Amusement Park Scheduler Requirements Specifications

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Revisions

Version	Date	Owner	Reviewer	Sections Affected/Changes Made
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0.1.1	1/21/2005	Gerard	Dan	Addition of Non Functional requirements (Sec. 6)
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0.3.0	2/3/2005	Jesse	Allen	Removed unneeded information; Further defined other sections; Added additional missing information
0.3.1	2/4/2005	Dan	Sharon	Added interface figures, reformatted and edited prior changes

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1 Introduction

This section presents the goals and a general abstract of the APS system. An overview of the product, description of the purpose and scope of the product are also included.

1.1 Abstract

Amusement Parks have recently begun implementing automated ticket systems to increase overall guest satisfaction by reducing time spent waiting in ride queues, and to track visitor traffic and riding patterns. We propose a system that collects a larger variety of park data and encourages increasing QuickTicket usage, resulting in more efficient park flow in addition to offering guests easy to use interfaces to improve their park experience. Additionally, APS encourages return visitors by providing guests with a more enjoyable visit.

1.2 Purpose of this document

This document serves to specify the complete functional and non-functional requirements for the Amusement Park Scheduler project. It illustrates the various system features and functional details for the end-users and APS administrators.

1.3 Goals

APS is intended to provide amusement park goers with a more enjoyable experience and also to promote return visitors, thereby increasing park revenue and overall customer satisfaction.

1.4 Scope of the product

APS provides a web interface for amusement park goers to schedule an optimal itinerary for their park visit from home. Additionally, the APS system is available through in-park kiosks in order for visitors to view attraction line lengths, view suggested rides and attractions, and to track the last known location of their friends or family throughout the park. Visitors are also able to remotely access features of the APS system via their Pocket PCs and Mobile Phones.

1.5 Overview of the remainder of the document

The rest of this document presents functional and non-functional requirements for the APS system, including Interface schematics and data collection guidelines.

2 General Description

This section gives a general description of the APS system and describes the user classifications, general assumptions and dependencies. The description of the help documents available to users is also in this section.

2.1 Product perspective

APS is a replacement and improvement over the current FastPass^{™1} ride queuing systems implemented by amusement parks and other attractions. APS has increased usability and features from the older FastPass[™] systems, represented by its new web and mobile interfaces, and its visitor grouping capabilities.

2.2 Product functions

APS makes ride suggestions to its users and then allows the scheduling of those rides throughout the day based on the criteria defined in this document. These suggestions and schedules are made available through the web interface, via mobile devices, and through in-park kiosks. APS should be available to any web-enabled platform.

Suggestions made to the users are based on data collected by APS regarding the current and historical state of the park, its rides, and any preconfigured preferences of the park owner.

APS implements a user classification system consisting of Users and Premium users, wherein Premium users have additional functionality available to them at an optional additional cost, per the park owner's preference.

APS allows park visitors to create groups, which can be used to schedule events for all members of the group such as QuickTickets and meeting place. The group module also allows group members to look up the last known location of other group members within the park. This feature makes the group experience of the park more enjoyable, especially for families.

2.3 User Classifications

APS has three specific user types, defined below, which henceforth are used in identifying specific requirements applicable to each user type.

2.3.1 Purchaser

This classification represents the park itself, and the park officials who are in charge of the daily operation of the APS system. This document should be approved by the purchaser.

¹ FastPass is a registered trade mark of the Disney Corporation.

2.3.2 User

This is a typical park visitor who would buy a ticket when they arrive. Users have base functionality of the system as defined in the module and interface requirements sections of this document. The APS system is aimed at enticing the User to visit the park more often, and upgrade to a Premium User classification for its value-adding benefits.

2.3.3 Premium User

This is a repeat park visitor, subscribed to the premium service. This user is able to access additional functionality within the APS system as defined in the interface and module requirements below.

2.4 General constraints, assumptions, and dependencies

This section details the constraints, assumptions and dependencies the APS system has in order to function as described within this document.

