion of the ABRS.

2.1 General Guidelines

The general guidelines are: the ABRS must consist of a kiosk (a central unit housing the display and handling customer interactions) and one to five bike modules. Each bike module will house five bikes with individual locking stations for each one. The entire unit must be generally resilient to physical damage. In addition, it must be completely safe for operation with young children as well as adults.

2.2 Operating Conditions

In order for the bike system to operate year round, the components selected for the rack must be able to withstand the extreme temperature variations of the hot and cold weather experienced in the York, Pennsylvania area. The ABRS must also be intuitive and simple to use in each of these weather conditions. Additionally, the ABRS may be located in city areas. So, its components should be highly resistant to vandalism and theft.

2.3 Return Procedure