DIGITAL CHANNELS CUSTOMER JOURNEY FOR IMG THEME PARK

TECHNICAL PROPOSAL

Index

1. INTRODUCTION

We are honored with the opportunity to present this proposal, trusting that it corresponds and fully meets IMG Theme Park expectations. We express our total availability to submit additional explanations or that might be found appropriate.

This document presents proposal to deliver the Digital Channels Customer Journey for IMG Theme Park according to the requested features and requirements detailed in the RFP, also complemented by all the additional requirements identified during the negotiation between both parties.

We truly believe that we have a unique value proposition that combines best of breed components, our excellence in execution as well as a very attractive financial proposal. After analyzing this document you will be able to understand the proposed solutions, and our work methodology which is focused providing a superior solutions and enhancing our customer's satisfaction level.

For a better understanding of our proposal, please consider that this document is structured in the following sections:

Section 1 (Introduction), this section, that includes a brief introduction on this document and its structure;

Section 2 (Executive Summary), presents the executive summary for this proposal;

Section 3 (Proposed Solution), presents our solution, including project scope and solution details on both its functional and technical attributes;

Section 4 (Quality Assurance), details our quality assurance and testing methodology;

Section 5 (Erro! A origem da referência não foi encontrada.**)**, includes information on the included services to ensure end users proper training;

Section 6 (Erro! A origem da referência não foi encontrada.**)**, presents our business continuity services;

Section 7 (Erro! A origem da referência não foi encontrada.**)**, details our project management methodology;

Section 8 (Erro! A origem da referência não foi encontrada.**)**, includes the project implementation schedule and the list of all project deliverables;

1.1. DEFINITIONS AND ACRONYMS

Acronym	Description

SOA	Service Oriented Architecture
ESB	Enterprise Service Bus
TCO	Total cost of ownership
RFP	Request for Proposal
APAC	Asia Pacific

2. EXECUTIVE SUMMARY

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This document presents proposal to in conjunction with the IMG Theme Park launch the new Digital Channels Customer Journey for IMG Worlds of Adventure Park as part of IMG Theme Park vision to best use technology to extend the customer experience beyond the theme park and to ensure that customers engage with the IMG Brand inside and outside the premises in a consistent manner.

We are a global provider of mobile enablement solutions, operating in more than 80 markets in five continents. Last year our company revenue surpassed 500 M USD worldwide following a growing trend of two digits year over year. We have a strong presence in Latin America and Middle East and we are rapidly expanding our operations in Africa and Asia Pacific region.

The current proposal is based on our solution for big events, and includes the development of several custom components that we will combine with others we have selected from the marked based on their reliability and capabilities. We are fully convinced that by combining best of breed solutions with our excellence in software development and integration, we are presenting a very competitive proposal which will allow the IMG Theme Park to fulfil their objectives.

While designing our solution for the IMG Worlds of Adventure Park, we understood that for precise areas of the system we do not own proven technological solutions, and therefore we selected the bests from the market. As part of the services included in this proposal, we will integrate these components into the final solution, providing a fully unified solution to IMG Theme Park.

In detail, we decided to use the indoor navigation SDK from INFSOFT, and the augmented reality SDK from Wikitude. Later in this document we will provide additional information on both these companies and some of their most relevant case studies.

In what concerns to base software, our proposal is to support in Microsoft Software (Windows Server and SQL Server), which ensures full system capabilities in terms of performance, availability, and scalability while maintaining the best TCO for IMG Theme Park, considering current IT team skill. Optionally, and as part of this proposal, we include a reference physical infrastructure, including backups and disaster recovery environments.

The physical infrastructure (servers) included provides high availability by deploying redundancy at all levels, and our solution will be designed following a full service oriented architecture (SOA). By using this architecture, we will implement the system in decoupled layers, allowing IMG Theme Park to decide on different approaches to scale up the infrastructure if needed.

We are truly convinced that we have a unique value proposition that combines market best of breed components, our excellence in execution and a very attractive proposal.

3. PROPOSED SOLUTION

For IMG Worlds of Adventure we deploy our own mobile payments platform. This software component has been used as a core technology for business, supporting our m-money unit which handles more than 700 million transactions per year.

Besides proposing the implementation and deployment of a set of software components that fully comply with the requirements identified in the RFP, we also included all scope changes that were included during the proposal negotiation phase with IMG Theme Park, some of which will also contribute to extend users experience and therefore achieving higher ratings and satisfaction levels.

Mobile applicants have gone through a big evolution in the last years, from the early days where they only provided almost static content, they have changed and are now adapting to the users, providing not only content and information, but the right one for a specific user at the moment they need it the most.

Also relevant for the success of this IMG Theme Park initiative is the information that will be available to the visitors. Here it's important that IMG Theme Park gathers the relevant skills to provide updated and valuable content to application users. While not part of the proposed solution, we may provide content management services based on our extensive expertise on this area.

Our solution has the following advantages:

- Fully integrated solution, contributing to enhance and improve visitors experience;
- Rich function set, providing a truly smart and user friendly solution;
- Leveraging on mobile application to achieve a brand new level of responsiveness and easiness of obtaining the services by the visitors;
- By implementing our solution supported on proven IT architectures and technologies, and by leveraging on market best practices, we ensure that the system will be able to easily adjust to the ever changing business needs.

3.1. SOLUTION OVERVIEW

Our solution is based on an integrated vision where a set of ICT system cooperate to achieve higher visitor's satisfaction, while increasing the management and control over the park operation.

The following diagram presents this integrated vision.

By the presented approach, there are tree systems which are highlighted, either because of their aggregator nature or by their relevance for several other systems.

The mobile app, which is the companion app for park visitors, is also the centralization point of all the other systems. This is one of the key point of our vision for this systems, as we conceive the solutions placing visitors at the centre. It's true that some of the deployed systems focus improving park management and operations, the final should always be to improve the visitor's experience.

Also relevant is the wristband, as it can be used as enabler for several other systems, like for instance electronic payment, people tracker, crowd management and access control. Please note that as per requested, we will provide the wristbands only for child tracking and electronic payment, nevertheless IMG Theme Park should consider the usage of such devices as park tickets, which would them allow for them to be universal (each visitor has one) and therefore enable the crowd management and universal personal tracker inside the park area.

Finally we would like to highlight the Business Intelligence solution, which will gather information from all available and relevant systems, and allow both operational and management improvements.

Business intelligence (BI) is a multi-dimensional tool – like a Swiss army knife, which can be used in so many different functional settings, and therefore its value propositions for a specific company can be unclear. In fact, many have very different ideas about BI and its benefit to organizations

At a higher level, the business intelligence and analytics solution for IMG Worlds of Adventure is a tool for either planning and control or enhancing the performance of the park. Essentially, we believe that leveraging business intelligence to create business value is all about aligning platform capabilities with organization core business processes to improve business performance, and its profitability.

The business intelligence solution will focus on information integration, therefore combining data originated from several disperse systems, allowing managers and analysts to perform complex analysis, where they can combine data that otherwise they would not be able to

3.2. PROJECT SCOPE

The current proposal includes all needed activities to design, validate and deploy the Digital Channels Customer Journey for IMG Theme Park and according with the received request for proposal.

In detail and during the planed project schedule our teams will execute the following activities (all activities not included bellow are therefore considered not part of the project scope):

- Document and approve project requirements and architecture for all system components;
- Propose and approve mobile application layouts;
- Propose and approve management console application layouts;
- Propose and approve kiosks application layouts;
- Propose and approve Queue Buster application layouts;
- Propose and approve Partner Sales System application layouts;
- Document integration interface with external systems;
- Configure and deploy electronic payment platform;
- Develop and configure the integration processes with existing systems from IMG Theme Park (IMG Ticketing System; Identity Management System; Loyalty Program System; Billing System; ERP).
- Develop the mobile application;
- Integrate indoors navigation SDK;

- Deploy beacons and configure venue for indoors navigation. Please note that for this proposal we assumed that we will deploy 3000 beacons, allowing the indoors navigation solution to cover the all area of the Park;
- Develop the management console (including marketing dashboard, inventory tracking, asset and personal tracking);
- Develop the custom application for interactive kiosks;
- Develop the queue buster application (tablet application);
- Develop the partner sales system application (web and mobile versions);
- Validate all developed and configured components;
- Provide and install the servers needed to host our solution;
- Provide, install and integrate all the solution hardware (RFID Readers; BLE Beacons; Servers and Virtualization Software; Kiosks)
- Provide and install anti-shoplifting system.
- Assist on any doubts arising for acceptance tests;
- Train system managers on the usage on the system administration module;