- 2.4.1 Kiosks must be equipped with a card reading apparatus and an available form of user input depending upon the Kiosk type as defined in section 5.2.5
- 2.4.2 APS does not include accommodations for those with physical disabilities
- 2.4.3 All interfaces should be easy-to-use, so that fifth graders are be able to locate their group-mates
- 2.4.4 Any email enabled mobile device should have access to the APS via remote email communication.
- 2.4.5 Any wireless network enabled Pocket PC PDA should have access to APS via an additional interface downloaded to the PDA
- 2.4.6 To access the APS system, a PAC is required
- 2.4.7 One year's worth of park statistics is required for the suggestion module to make informed ride suggestions (in addition to suggestions made by the purchaser)

2.5 Documentation

This section details the help systems available to the users and in what ways they are available to the user.

2.5.1 Web Based Documentation

Available over the web interface; this help system outlines the web and mobile interfaces, and gives an overview of the APS system and the features it offers.

2.5.2 Mobile Documentation

Available over the mobile interface; this documentation is a help system allowing the user to receive a list of valid commands accepted by the mobile module of APS.

2.5.3 Kiosk Documentation

Kiosks have documentation in the form of a list of basic features and their operation within the kiosks. These lists can be made available in the form of instruction cards next to the kiosks themselves.

2.5.4 Premium User Manual

A short manual that is available to Premium Users at the discretion of the purchaser which details how to access and use the features available to Premium Users.

2.5.5 Purchaser Manual

This manual holds information regarding all features and functionality of the APS system including all available configuration options and an overall description of the APS system. The Purchaser Manual is compiled from the requirements and design documents.

2.6 System Overview Diagrams

This section details how the APS system is structured through the use of diagrams.

2.6.1 Overall APS System Diagram



2.6.2 APS Framework Diagram



3 Functional Requirements

This section details the functional requirements associated with the APS system. In particular the functional requirements of the modules are contained within this section.

3.1 PAC (Park Access Card)

This section details the functional requirements that are associated with PACs. PACs are access cards which are given to every park visitor in order to grant access to attractions within the park. They also help supply APS with the data it needs to make suggestions and make group locations available among other things.

- 3.1.1 PACs are access cards that are uniquely identified by a barcode as well as a 10 digit numerical identifier.
- 3.1.2 PACs act as a visitor's ticket or multi-day pass to the park.
 - 3.1.2.1 PACs are obtained and activated from the ticket office at time of purchase.
- 3.1.3 PACs are only valid for a specified range of dates.
 - 3.1.3.1 Date range is set by the park at time of purchase.
 - 3.1.3.2 PAC expires automatically when the date range has passed.
- 3.1.4 PACs can be read by a barcode scanning module.
 - 3.1.4.1 Barcode scanning ability to be implemented using Cue Cat barcode scanning devices attached to in-park kiosks.
 - 3.1.4.2 PACs have a UPC-A standard UPC.
- 3.1.5 PACs must be scanned at attraction entrances.
- 3.1.6 PACs must be scanned to access all in-park Kiosks.
- 3.1.7 Premium User's PACs are associated with a user id used for accessing Premium web features through the web interface.

3.2 QuickTicket Module

This section details the functional requirements associated with the QuickTicket Module. QuickTickets enable Premium Users to bypass standing ride queues to ride a specified attraction at a pre-scheduled time.

- 3.2.1 QuickTickets are associated with a Premium User's PAC.
- 3.2.2 QuickTickets are not available to non-Premium users.
- 3.2.3 QuickTickets are limited on a first-come, first-serve basis for configurable time intervals for each ride. The maximum number of QuickTickets available at any time is limited to the ride's capacity and ride length time or as defined by the Purchasers. A ride may be overbooked as specified in 3.6.1.1. *Example*: Tea Cup ride has 30 QuickTickets available every 10 minutes.
- 3.2.4 Premium Users are limited to a configurable number of QuickTickets for a configurable time interval.
 Example: Premium users can be allowed 5 QuickTickets every hour or 2 QuickTickets for an entire day.
- 3.2.5 Multiple QuickTickets cannot be scheduled within a configurable buffer time. *Example:* Premium User cannot have a QuickTicket within 15 minutes of another scheduled QuickTicket
- 3.2.6 QuickTickets are issued to individuals or entire groups through the scheduling module.

3.3 Scheduling Module

This section details the functional requirements associated with the Scheduling Module. Schedules are optimally ordered lists of attractions which visitors wish to ride during their visit to the park.