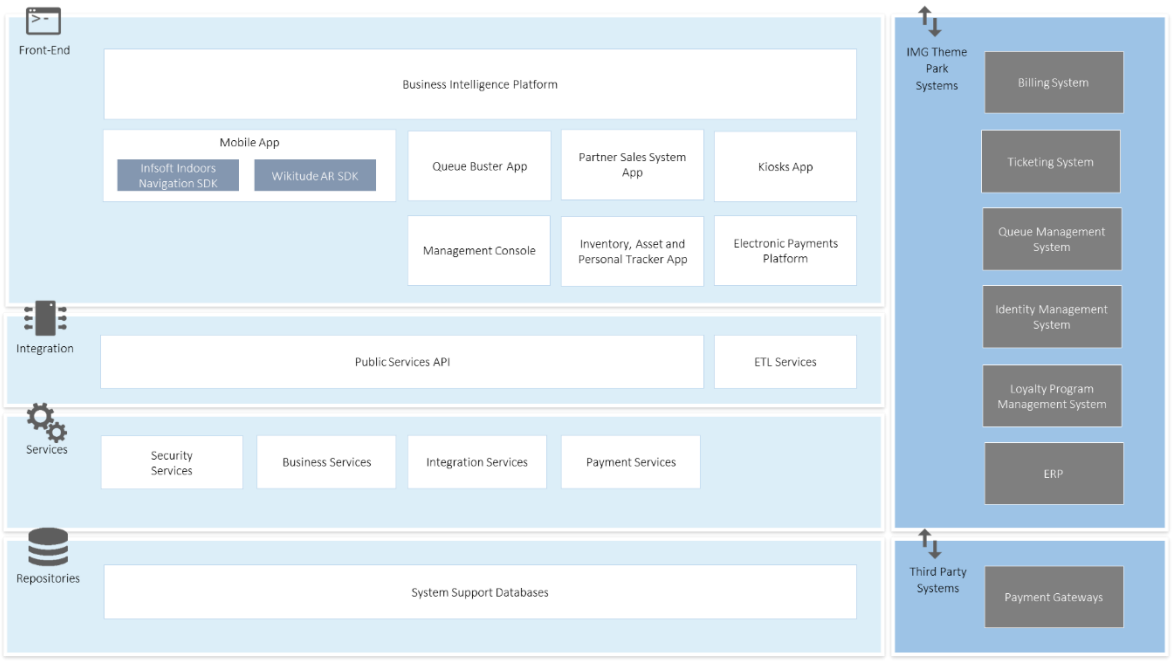
Please note that as part of this proposal we do not include any cost that may be associated with the activation of user accounts to publish the IMG Worlds of Adventure application on mobile stores.

In order to avoid the need for PCI-DSS certification for the system, all payments, wallet top up/top down will be forwarded to MasterPass. This ensures that our system never collects information regarding visitors credit card, and therefore no PCI-DSS certification is required..

3.3. FUNCTIONAL OVERVIEW

This section provides an overview on the features to be provided by the system. Please consider that this information is subjected to be adjusted during the earlier stages of the project (as long as all parties agree with that), to ensure the final results are completely aligns with IMG Theme Park expectations and needs.

The following diagram presents the more relevant functional blocks and systems.



3.3.1. BUSINESS INTELLIGENCE PLATFORM

For the business intelligence platform, our proposal is to use Pentaho community edition. We will deploy and configure Pentaho software platform and develop all the ETL flows, Dashboards and Reports using the tools provided by this version of the software. Please consider that in the case that IMG Theme Park decides to move to paid version of Pentaho, the software manufacturer guarantees that all components developed using the community edition will be automatically migrated and available to end users.

To fully comply with the project goal identified by the IMG Theme Park, we will develop a set of predefined reports and dashboards, and provide technical assistance and training to empower IMG Theme Park specialists on how to explore the business analyses solution.

Data Sources

One of the key factor of success for this project is to ensure that all relevant data gets into the business intelligence platform. During the first phase of the project, our team will work closely with IMG Theme Park and other system implementation teams, specially focusing data sources identification as also all relevant associated transformation and consolidation rules.

At this moment is not possible to have a clear understanding on all the data sources that will be connected and provide information to the analytical platform, therefore and for project scope definition, this proposal includes the services needed to design and develop twenty ETL flows to consume information from data sources, like for instance: mobile app analytical information; ticket sales system; billing system.

Key Performance Indicators

Key Performance Indicators (KPI) are measurable values that demonstrates how effectively an organization is achieving its key business objectives. Organizations use KPIs to evaluate their success at reaching established targets.

As part of the services included in this proposal, our business experts will work closely with IMG Theme Park management and operations teams to ensure the identification and detail of all relevant KPI's.

Once again at this moment is not possible to have a clear understanding on the full list of KPIs to compute, neither it would make sense to right now establish the list of ones to be computed, as this list will depend form the identified data sources, and also from established business targets. Nevertheless, and to estimate proposal effort, we estimated the definition and implementation of fifty KPIs as part of the services included in this proposal.

Based on our past experience in similar projects, we provide the following list to present a general idea on some of the KPIs that may be available on the analytical system:

Area	KPI	Dimensions
Ticket Sales	Number of sold tickets	Time interval; Sales channel; Customer type; Ticket type
	Revenue from ticket sales	
Finance	Revenue	Time interval, Category
	Expenses	
Systems	Visitors	Time interval; Customer type
	Contact Center Calls	Time interval; Contact Type; Outcome
	Social Media Posts	Time interval; Tone; Nationality
	News Articles	Time interval; Tone; Nationality; Media Source
	Mobile App Downloads	Time interval; Nationality; Device Type
	Mobile App Active Users	Time interval; Nationality; Device Type
	Energy Management: Consumption	Time interval; Power Source
	Energy Management: Production	Time interval; Power Source

Please note that the list of KPIs provided above is just for better understanding of the capabilities of the analytical platform, during the initial phases of the project we will detail the concrete list of KPIs to provide.

Reports and Dashboards

To boost initial usage of the analytical system, we propose to develop and deploy a set of reports and dashboards. These contents will help systems users on better understanding system capabilities, and data exploitation possibilities.

During the early stages of the project, our team will work closely with all IMG Theme Park departments to ensure each gets a set of initial contents that will help them to explore and get the maximum out of the analytical system.

In this stage of the process, it is not possible to list all the reports and dashboard to develop, as it is also not possible to detail each of them. For the purpose of effort estimation, we included in this proposal the services needed to detail, develop and deploy 50 reports and 10 dashboards.

3.3.2. MOBILE APP

The Worlds of Adventure mobile app will be available on both android, iOS and Windows Mobile devices, supporting multiple form factors, for mobile devices and tablets. Optionally we may also develop a companion app for smart watches, taking advantage of the growing tender for such devices and providing a modernity and innovation image for the IMG Worlds of Adventure Theme Park and Brand.

Taking under consideration the current penetration level of each version of the given mobile platforms, the application will be supported on

- Android version 5 or greater
- Android Wear version 5 or greater
- iOS version 9 or greater
- iOS version 9 or greater
- watchOS version 2 or greater
- Windows Mobile 10

The mobile application will provide the functions detailed next (please note that final version of functional specification of the application will be defined during project early stage of the implementation project)

Along with the functional description we include several images of proposed layouts for parts of the application, please note that those images represent an early stage draft and final versions of them

will result from project activities planned for the design stage, during which we will discuss and agree with IMG Theme Park on final application layouts.

Low Mobile Data Usage

Users expect from applications that they install on their smartphones, to behave in terms of battery and mobile data usage. In fact this poses a determinant argument wen users eventually decide to uninstall the application.

Our proposal is to deploy application data at the mobile device. This file (estimations is for it to be smaller than 1MB) will downloaded as part of the initial application installation, and after that a synchronization processes will ensure the device database is updated. This synchronization process will be executed over Wi-Fi connections whenever and only when updates exist on the central database (the application will allow users to authorize the update to run over mobile data).

By providing such mechanism, we constrain application data needs to the minimum necessary and only for functions demoing real time information like for instance:

- Updates and notifications on current queue system status;
- Buy Park Tickets;
- Booking tables at in-park F&B outlets;
- Booking of FastPass for rides;
- View information regarding IMG Cashless Wallet;
- View information regarding the loyalty program;
- Integration with social media;
- Collecting feedback from users;

Push Notifications

The mobile application will also pose itself as a direct communication between IMG Theme Park and visitors. Communication will be established by targeted push notifications, which can be generated using the management console. Additionally, users will also be notified every time an updated version of the application is available to download.

This notification system can be used by the IMG Theme Park to establish direct marketing communications, feeding information regarding promotions and events to a given application users segment. Please check for more in the Marketing Dashboard section.

Mobile Analytics

Mobility is rapidly changing the core dynamics of customer/organization relationships. As customers grow their adoption and use of mobile devices, organization are increasingly incorporating more and more capabilities on their mobile channels.

A recent report by the Aberdeen Group found companies using mobile analytics saw an 11.6 percent increase in brand awareness while those without a mobile-specific analytics strategy had a 12.9 percent decrease.

As part of our proposal, we will instrument the mobile application and we propose to use google analytics as platform for storage and analysis of mobile application usage information, but we can use a different platform if requested by the IMG Theme Park (assuming that the effort on using such platform is equivalent to the one associated with the usage of google analytics).

Authentication

Users will be allowed to use the application in both anonymous and authenticated mode. While working in anonymous mode, the application will not provide any functionality connected to user profiling, social media integration.

Proposed solution will allow users to choose to create a custom account for the IMG worlds of Adventure App (where they will provide a set of personal information that will be defined during the system design phase) or to authenticate in the application using their Facebook or Google account.