- 3.3.1 Schedules are created based on suggestions from the Suggestion Module or by the user directly.
- 3.3.2 Premium User ride schedules have specific times and may have QuickTickets associated with their scheduled ride list; Users schedules simply contain a ride order.
- 3.3.3 Schedules for standard Users are generated via the web interface, from the visitor's home. Schedules for Premium Users can be made via the web interface or in-park kiosks.
 - 3.3.3.1 Users cannot save their schedule within APS; it can only be printed at home via the web interface.
 - 3.3.3.2 Premium User schedules are saved to their account and are also accessible through the in park kiosks.

- 3.3.4 Premium Users can create Group Schedules for their Group of friends or family. Group Schedules created in this way apply only to Premium Users within the group.
- 3.3.5 The Scheduling Module can push alerts or reminders to a user's mobile device, if configured to do so as defined in section 3.5.3.

3.4 Suggestion Module

This section details the functional requirements associated with the Suggestion Module. The Suggestion Module provides users with a suggested list of rides based on criteria. And can also provide a set of next ride suggestions.

- 3.4.1 Presents the visitor with a selection of suggested next rides based on:
 - 3.4.1.1 Available user riding history
 - 3.4.1.2 Premium User preferences
 - 3.4.1.3 Current park state
 - 3.4.1.4 Current in-park location as determined by the kiosk being used
- 3.4.2 Suggestions are available via the in-park kiosks as well as via mobile devices.

3.5 Alerts Module

This section details the functional requirements associated with the Alerts Module. Alerts are messages sent to visitors via their mobile devices to inform them of upcoming group events, QuickTickets, or emergencies.

- 3.5.1 Alerts are generated by the Scheduling Module based on upcoming QuickTickets or other scheduled events.
- 3.5.2 Alerts can be used for emergency purposes to contact specific guests within the park; these types of alerts are also visible from park Kiosks
- 3.5.3 Event and QuickTicket Alerts are separately configurable as (on/off)
 - 3.5.3.1 Mobile Phone alerts must be associated with a Mobile Phone's email address
 - 3.5.3.2 PDA alerts require that the PDA be logged into the APS system and running the applicable software
 - 3.5.3.3 If no method for receiving alerts is specified by the User they will appear on the in-park kiosks when Users swipe their PAC.

3.5.4 Emergency Alerts can not be turned off.

3.6 Group Module

This section details the functional requirements associated with the Group Module. Groups have additional features available to them through APS. Each Group is associated with a set of PACs.

- 3.6.1 Premium Users in a Group can create group based schedules and group QuickTickets, so that every member in the group is scheduled to ride the same attractions together. This eliminates the need for every group member to individually set up their schedule for that day.
 - 3.6.1.1 Group QuickTickets have a configurable overbooking option to allow groups to sign up for Group QuickTickets. This means that if the number of QuickTickets requested exceeds the number of QuickTickets available for a specified ride the Group may still be able to set QuickTickets.
 - 3.6.1.2 Users in a group with Premium Users cannot share the group schedule, or obtain group QuickTickets.
 - 3.6.1.3 Group members may be flagged as not having access to create or modify schedules thereby restricting access to specific moderators.
- 3.6.2 Groups are created via in-park kiosks or via the web interface.
 - 3.6.2.1 Group creation via the web interface is reserved for Premium Users with an account to log into the web interface.
 - 3.6.2.2 Group creation via the web interface requires the user id of each user to be included in the group.
 - 3.6.2.3 Group creation through in-park kiosks requires the scanning of each PAC to be included in the group.
- 3.6.3 Group members can retrieve the last known location of other group members using in park kiosks or a mobile device.

4 Data Collection

This section details the data that the APS system collects and stores.

4.1 PAC Data (valid to both Users and Premium Users)

This section details the data associated with PACs that the APS system collects/stores.

- 4.1.1 Store the last scanned location of each PAC.
- 4.1.2 Store the attraction preference data and recent attraction history for use in the Suggestion Module calculations.
- 4.1.3 PAC data is stored until the PAC's expiration date has passed.
- 4.1.4 Current mobile device connection information for sending out alerts:
 - 4.1.4.1 PDAs require an IP address on the park's internal network.
 - 4.1.4.2 Mobile Phones require an email address.
- 4.1.5 Store user's name

4.2 Premium User PAC Data

This section details the data associated with Premium Users' PACs that the APS system collects/stores.