Points of Interest (Location Based Content)

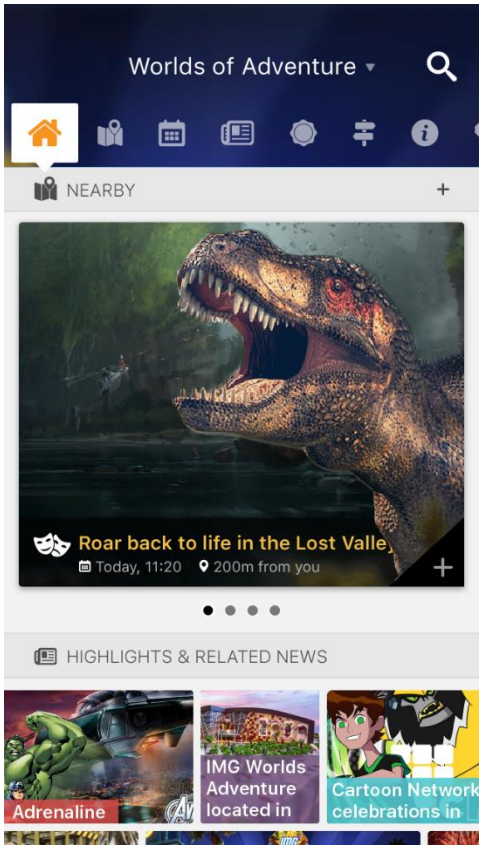
A point of interest identifies a given location by a fence (point plus radius). Every time a user enters/leaves or hangs on a given point of interest fence for a configurable time interval, the application will optionally (depending on the configuration):

- Display a given content (event, park diversion, restaurant, etc.) at the home page;
- Send a push notification to the user (for instance alerting that the user is near a park diversion, a given restaurant, etc.).

All features related with points of interest will depend on the user allowing the mobile app to use their Bluetooth connection (as part of this proposal we will deploy small beacons that will be used to compute the user location while indoors).

Home Screen

The home screen will be the one all users will face after launching the application. Our proposal is to take advantage on device sensors, and if allowed the application will present location based content. For instance, if the user is at Dubai international airport, the application will show information about it and provide quick access to related services (this capability is connected to the definition and configuration of points of interest).



The image above shows the proposed layout for the home screen. Please note that the image is cut down for simplicity, in devices the contents will scroll vertically.

The image shows an example supposing a given event is marked has highlight. Major objectives for the application homepage is to provide quick access to relevant events and information.

Events Browser

The application will provide an events browser that will allow user to find a given. Proposal is to organize events either alphabetically by their name, by category or using a calendar view.

The events browser will be provided as an alternative way to get access to events, and will be highlighted in the application home screen whenever the system lack location base content to show (for instance the user is not near any point of interest).

Park Diversions Browser

The application will provide a park diversions browser that will allow user to find a given diversion. Proposal is to organize diversion either alphabetically by their name or by category.

The diversions browser will be provided as an alternative way to get access to park diversions information, and will be highlighted in the application home screen whenever the system lack location base content to show (for instance the user is not near any point of interest).

Event Screen

For each available event, the application will provide a details page including all relevant information (like for instance location; eventual ticket costs; comments from friends and other user; etc.).

Park Diversion Screen

For each available park diversion, the application will provide a details page including all relevant information (like for instance location; current waiting queue size; comments from friends and other user; etc.).

Indoors Navigation

Allows park visitors users to get turn-by-turn guidance between two given points in the park area.

As part of our indoors service navigation, we will deploy Bluetooth Low Energy beacons that will provide information for indoor positioning.

We will also load and configure maps (to be provided by The IMG Theme Park). This configuration will include the definition of points of interest/way points and also available walking paths.

Please note that the proposed indoors navigation system fully supports venues with multiple floors, providing information to users on the locations where they can change floors (by using lifts or stairs).

To provide this functionalities, we will integrate the SDK from infsoft, providing therefore a very robust indoors navigation solution. As part of the infsoft SDK, we will provide the following components

Maps Library

The Maps Library offer built-in downloading, rendering, and caching of Maps tiles, as well as a variety of display options and controls.

GeoItems Library

The GeoItems Library offer built-in access and searching for geo items (e.g. shops, restaurants, rooms, toilets …) functionality.

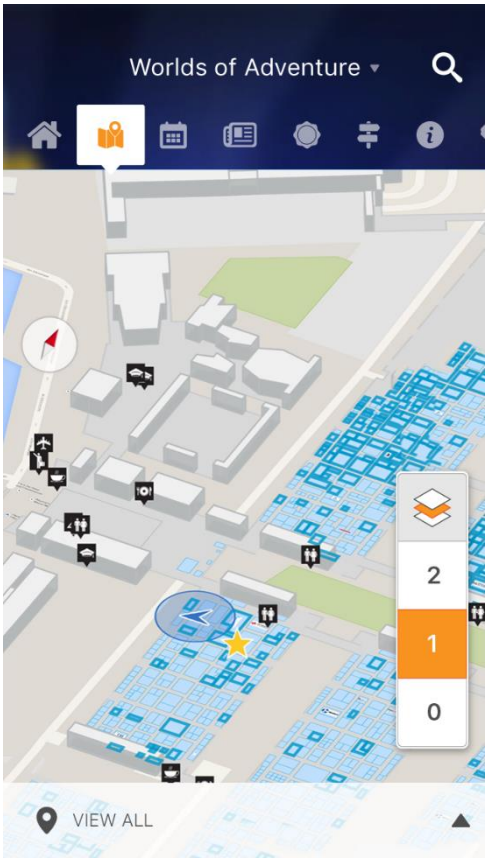
Locator Library

The infsoft APIs includes an Indoor positioning external library. The Locator Library offer built-in offline client-side indoor positioning based on Wi-Fi, Bluetooth Beacons and internal smartphone sensors.

Routes Library

The Routes Library offer built-in indoor routing and routing information functionality.

The following image presents a proposal for the layout of the indoors navigation functionality



Car Locator

The smartphone application will also allow visitors to store their car location in the park, so that latter they can use the indoors navigation features to get guidance on their way back to the car. To allow visitors to store their car location, we will also deploy Bluetooth low energy beacons in the park, and we suggest also the usage QR codes painted in the park pillars (visitors will store their car location, by scanning these QR codes using the IMG Worlds of Adventure smartphone app).

Visitor Profiling

Mobile applicants have gone through a big evolution in the last years, from the early days where they only provided almost static content, they have changed and are now adapting to the users, providing not only content and information, but the right one for a specific user at the moment they need it the most. Such evolutions created expectations on all of us, we now demand personalized experiences from the apps we install in our devices.

In order to enhance and personalize application user's experience, we propose to deploy an advanced profiling engine that will create visitors profile according to application usage and visitor's way around the park. The profiling engine will collect the following information:

- Places the user mark as favorites;
- Places visited and time spent at each park area;

By combining the advanced profiling engine with information from friends from the social networks, the IMG Worlds of Adventure smartphone application will be able to present valuable suggestions to users (like places to visit, goods to buy, etc).

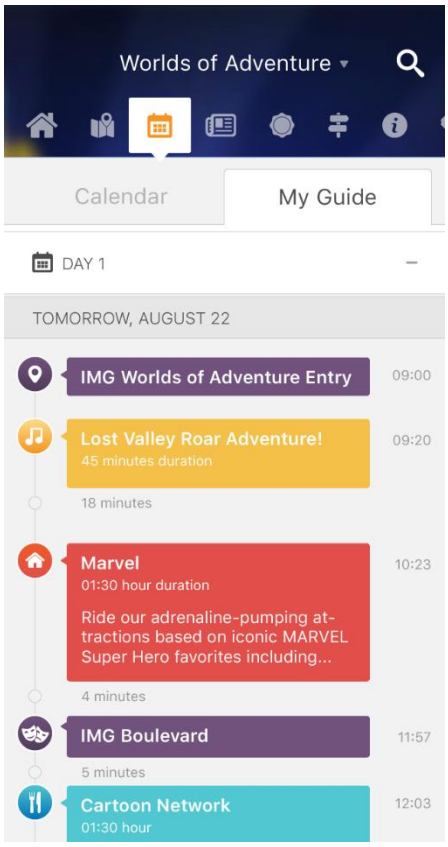
My Guide

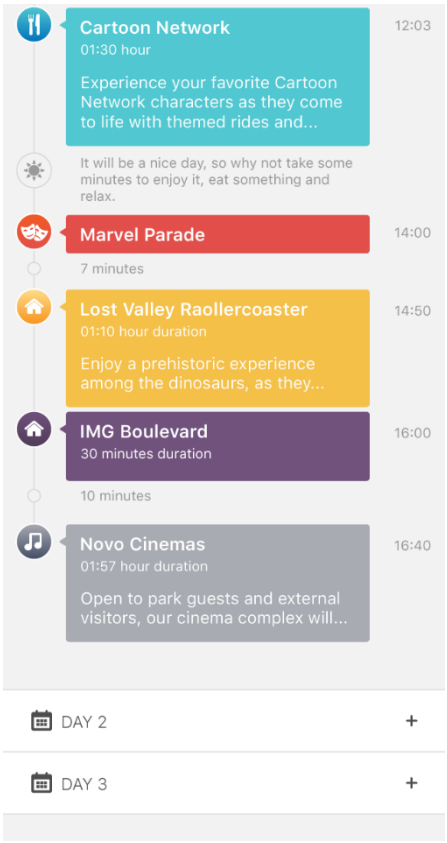
The personal guide will allow application users to plan in advance their visit to IMG Worlds of Adventure. The guide will be a multi-day plan for visitor's way around the park.

By using the park visitors will be allowed to mark events and park areas as the ones they want to visit, and with that information the application will suggest a guide around the park, estimating the time to spend in each venue and while commuting.

Additionally, the application will also use the information collected into the user profile, and suggest park spots (diversions, restaurants, etc) the visitor may find amusement. Such venues will be proposed in the user personal guide, giving the user the ability to accept or reject the suggestion (please note that users reaction upon application suggestion will also be considered as valid information for the profiling engine, therefore improving the application results on future suggestions).