- 4.2.1 Store all information as described in section 4.1.
- 4.2.2 Store a PIN for access to premium features via the web interface.
- 4.2.3 Store personal and group schedule information.

4.3 Group Data

This section details the data associated with Groups that the APS system collects/stores.

- 4.3.1 Store the list of PACs in each group.
- 4.3.2 Store the list of group members with moderation (group schedule creation and modification) privileges.
- 4.3.3 Store Group Schedule data for Premium Users.

4.4 Ride and Attraction Data

This section details the data associated with park rides and attraction that the APS system collects/stores.

- 4.4.1 Store all general ride information (including intensity, speed, description, etc).
- 4.4.2 Store the current and estimated waiting times in line.
- 4.4.3 Store the history of popularity of the ride and peak usage data.
- 4.4.4 Ride locations and distance information throughout the park.

4.5 APS System Configuration Data

This section details the configuration data that the APS system collects/stores.

- 4.5.1 Following items are configurable by Park:
 - 4.5.1.1 Number of QuickTickets available per user per time period, there is a minimum of 0 QuickTickets per a single user per a day.
- 4.5.2 Following items are configurable by Attraction:
 - 4.5.2.1 Number of QuickTickets available per ride per time period, there is a minimum of 0 QuickTickets per a ride per a time period.
 - 4.5.2.2 Number of overbooked QuickTickets available per ride per time period, there is a minimum of 0 overbooked QuickTickets per ride per time period.
- 4.5.3 Following items are configurable by Kiosk:
 - 4.5.3.1 Logout timer length; automatically logs a user out after a period of inactivity, the minimum idle time before logout is 30 seconds.
 - 4.5.3.2 Kiosk Mode (Entrance Kiosk vs. Inner-Park Kiosk).

5 User Interfaces

This section details the requirements for the appearance and usability of each user interface of the APS system.

5.1 Web Interface

This section details the features associated with the web interface of the APS system.

Example-Interface Figures:



- 5.1.1 Allows access to the following modules: Scheduling, QuickTicket, Suggestion, Group.
- 5.1.2 Anonymous Access:
 - 5.1.2.1 View park map (see Figure 5.1-A)
 - 5.1.2.2 View ride information
 - 5.1.2.3 Generate User schedule (see Figure 5.1-B)

- 5.1.3 Premium User Access:
 - 5.1.3.1 Includes all functionality from section 5.1.2
 - 5.1.3.2 Create personal and group schedules with QuickTickets
 - 5.1.3.3 Forms to update user information, as described in section 4. (see Figure 5.1-D)

5.2 In-Park Kiosk Interface

This section details the features associated with the in-park kiosk interface of the APS system.

Example-Interface Figures:

PARKNAME	Suggestions		
	Shortest nearby line:		
SUGGESTIONS	Fun House 13 min		
	Shortest suggested line:		
PARK MAP	Roller Coaster 26 min		
GROUP	Other suggestions:		
	1. Gravitron 27 min		
SCHEDULE	2. Bungee 32 min		
	3. Hall of Mirrors 36 min		
EDIT USER			
LOG OUT	Hate wating in line? Wark to be able to create and save a Uuck licket schedule that gets you on every ride right away? Ask an attendant about a premium Park Access Card and never waste another minute!		
I			

Figure 5.2-A – Kiosk Suggestions Screen



Figure 5.2-B – Kiosk Park Map Screen



The current time is 12:25 PM. Currently scheduled rides SUGGESTIONS 2:15 PM - Wild Mouse 2:30 PM - Magic Coaster 2:40 PM - Dragon Coaster PARK MAP GROUP Roller Coasters 🔹 Super Looper • SCHEDULE ADD RIDE TO SCHEDULE 2.20 PM • EDIT USER LOG OUT View Schedule Make Schedule