The following images present and early stage proposal for the My Guide section layout.





Please note that for simplicity the layout was split into 2 images, in devices this will be only one screen with vertical scroll.

My Passport

We also propose to add to the application a passport feature. The passport would be an area were park visitors will be able to see all their past visits to any park diversion. Also visitors will be able to see their friends passports (if the app is connected with a given social network account), and share their information on social networks.

Latter the passport can also be used for marketing and cross selling activities.

Purchase Cinema Tickets

The mobile application will display links to allow users to book and purchase cinema tickets. These links will redirect users either to a web site or to a mobile application dedicated to the cinema (please note that both the web site and mobile application for the cinema are not considered as part of this project scope)

FastTrack and VIP booking

By using the mobile application, park visitors will be allowed to book for FastTrack or VIP access to given park areas.

On completion of the booking process (to be detailed during the project design phase) the visitor will receive a virtual token (rendered as a numeric or QR code) that he will be able to get access to the booked service.

Retail and F&B Order Ahead

The mobile application will allow park visitors to place and order for a retail or F&B shop. This interface will be similar to the proposed solution for the queue buster application.

On completion of the order, the visitor will get a virtual token (rendered as a numeric or QR code) that we will be able to show at the counter to pick up his order.

Wristband Management

The proposed solution includes using RFID wristbands for children. Our approach is to give smart app users full capabilities on managing family wristbands, by creating people groups. After defining their people group, application users will be allowed to:

- Locate and track any of the peoples of the group;
- Transfer small amounts of money from their IMG cashless wallet to a given wristband;
- Buy a ticket and associated with a given wristband;
- Associate a given virtual token to a given wristband (allowing any member of his family to pick up goods ordered in advance at the retail or F&B counter);

The application will be able to recognize wristbands either by reading the RFID tag, or by allowing users to insert the wristband numeric id (by doing so the proposed solution will also work on smartphones without RFID reading capabilities).

Please note that the wristband id will be printed out in the interior part of the device, and will contain check digits that will prevent someone from creating groups trying to guess out ids.

IMG Cashless Wallet Information

The IMG World of Adventure smartphone application will also have full management capabilities over the wallet solution. In fact the vision is that visitors will use only this application as their way to get information and make changes over their wallet (like for instance getting their statement, transferring money, and topping up wallet balance using their credit card). Please note that the full set wallet management features that will be available through the smartphone application will be detailed during the project design phase.

Based on our user centric approach we are fully convinced that it does not make sense to provide separate applications (one for the wallet and other for the park). In fact, application users more and more expect features to be integrated and application are expected to be simple and to make their users life easier.

Call for Assistance

The mobile application will provide users the ability to place a call for assistance. If a given user presses the emergency button, the application will place a call to a configured number. Please note that the assistance number is configured using the management console.

Call for Taxi

The mobile application will provide users the ability to place a call for a taxi. If a given user presses the “call taxi” button, the application will place a call to a configured number. Please note that the taxi number is configured using the management console.

Loyalty Program Integration and Simple Gamification

The worlds of adventure mobile app will also provide information over the park loyalty program. This integration will allow application users to check their current balance and to complete their customer profile information.

The application will also provide users with a content page displaying information regarding the loyalty program.

Additionally the proposed solution will provide simple gamification features. The system will allow IMG Theme Park managers to assign a associate (using the management console) a number of points to specified application actions (wallet top up, buying goods, buying tickets, pairing the family, going

into a given attraction). Any time the user performs a given action, it will be awarded the configured amount of points.

The management console will provide management team with game score tables for current day, current week and current month, therefore allowing to leverage on existing marketing tools to reach the winners.

Augmented Reality Solution

The application will provide augmented reality features. In the part of the scope of this proposal we will provide the framework for augmented reality content, but IMG Theme Park will be responsible on providing the content (videos or 3d models) to display on the mobile app.

The augmented reality platform includes image recognition & tracking, 3D model rendering, video overlay and location based augmented reality.

The solution will allow for up to 100 images to be recognized automatically. On top of those images the application will overlay 3D objects or videos (to be provided by IMG Theme Park).

Integration with the Queue Management System

The smart application will be integrated with the queue management systems. Such integration will allow visitors to understand the estimated time they will stand on the queue of any given attraction.

The application will also provide notifications for queue lengths on attractions. While browsing attractions and on attraction details screens, visitors will be able to ask for a notification if the attraction queue goes below a given threshold (in minutes).

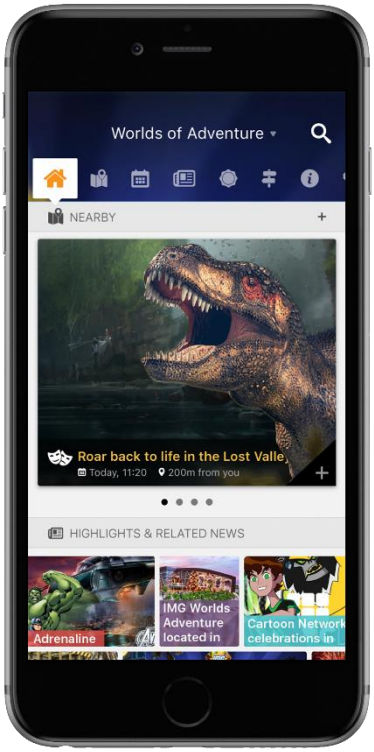
Integration with the Locker Management System

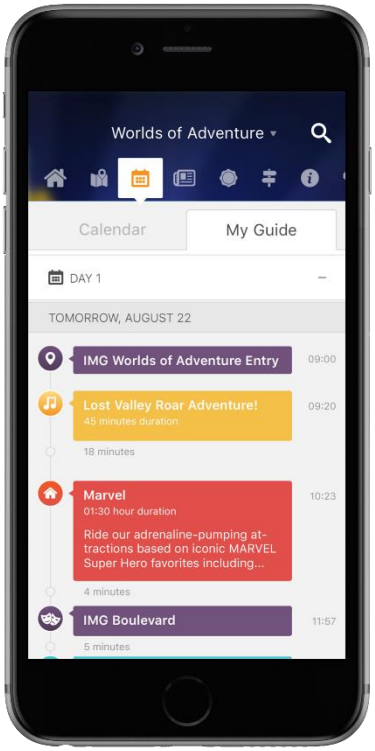
The application will be integrated with the existing locker management system. This will allow users to book/pay for the lockers, and get notified if leaving the park without previously picking up their items. Please note that features available on the mobile application depend on the API exposed by the locker management system.

Mockups

The following images present mockups of the presented layouts in actual devices. This are early stage drafts and shall be revised during the project design phase.


IMG
WORLDS OF
ADVENTURE
Live the epic adventure !


Worlds of Adventure
NEARBY
Roar back to life in the Lost Valle
Today, 11:20
200m from you
HIGHLIGHTS & RELATED NEWS
Adrenaline
IMG Worlds
Adventure
located in
Cartoon Network
celebrations in


Worlds of Adventure
Calendar
My Guide
DAY 1
TOMORROW, AUGUST 22
IMG Worlds of Adventure Entry
09:00
Lost Valley Roar Adventure!
45 minutes duration
09:20
18 minutes
Marvel
01:30 hour duration
10:23
Ride our adrenaline-pumping attractions based on iconic MARVEL Super Hero favorites including...
4 minutes
IMG Boulevard
11:57
5 minutes

3.3.3. MANAGEMENT CONSOLE

The management console (system back office) will allow IMG Theme Park non-technical experts to fully manage the solution, by autonomously defining the contents to be presented to users.

The management console will be available on desktop computers through a modern web browser (Microsoft Internet Explorer version 11 or higher; Apple Safari version 9 or higher; Google Chrome version 46 or higher). The website will be developed using responsive layout, making it suitable for usage in mobile devices (mobile phones and tablets).

The management console will also act as a content management tool, allowing authorized users to define the contents to be provided to visitors. In detail the management console will provide the tools to load all the park information (diversions, news and events).

Access to the management console will be protected by a login page, meaning that only authorized user will be allowed to access and use the management console.

Users, Groups and Profiles

The management console will allow IMG Theme park to manage users, groups and profiles.

Additionally authorized users will be able to associate profiles with users and groups therefore controlling what information and functions those users will be granted to.

Please note that application profiles will defines a set of features and information that users are allowed to perform/access on the system. All system provided API's will also be protected demanding the caller party to provide credentials from an authorized user (the proposed solution will be based on standards such as WS-SECURITY and OAUTH2 to ensure authentication over API's).

Manage Categories

Allows authorized users to manage categories (to be applied to events, news and park diversions), allowing changes on categorization and browsing to be performed without the need for any application update or deployment.

Each category will be assigned a name and an icon, allowing the application to provide users with a graphical interface.

Manage Events, News and Park Diversions

The management of events, news and park diversions allows IMG Theme Park to manage the contents displayed to users. For each one the tool will allow the definition of all associated information.

For events, news and park diversions the management console will allow the association with one or more picture. Such pictures will be used when displaying the content in the mobile application.

Manage Points of Interest

The management console will allow the management of points of interest, by defining new fences (point plus radius) and associating a behavior with such fence.

Please note that supported behaviors will be the definition of the highlighted content in the home screen or sending push notifications.

The system will not support intersecting points of interest, if such configuration is established, only one of the configured behaviors will be executed.

Manage Notifications

Provides direct communication between IMG Worlds of Adventure Park and application users. The management console will allow IMG Theme Park to specify a message and select a set of users as destination.

The management console will provide simple user segmentation capabilities, depending on the profile information collected (for instance, country of origin, age, etc.).

Analytical Dashboard and Reports

The analytical dashboard will provide information on relevant KPI's connected to IMG Theme Park operation and management. In detail this area of the management console will be a link to a configured workspace in the IM Theme Park business intelligence platform.

Customer Account Management

The management console allows authorized users to perform customer account management. In detail this will allow to manage all customer data, including the associated IMG Cashless wallet. Please consider that each wallet will have a unique ID (associated with de customer cell phone). The electronic payments system manages a "jumbo account" for all the wallets and has the information on the current balance of each wallet.

Customer account management will be available as a set of forms that allows to edit existing customer information. Please note that it's assumed that customers are IMG Cashless wallet owners, and therefore account creation occurs automatically whenever they install the smartphone application and agree with the enrollment in the IMG cashless wallet program (the enrollment process will collect the minimum set of customer data to establish a valid customer account).

Service Fees Management

The management console will provide the needed tools to manage service fees to be charged to customers on usage on any of the available payment methods. The system will support complex fees that will depend on the ranges of payment value, day of the week, hour of the day and recurrent access to a given service.

To ensure no ambiguity exist between any of the configured fees, users will be allowed to define a fee order that will determine which fee is applied in the case of multiple active matches.

IMG Cashless Wallets Management

The management console will also allow to perform all the requested cashless wallet management functions. This operations will be done by integration with the electronic payments platform. Please consider that whenever possible, the management console will provide links to electronic payments platform management tools.

Child Tracking

The management console will allow any authorized user to locate anyone wearing a wristband. For that users will insert the wristband id, and the application will show the last known location in the park map.

Personnel and Assets Tracking

The same functionality available for child tracking will also allow tracking of park personnel wearing active RFID tags and assets with active RFID tags attached.

Besides displaying personnel and assets on the map, the management console will also provide electronic forms to register the tags, associating them with a given asset or person.

Please note that the form will serve to collect, edit and view asset name and description and no other features will be available besides providing the asset localization.

3.3.4. QUEUE BUSTER APP

To address identified queue buster requirements we propose the development of a mobile app targeting android tablets. This approach allows IMG Theme Park to avoid lock in to any given hardware supplier, and to leverage on a big range of low cost seven inches android tablets.

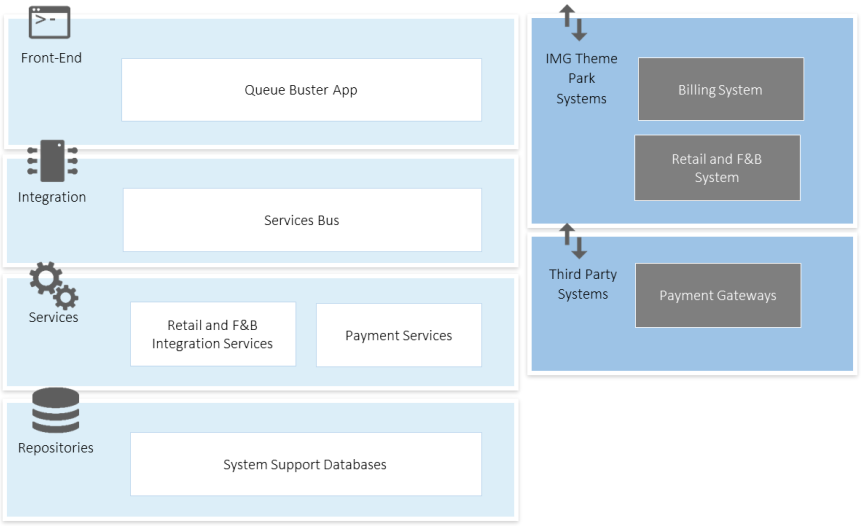
To fully compose the layout for queue buster assistances, we propose the usage of small mobile printers that will serve to print out a small ticket that will be used at the retail of F&B counter. Our suggestion is to use the START M-S220i 2" iOS, Android, Windows Bluetooth mobile printer (please check for more information at the Hardware BoQ section)

As part of the services included in this proposal, we will develop this tablet's application, which will allow park staff to assist on clearing queues on retail and F&B areas. By using their tablets park assistances will be able to record customer requests and communicate such information to the retail or F&B handling system (please note that this solution assumes that the retail or F&B provider will provide one or more counters fully dedicated to fulfil requirements registered by the assistances).

As part of the project design phase we will define an interface (or use an existing one) that will allow us to receive information on goods on sell by each provider (F&B or retails), and to submit new orders to be handled.

Also as part of the project design phase, we will agree with IMG Theme Park on the user interface and layouts for this application

The following diagram presents a high level functional overview focusing only the queue buster solution.



Please consider that the above diagram just presents some more details on the queue buster solution, it will be fully integrated on the full solution and therefore share all the base hardware and software.

3.3.5. Partner Sales Portal

The partner sales portal will be provided as a web application, developed using responsive user interface, making it usable in different device form factors (like tablets and smartphones).

The partner sales portal will allow IMG to define a set of products and establish a limit for each partner to sell.

Products available on the partner sales portal can be park tickets, F&B or retail vouchers, or bundles including both park tickets and F&B or retail vouchers.

For each available product IMG will be allowed to configure the quantity each partner can sell per day.

The Partners Portal will integrate with IMG ERP to register sales and with the ticketing system to allow partners to print purchased tickets.

For F&B and retail vouchers, the partner's sale portal will generate a PDF voucher, including a QR Code or Bar Code that end customer will use to redeem their vouchers.

The partner sales portal will also allow IMG to define available payment methods per customer, specifying if they need to pay on purchase or by IMG invoice.

3.3.6. KIOSKS APP

This component refers to the dedicated application targeting the interactive kiosks. This application will leverage on as much functionalities as possible from the mobile app, but will have its user interface adjusted for a larger and non-personal device.

Please note that while the final feature set for this application is only going to be defined during the project design phase, the proposed kiosks app will provide all the features identified on the request for proposal

The proposed kiosks hardware runs Microsoft Windows 10, therefore this application will be developed using Microsoft .NET and target that OS.

Please note the both Kiosk applications will support multiple languages. As part of the services included in this proposal, we will provide both Arabic and English translations. Additional languages can be added just by changing the configuration and providing language files.

In case IMG Theme Park wants to provide additional languages, we can either perform the translations and testing (not included in this proposal) or just configure the kiosks for the requested additional languages given the translation files to be provided by IMG Theme Park.

Information Kiosks

Information kiosks will host an application that will closely resemble the functionalities provided in the smartphone application. Nevertheless it will target an anonymous usage, meaning that none of the features connected with user profiling will be deployed. The following list presents features to be provided in information kiosk (please note that this list will be further detailed and fine-tuned during the project design phase)

- Integrated 3D map of the park, with navigation capabilities;
- Access Park information, including View special events and schedules for the park;
- Menus and booking for in-park F&B outlets;
- Retail and F&B Order Ahead;
- Booking of FastPass for rides;
- View balance on IMG Cashless Wallet (requires that kiosk user to provide his cell phone number and to insert the wallet pin);
- View loyalty points and complete customer loyalty profile information

Unattended Ticketing Kiosks

Unattended ticketing kiosks while will host an application that will also closely resemble the look and feel of the smartphone application but targeting ticket sales and wallet top-ups, therefore demanding additional hardware (please note that the kiosk suggested on section 4.9.2 includes all the needed capabilities to receive and return money bills and to read and write RFID tags).

In detail unattended ticketing kiosks will allow visitors to buy tickets (see section 4.4.1 on more details on ticketing) using either money bills, credit/debit cards or the IMG cashless wallet.

Please note that we are suggesting the inclusion of a RFID reader/writer in unattended kiosk, which will allow easy payments using the cashless wallet and also to read id's from wristbands;

3.3.7. SERVICE BUS

The service bus (commonly referred as enterprise service bus) defines a system architecture model for communication between mutually interacting software applications in a SOA solution.

Service bus are emerging as a service-oriented infrastructure component that makes large-scale implementation of the SOA principles manageable in a heterogeneous world.

Typically, a business service or application relies on many other services in its implementation, and this services interact via the Enterprise Service Bus, which facilitates mediated interactions between service endpoints. The Service Bus supports event-based interactions as well as message exchange for service request handling.

By relying on such system component, the proposed solution will provide greater flexibility in terms of its integration with known or future third party services. IMG Theme Park will gain a truly SOA solution with all the advantages and flexibility of such solutions to adjust to changing business rules.

3.3.8. ETL SERVICES

Set of services that support ETL (extract, transform and load) flows. As part of the services included in this proposal we will provide a set of ETL flows that will gather data from several data sources, and store them in the analytical repository of the business intelligence platform. Such flows will rely on this ETL Services to execute any function on our system.

This services ensure that even for the ETL flows, no direct access is allowed to system support databases, ensuring our solution fully complies with a decoupled system architecture.

3.3.9. SECURITY SERVICES

Represents a composite system component than handles users authentication in either custom authentication mode or Facebook or google integrated authentication mode. This component also integrates with IMG Theme Park identity management systems to provide authentication to Partner Sales System App.

This component also handles user authorization, ensuring that personal data and a given set of services is only available to authorized users.

3.3.10. Business Services

Following the SOA approach, all functionalities needed to fully support all the front-end components will be available through services. Such services will be available over a custom REST API.