Create a schedule

PARKNAME

Figure 5.2-C – Kiosk Schedule View Screen

Figure 5.2-D – Kiosk Schedule Create Screen

SUGGESTIONS	Your group's last known ride locations: <u>Current time: 5:40 PM</u> Tron 5:23 PM Roller Coaster 7	User Information and Preferences SUGGESTIONS	
PARK MAP	Jesse 5:30 PM Teacups	PARK MAP Name: Dan Jansen [Phone: [610 - 923 - 4065]]	EDIT EDIT
GROUP	Dan 5:36 PM Boats	GROUP	
SCHEDULE		SCHEDULE	
EDIT USER		EDIT USER Carol D: 1584652365 Ride preference: High Intensity	•
LOG OUT	-	LOG OUT	

Figure 5.2-E – Kiosk Group Screen

Figure 5.2-F – Kiosk User Preferences Screen

- 5.2.1 Allows access to the following modules: Scheduling, QuickTicket, Suggestion, Alert, Group
- 5.2.2 Formatted for a resolution of 800x600 for optimum readability and visibility.
- 5.2.3 User Features:
 - 5.2.3.1 Access suggested ride list (see Figure 5.2-A)
 - 5.2.3.2 View last known location of group mates (see Figure 5.2-E)
 - 5.2.3.3 View Park map (see Figure 5.2-B)
 - 5.2.3.4 View ride information and wait times (see Figure 5.2-B)
 - 5.2.3.5 Configure basic user information such as name, alerts status and configuration, and groups (as allowed by the Kiosk) (see Figure 5.2-F)
- 5.2.4 Premium User Features:
 - 5.2.4.1 All features listed in section 5.2.3
 - 5.2.4.2 If a schedule is available, it is displayed first.
 - 5.2.4.3 View/Create personal and group schedules (see Figure 5.2-D)
- 5.2.5 Kiosks have multiple modes of operation
 - 5.2.5.1 Entrance Mode
 - 5.2.5.1.1 Includes all Kiosk features
 - 5.2.5.2 Inner-Park Mode

5.2.5.2.1 Does not allow access to Group set up and User information Updates. This is to reduce the expected amount of time Users occupy an Inner-Park Kiosk.

5.3 Mobile Device – Text Interface

This section details the features associated with the mobile device text interface of the APS system.

Example-Interface Figures:



APS Group Locations: Tron @ Rollercoaster 5:23pm	
Jesse @ Teacups 5:30pm	4
	Send

Figure 5.3-C – Mobile Groups Screen



Figure 5.3-B – Mobile Alert Screen



Figure 5.3-D - Mobile Suggestion Screen

- 5.3.1 Allows access to the following modules: QuickTicket, Suggestion, Alert, Group
- 5.3.2 Features are accessible through text-based email.
- 5.3.3 Allows for a limited subset of the Kiosk features:
 - 5.3.3.1 Polling of group member locations
 - 5.3.3.2 Obtaining next ride suggestions
 - 5.3.3.3 Receiving alerts of QuickTickets and/or Group events.

5.4 Mobile Device – PDA Interface

This section details the features associated with the mobile device PDA interface of the APS system.

Example-Interface Figures:





Figure 5.4-A – PDA Map Screen



Figure 5.4-C – PDA Schedule Screen

Figure 5.4-B – PDA Group Screen



Figure 5.4-D – PDA Suggestions Screen

- 5.4.1 Allows access to the following modules: QuickTicket, Schedule, Suggestion, Alert, Group
- 5.4.2 Features are accessible through a downloadable application for the Pocket PC platform.
- 5.4.3 Allows for a limited subset of the Kiosk features:
 - 5.4.3.1 Polling of group member locations
 - 5.4.3.2 Obtaining ride suggestions
 - 5.4.3.3 Receiving alerts of QuickTickets and/or Group Events
 - 5.4.3.4 View current ride wait times
 - 5.4.3.5 View Park Map
 - 5.4.3.6 View schedule (if applicable)

6 Purchaser Interfaces

This section details the purchaser interfaces of the APS system.

6.1 PAC Sales Interface

This section details the features of the PAC sales interface of the APS system.

- 6.1.1 Has ability to initiate new PACs and disable existing PACs in the event that they have been lost or stolen.
- 6.1.2 Has ability to pre-set up basic PAC data for the visitors and Groups.
- 6.1.3 Has ability to create basic groups upon PAC initialization.