By deploying such layered solution, we ensure that the system fully adheres to decoupling best practices that ensure a longer life cycle while lowering TCO (in particular for costs of evolution and maintenance)

3.3.11. Integration Services

This component represents the set of services that will provide integration with third party systems (either hosted by IMG Theme Park or third party organizations). This services will provide an abstraction layer over the actual third party systems, allowing the solution to became more resilient over changes on this external system (in case a change occurs in third party systems, updates are needed only on integration services and not on all the provided solution).

3.3.12. Payment Services

Set of services that will allow the final solution to abstract the payment provider in use. An abstraction layer ensures that none of the internal components of the system is deeply bound to a given third party service. By doing so, we not only protect the system to changes in the payment gateway in use, by minimizing impacts on our system.

This approach will also make it easier to change payment gateway in use, making it a matter of integration configuration at the service bus level.

3.3.13. System Support Databases

All information needed for the system to operate will be stored in databases. This option ensures not only full data protection but also that the system adheres to high availability and disaster recovery needs.

3.3.14. Queue Management System

The queue management system will provide estimated wait times for the attractions on the park. As no dedicated hardware exists for this context, the system will take under consideration visitors standing in a given range of a selected beacon, cross this with the configured average number of visitors the attraction takes per minute.

In details, the management console will allow operators to configure:

- Associate one beacon with a given attraction.
- Queue counter range and in-range visitor's percentage. The given percentage of visitors standing inside the configured range will be considered as waiting in the queue. For example, if range is 5m and percentage is 80, this means that the system will consider 80% of the visitors in a 5m range of the beacon as the ones waiting in the queue.
- The average number of visitors served by the attraction per minute

The estimated wait time for any given attraction will be given by the following equation:

$$waiting\ time = \frac{visitors\ in\ rage * counter\ percentage}{average\ served\ visitors\ per\ minute}$$

Please note that the proposed algorithm for wait time calculation shall be adjusted during the project design phase, and that we are also available to implement different options for waiting time estimation as long as they are considered equivalent in effort and other costs by our project team.

3.3.15. Asset Tracking System

The asset tracking system will allow park operators to locate any given asset inside the park area. To allow for this to be implemented we will leverage on existing infrastructure for child tracking.

Park operators will associate an active RFID Tag with each asset they what to track and then use the management console to configure this tag.

After proper configuration, park operators will be allowed to use the management console to locate a given asset. The system will show the park map displaying the last known location of the asset.

The management console will provide a dedicated web form to register the asset data, and associate it with an RFID tag. Please note that the form will serve to collect, edit and view asset name and description and no other features will be available besides providing the asset localization.

3.3.16. Inventory Tracking System

As part of our solution we will provide IMG with simple inventory tracking system. The goal of such system component is to allow IMG to update its ERP system with inventory items location.

The proposed solution includes supplying portable barcode readers (see more detail on the hardware build of materials included latter), that operators will use get information on a given item (IMG will label items using barcode tags).

On reading of a barcode item, the personal reader will show information about the inventory item. This information will be collected from the ERP.

Additionally, the personal barcode reader will also allow the operator to update the inventory item location. By pressing a button, the current location will be uploaded and the inventory item location in the ERP updated.

3.3.17. ANTI-SHOPLIFTING SYSTEM

The anti-shoplifting system aims to prevent sales loss from shoplifting. In such all goods will be protected with RFID tags, and a pair of sensor barriers at shop entrances will detect if a given good is being taken without previous deactivation of its RFID tag.

As part of this project we will provide two sensor barrier pair and one tag deactivation device per park shop.

Sensor barriers allow consistent 2.5m (8ft 2in) global detection protecting critical assets. Optionally they can have embedded people-counting sensors to provide additional information on shop traffic and to calculate conversion rates and maximize store performance.

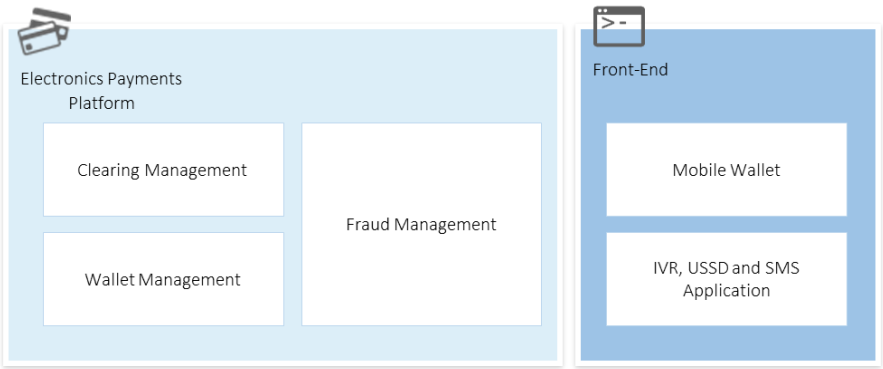
Optional Metal-Foil Detection alerts staff when foil-lined bags or clothing enter the store environment, helping combat shrink and ORC

3.3.18. ELECTRONIC PAYMENTS PLATFORM

The electronic payments platform will manage and ensure all the logic associated with the IMG Worlds of Adventure cashless wallet, the loyalty program and the interconnections between these two areas.

As part of our services we will integrate our front-end components (mobile app, wristband, kiosk application) with electronic payments platform, providing a fully unified and integrated system.

The following diagram provides a high level overview on the Electronic Platform Payment



The electronic payments platform is an autonomous system that we will integrate into the final solution. All the components from this platform will be deployed in the same hardware infrastructure as the remaining solution components.

Fraud Management

The fraud management component allows the configuration of payment limits per transaction, per day and per month. Such limits can be enforced for top-ups, top-downs and transfers.

By platform configuration is also possible to define a maximum value for transactions without pin, and the definition of time intervals between which transactions with the same merchant and value are considered duplicated and therefore denied.

Wallet Management

The wallet management component handles the jumbo account (sum of all wallets) and all individual wallet accounts. Each wallet is associated with a unique ID, which is used by front-end components to identify each end-user wallet.

At any moment in time the platform allows to access to both jumbo and individual wallet account statements.

Clearing

Clearing is the process that has as objective the daily establishment of the balances and movements, resulting of operations made in the network. Computed balances should then be reported to the participants.

Operations covered by Clearing

Clearing is the result of the processing of all transactions in the network, during a pre-defined period.

It covers, mainly, all operations executed in the several network access points, in accordance with the following table:

Access Point	Operations
IMG Theme Park front end components (Wallet; Kiosks; Service Centers)	Withdrawals, Inquiries, Payments, Transfers, Special Services, Cash-In, etc.
Retails shops and F&B	Purchases, Inquiries, Returns, Payments, etc.
International Payment System / Payment Gateway	Purchases, Balance Inquiries, Buy, Returns, Authorizations and Purchases after authorization

Information Exchanged

In each clearing process, the network management entity (IMG Theme Park), after receiving all the information with the day's operations, organizes it so that system participants are informed on the transactions that were involved and their compensation balances. Thus, the network management entity sends, at the end of each clearing closure, files to the participants.

In the files sent to the participants, it will inform:

- The operations processed by the network management entity, involving the electronic payments in its various aspects in view of the operations in question;
- Each supplier, relative to the impact that each file received from compensation had in the calculation of the respective compensation balance;

The provision of funds to the beneficiary of the transactions processed in the system, by the respective Bank, should be effective within the timetable that will be defined (following local payment system regulations) and is not included as part of the clearing process.

Schedule

The closing of each clearing takes place at the end of each calendar day in the schedule established by the management network entity (IMG Theme Park).

Clearing vs “Real-Time” Processing

Although the system provides information from transactions by the Real-Time Protocol, valid amounts are the ones included in clearing files. In addition, despite acting on the value received in Real-Time messages one should always implement a mechanism for controlling the amounts reported via Destination file (DTS5) are the same as those received via Real-Time. Meaning that it cannot just ignore these records, as already dealt with via Real-Time, one should always cross the information.

In case of difference in amounts between Real-Time and destination files, information from compensation files should always be considered.

(Example: transactions which for some reason are cancelled. In DST5 are informed pairs of transactions that cancel each other, the annulment may not have followed via RT being given messages with lower priority).

Automated Clearing

Upon correct configuration solution proposed solution allows for automated clearing, meaning that for a pre-defined schedule it automatically generates the related information for all participants in the operations.

Files Generated (non-exhaustive list, example of core files):

File Name	Description
DT5	Operation Destinations
MOV5	Movements
ORI5	Operations Origins
CLN5	Captures File and Black List
MEPS	Service Payments Movements
RMB5	Compensation Summary

Manual Inquiry

The management console will allow authorized users to list the information derived from the preliminary analysis of the data that will give rise to compensation files.

From this panel one can perform the functionality “Validation Preview”, regardless of being parameterized to run in early compensation.

3.4. SUPPORTED TRANSACTIONAL SERVICES

The following section presents solution supported transactional services. Please note that this is early stage information, based on the request for proposal documentation, and will be further detailed and adjusted during the project design phase.

3.4.1. TICKET QUERYING AND ONLINE/MOBILE TICKETING

The system will be connected to the existing ticketing system for the IMG Worlds of Adventure, allowing application users (and partners or external systems) to get access on available tickets and also perform the acquisition of tickets. Proposed system will support different ticket types, covering for instance multiday, or VIP tickets.

All ticketing functionalities will be available over the mobile app, the partner’s sales system application and over the park kiosks. For propose of this system, we are assuming that the current ticketing system supports issuing ticket codes (reference number, bar code or QR code). Such codes will be stored over the customer mobile device to be presented at gate controls (optionally in case of a reference number it can also be delivered by SMS).