6.2 Purchaser Administrative Interface

This section details the features of the purchaser administrative interface of the APS system.

- 6.2.1 Allows the purchaser to access and adjust APS system configuration variables.
- 6.2.2 Displays statistical park and ride information.

7 Non Functional Requirements

This section details all of the nonfunctional requirements of the APS system.

7.1 Performance

This section details the performance nonfunctional requirements of the APS system.

- 7.1.1 Since the production APS system as defined in section 7.3.1.3 handles up to 10,000 simultaneous user interactions, the APS system requires servers with adequate resources to provide system stability and acceptable response times
- 7.1.2 For demonstration purposes the APS system, as defined in section 7.3.1.2, will handle up to 30 simultaneous user interactions.

7.2 Security

This section details the security nonfunctional requirements of the APS system.

- 7.2.1 APS System Security
 - 7.2.1.1 The purchaser is responsible for the physical security of the devices located in and throughout the park.
 - 7.2.1.2 Access to the server software and databases is secured with user authentication to eliminate potential risk.
 - 7.2.1.3 Park visitors have restricted access to the system, as provided by the user interfaces defined in section 5.
 - 7.2.1.4 Purchaser and park officials have secured access to the Purchaser Interfaces as described in Section 6.
- 7.2.2 PAC Security
 - 7.2.2.1 There is no specific security associated with the PACs themselves.
- 7.2.3 Web Security
 - 7.2.3.1 Limited features of the web interface are accessible by anonymous users.
 - 7.2.3.2 Secured features of the web interface are protected by a username and PIN of a Premium User account associated with a given PAC.

- 7.2.4 Kiosk Security
 - 7.2.4.1 Only the kiosk software should be accessible on the Kiosk.
 - 7.2.4.2 Kiosk features are only accessible to visitors after they have authenticated by scanning their PAC.
 - 7.2.4.3 If a user does not manually log out from the Kiosk, the Kiosks automatically log users out after a configurable inactivity timer.
- 7.2.5 Mobile Security
 - 7.2.5.1 Users must specify the email or IP address of their mobile device within their user information, so that unauthenticated users have no access to the system.
 - 7.2.5.2 PDAs have limited access to a wireless network to access mobile alerts as well as the mobile interface.
 - 7.2.5.3 Mobile phones must use their own email access to connect to the APS Mobile interface.

7.3 Hardware Requirements

This section details the hardware requirements of the APS system.

- 7.3.1 APS Servers & Kiosks
 - 7.3.1.1 All servers and kiosks must have the required framework of the chosen programming language installed.
 - 7.3.1.2 Demo System Hardware Minimum Requirements:
 - 7.3.1.2.1 Database/Framework/Web Server 1.5 gHz CPU, 512 megabytes of RAM, 80 gigabytes of disk space, 100 mbit NIC
 - 7.3.1.3 Production System Hardware Minimum Requirements:
 - 7.3.1.3.1 Database Server 2.4 gHz CPU, 2 gigabytes of RAM, 500 gigabytes of redundant raid disk space, gigabyte NIC
 - 7.3.1.3.2 Framework Server 2.4 gHz CPU, 2 gigabytes of RAM, 100 gigabytes of redundant raid disk space, gigabyte NIC
 - 7.3.1.3.3 Web Server 2.4 gHz CPU, 2 gigabytes of RAM, 500 gigabytes of redundant raid disk space, gigabyte NIC

- 7.3.1.3.4 Kiosk 1 gHz CPU, 512 megabytes of RAM, 40 gigabytes of disk space, 100 mbit NIC
- 7.3.2 PDAs
 - 7.3.2.1 PDAs wishing to access the APS system must have the required framework of the chosen programming language installed.
 - 7.3.2.2 PDAs must have an 802.11b compatible wireless device installed and configured to connect to the APS wireless network within the park.
- 7.3.3 Mobile Phones
 - 7.3.3.1 Mobile Phones must have email capabilities in order to access the APS mobile interface.

8 Appendix

A Appendix A – Definitions, Acronyms & Abbreviations

- A.1 APS Amusement Park Scheduler
- A.2 PAC Park Access Card
- A.3 QuickTicket System for scheduling tickets for a specified time
- A.4 Group A number of connected PACs

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