Wristbands as Access Token

As part of a set optional features that can enhance visitor's experience, we are suggesting the usage of wristbands as access tokens for all visitors (please check for more information latter on this document).

The information provided next is considered as a draft description on the functionalities to implement. Full details will be defined during the project design phase, ensuring that the final solution is fully aligned with IMG Theme Park requirements.

Mobile and online ticketing in such scenario will then be made of two different use cases. Visitors will be allowed to buy the tickets using the mobile application or the kiosks, receiving a ticket token on success. After that, at the access gates, they will exchange their tokens by park wristbands. Returning visitors (they already have the wristband), will be able to purchase the ticket specifying the wristband ID (to be printed in the interior part of the device), being able to use it without any additional procedure.

Please note that our system will control which ticket is associated with each wristband. To validate the ticket/wristbands, access gates will need to have NFC readers, and the control system will access exposed API's to validate and dispose the visitor's ticket. The current proposal does not include this integration between the access gate system and our system, if needed we can provide both the required services and hardware.

3.4.2. RETAIL PAYMENTS

The proposed solution supports three different use cases for customer to business payments. Please note that all proposed use cases will demand updates over retailer POS systems.

Ticketless Payment

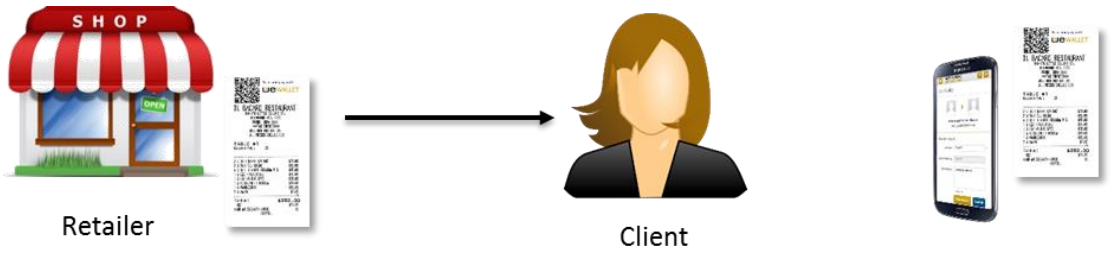
In this scenario, retailers will use a dedicated API to request for payments by using the client mobile phone number. The retailer will provide the system the client phone number, the value to charge and a small description. In few seconds, the client will get a notification on his smartphone application, asking for authorization to perform the payment.

On acceptance, the application will drive the customer to the payments screen where he will chose the payment method (credit/debit card, or cashless wallet), and provide his security pin. On success, the system will notify the retailer that can then deliver the gods or services.

Please note that the proposed solution doesn't include any electronics payment terminal (nevertheless if needed we can provide such devices), and payment by using credit/debit card will rely on the MIGS 3DS Payment Gateway.

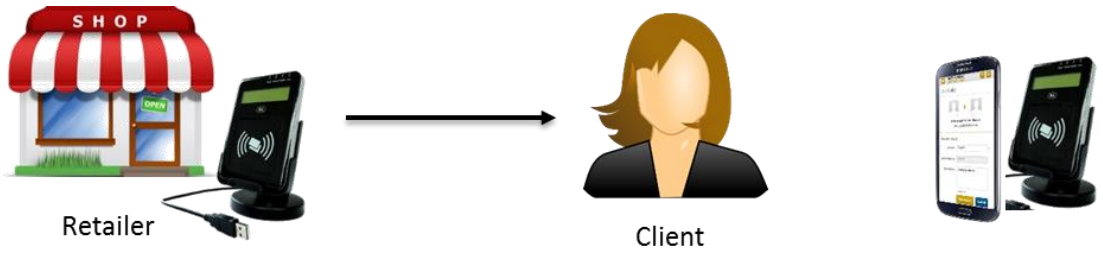
Retail Ticket Payment

In this case, the retailer will issue a ticket containing a QR Code (the code will be provided by our system through one of the available APIS's). The customer will then use the IMG Worlds of Adventure smartphone application and by scanning the QR Code he will be directed to the application payment screen where he will chose the payment method (credit/debit card, or cashless wallet), and provide his security pin. On success, the system will notify the retailer that can then deliver the gods or services.



NFC Payment

The NFC based payment if the simpler one from the customer perspective, as it will only need to get his device near to the payments pad and will be directed to the application payment screen where he will chose the payment method (credit/debit card, or cashless wallet), and provide his security pin. On success, the system will notify the retailer that can then deliver the gods or services.



3.4.3. ACCOUNT MANAGEMENT

The proposed solution assumes account management to be the ability for users to manage their personal information. In this case, it will support fully support this service, allowing visitors to fully customize their personal information, like for instance the profile pictures.

On the management of the cashless wallet, users will be change the security pin, define the allowed to limit for payments and the maximum value they will be granted to pay without the need to provide the security pin.

Please note that we are proposing the system to collect visitor's usage information, creating a unique visitor profile. This information will be used to increase the users experience by provided the best content and highlights for each user.

3.4.4. WALLET TOP-UP

Top-up is the way of transferring money to the IMG cashless Wallet (it can be done using real cash or credit cards). The system will provide four easy ways to do this:

Option One

Visitors can go to a park unattended ticketing kiosk and follow the instructions provided to them for topping-up their wallets either using a debit/credit card or money bills.

Option Two

Transfer money from their credit/debit card to their wallet. Visitors will use the smartphone application and follow the instructions provided to them.

Option Three

Transfer money using MasterPass (as part of the services provided in this proposal we will integrate our system with MasterPass using the provided API's). Visitors will use the smartphone application and follow the instructions provided to them.

Option Four

Visitors can go to park customer care center, and deliver money to be transferred to their wallet. Customer care agents will use the provided management console to transfer the funds to the user wallet (users will be notified of their new balance right after the agent completes the process).

Please note that this is an optional top-up method and it will depend on IMG Theme Park will to provide such services to visitors, nevertheless the proposed solution is capable to support this scenario.

3.4.5. CASH-OUT

The system will provided visitors with a way to withdraw money from their IMG cashless wallet, in two different ways:

Option One

Using park unattended ticketing kiosks and follow the on-screen instructions to easily and instantly cash out money from their wallet.

Option Two

Visitors can go to park customer care center, and request money to be withdrawn from their wallet. Customer care agents will use the provided management console to withdraw the funds from the user wallet and deliver them the money.

Please note that this is an optional top-up method and it will depend on IMG Theme Park will to provide such services to visitors, nevertheless the proposed solution is capable to support this scenario.

3.4.6. CASH-IN AND CASH-OUT STATEMENTS

Both cash-in and cash-out operations (visitors deliver or receive money from the park kiosks or service centers) will be fully logged and auditable. The system will also provide statement reports that provide the list of all movements, including wallet identification and channel identification (kiosk id or service center attendant id).

On successful completion of the operation, both the management console and unattended kiosks will deliver a recipe containing information on the transaction. This recipe should be deliver to the customer as proof of transaction.

3.4.7. BALANCE INQUIRY

As presented earlier, the smartphone application will allow users to get information on their cashless wallets. Among other functionalities, users will be allowed to check their current statement, including current balance and list of movements.

3.4.8. WALLET-WALLET TRANSFER

Besides supporting payments in retail shops the proposed solution will also allow IMG cashless wallet owners to transfer money between themselves.

The following diagram explains the proposed procedure to perform wallet to wallet transfers. Please consider that during the project design phase we will detail this procedures together with IMG Theme Park project members, and adjust them to meet requirements and expectations.

3.5. TECHNICAL SOLUTION

This section provides detailed information on the proposed technical solution, including the recommended support infrastructure. Please note that we selected a set of open source components with proven value in similar scenarios that ensure a low TCO for this solution. Nevertheless if this technologies are not aligned with the current IT strategy of the IMG Theme Park, we will adjust the proposed solution (for instance using Microsoft base technologies).

The following diagram shows the instantiations of base software on each of the functional components presented above.

3.5.1. MOBILE DEVELOPMENT PLATFORM

Application development has been evolving at a sustainable and growing rate, mostly due to the massive consumer dive into mobility. Multiple carriers, devices and software have all gained their own niche into the daily lives of people all over the world. Every day we all get more and more dependent on mobile devices to complete several of our daily personal and professional duties.

This new context created a huge opportunity for businesses and mobile application developers to strengthen their presence as promoters and facilitators of the mobile revolution. In the world of mobile applications, it is no secret, that native applications warrant no debate. Their advantages greatly overwhelm those of hybrid or HTML5 apps.

Nevertheless of the advantages of native application over hybrid or HTML5 alternatives, the truth is that developing and maintaining different code bases to natively support distinct mobile platforms, deeply increases the TCO, and can ultimately deem initiatives to failure by the costs of ensuring proper mobile application evolution. This is where Xamarin and its unique approach gains its space over other mobile development platforms. It provides the advantages of native UI, access to specific-device features, and most importantly, native performance. Code sharing across platforms is a breeze with Xamarin, helping to shorten development cycle, and of course posing a decisive contribution to reduce system TCO.

Taking a closer look over the requirements for the IMG Worlds of Adventure mobile application, we decided to leverage on the advantages of multiple platforms and code sharing of Xamarin, by doing so it's possible to reduce the project implementation and maintenance costs, while maintaining the full capabilities to explore all the advanced features provided by the hardware.

The 'Wikitude SDK' is a software library and framework for mobile apps used to create augmented reality experiences. The SDK supports any kind of location based use case as well as use cases which require image recognition and tracking technology (vision based augmented reality). With this proposal we will integrate 'Wikitude SDK' on the IMG Worlds of Adventure application which will enforce the solution with all the required AR features plus adding the flexibility to achieve any future AR requirement.

3.5.2. SUPPORT SOFTWARE

The following chapters of this proposal detail each of this software components. Please consider that we will be able to consider changes in the selected components to ensure full alignment of the final solution with IMG Theme Park requirements and technical constraints.

Source Code Management (GitLab)

GitLab includes git repository management, code reviews, issue tracking, wikis and much more. GitLab comes with GitLab CI, an easy to use continuous integration and deployment tool.

GitLab allows development, testing and management teams to discuss issues and plan milestones. Do code reviews and make line comments.

GitLab has integrations for tons of tools such as Slack, Hipchat, LDAP, JIRA, Jenkins, many types of hooks and a complete API. GitLab runs smoothly on a tiny server but can scale to multiple active servers. A single server handles more than 25,000 users.

As part of the current proposal we will deploy GitLab Community Edition on IMG Theme Park infrastructure, optionally this component can be hosted in virtual machines running on cloud infrastructure or any other cloud provider infrastructure. Please note that GitLab also provides a SaaS alternative.

GitLab community edition is free and open source. It is built by a community of more than 700 people. Also available is the enterprise edition which comes with a subscription and offers deeper LDAP / AD integration, Jira and Jenkins integration and much more.

Web and Application Server (IIS)

Internet Information Services (IIS) for Windows® Server is a flexible, secure and manageable Web server for hosting anything on the Web. From media streaming to web applications, IIS's scalable and open architecture is ready to handle the most demanding tasks.

IIS has a modular architecture. Modules, also called extensions, can be added or removed individually so that only modules required for specific functionality have to be installed. IIS includes native modules as part of the full installation. These modules are individual features that the server uses to process requests and include the following:

- Security modules: Used to perform many tasks related to security in the request-processing pipeline, such as specifying authentication schemes, performing URL authorization, and filtering requests.
- Content modules: Used to perform tasks related to content in the request-processing pipeline, such as processing requests for static files, returning a default page when a client does not specify a resource in a request, and listing the contents of a directory.
- Compression modules: Used to perform tasks related to compression in the request-processing pipeline, such as compressing responses, applying Gzip compression transfer coding to responses, and performing pre-compression of static content.

- Caching modules: Used to perform tasks related to caching in the request-processing pipeline, such as storing processed information in memory on the server and using cached content in subsequent requests for the same resource.
- Logging and Diagnostics modules: Used to perform tasks related to logging and diagnostics in the request-processing pipeline, such as passing information and processing status to HTTP. sys for logging, reporting events, and tracking requests currently executing in worker processes.

IIS fully supports ASP.net 4.5 and offers several configuration options for running it side-by-side with ASP.net 3.5.

IIS has been improved version over version, and currently version 8 offers several improvements related to performance in large-scale scenarios, such as those used by commercial hosting providers and Microsoft's own cloud offerings. It also has several added features related to logging and troubleshooting.

Database Management System (SQL Server)

Microsoft SQL Server is a relational database management system developed by Microsoft. As a database server, it is a software product with the primary function of storing and retrieving data as requested by other software applications which may run either on the same computer or on another computer across a network (including the Internet).

Breakthrough, in-memory performance

With SQL Server 2014, new in-memory capabilities for transaction processing and enhancements for data warehousing complement our existing technologies for data warehousing and analytics. Scale and transform your business with up to 30x performance gain for transaction processing using existing hardware, and a greater-than 100x performance gain for data warehousing.

Proven, predictable performance

SQL Server consistently leads in TPC-E, TPC-H and real-world application performance benchmarks. SQL Server is SAP-certified to run some of the most demanding workloads. Get more predictable performance of virtualized SQL Server instances with IO governance in Resource Governor.

High availability and disaster recovery

Gain mission critical uptime, fast failover, improved manageability, and better use of hardware resources through enhanced AlwaysOn in SQL Server 2014, a unified solution for high availability. In SQL Server 2014, setting up AlwaysOn becomes even easier with new Add Replica wizard and if you are looking to implement hybrid HA using Microsoft Azure Virtual Machines you can take advantage of new AlwaysOn templates to automate HA setup.

Enterprise scalability across compute, networking, and storage

With SQL Server and Windows Server, physical processing now scales up to 640 logical processors, and virtual machines scale up to 64 logical processors. SQL Server also utilizes storage spaces and network virtualization to optimize your resources. It can also run on Windows Server Core to lower the surface area of attack.

Security and compliance

Help secure data for mission critical workloads with transparent data encryption, robust auditing, extensible key management and encrypted backups. It is even easier to manage permissions for data access to support separation of duties across various users.

Consistent data platform on-premises to cloud

Leverage existing skills and familiar tools like Active Directory and SQL Server Management Studio across on-premises SQL Server and Microsoft Azure. Have the flexibility to run your SQL Server workloads in Azure Virtual Machines (VM), giving you complete control of the VM. Or use Azure SQL Database service to further simplify the need to manage your SQL Server instances while providing unique scale-out architecture.

Corporate business intelligence

Scale your BI models, enrich and help secure your data, and ensure quality and accuracy with a complete BI solution. Build comprehensive, enterprise-scale analytic solutions with Analysis Services and simplify BI model deployment with the BI Semantic Model.

Access data in familiar tools like Excel

Accelerate time-to-insight using Microsoft Excel. Search, access, and shape internal, external, structured, and unstructured data for analysis in Excel.

Faster insights for all users with Power BI

Accelerate time-to-insight, on-premises and in the cloud with SQL Server 2014 and Power BI. Get richer visualizations using Power Map and Power View. Search, access, and shape internal, external, structured, and unstructured data with Power Query. Access insights from anywhere using Power BI.

Scalable data warehousing

Scale to petabytes of data for enterprise-grade relational data warehousing using scale out Massive Parallel Processing (MPP) architecture using the Analytics Platform System (APS) and have the ability to integrate with non-relational sources like Hadoop. Support your needs from smaller datamarts to your largest enterprise data warehouses while improving queries by more than 100x faster than your legacy data platform and reduce storage with new enhanced data compression.

Data quality and integration services

Integration services includes rich support for extract, transact and load (ETL) tasks, and the ability to run and manage as a separate SQL Server instance. Improve data quality by using organizational knowledge and third-party data providers to cleanse data through Data Quality Services.

Easy-to-use management tools

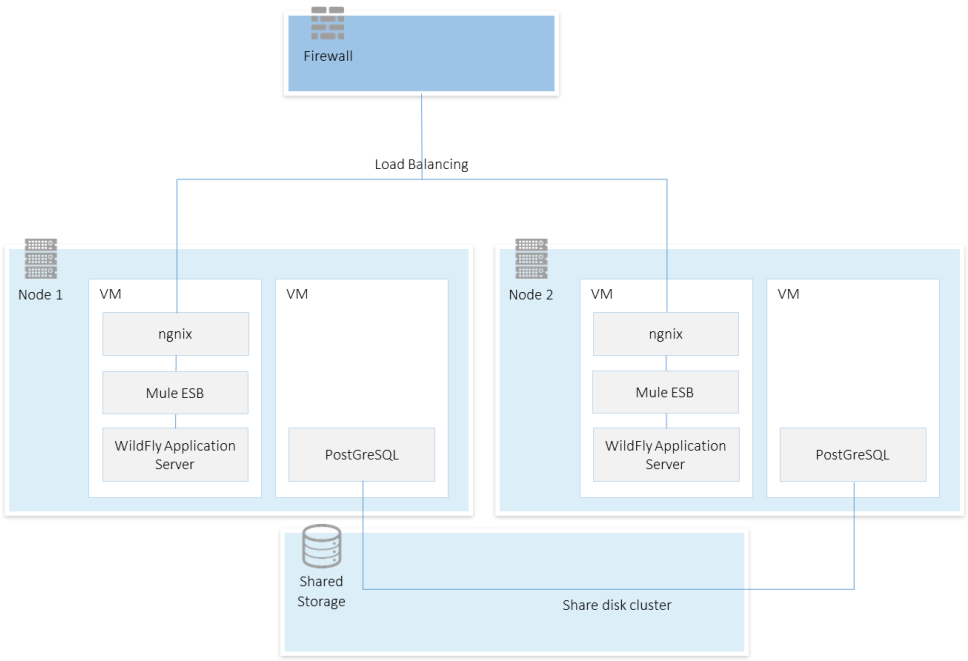
SQL Server Management Studio helps you centrally manage your database infrastructure both on-premises and in the cloud. Added support for Windows PowerShell 2.0 automates management tasks and enhancements to Sys Prep let you more efficiently create virtual machines. Simplify application testing on a single database using Distributed Replay.

Robust development tools

Updated developer tools are integrated into Visual Studio and are available for download to build next-generation web, enterprise, business intelligence and mobile applications across on-premises and cloud. Customers can use industry standard APIs (ADO.NET, ODBC, JDBC, PDO, and ADO) across varied platforms including .NET, C/C++, Java, Linux, and PHP.

3.6. SUPPORT HARDWARE INFRASTRUCTURE

The following diagram presents a high level overview on the support physical infrastructure (please note that for simplicity some network elements are not included in the diagram).



We strongly recommend to deploy a virtualized infrastructure composed by at least two physical nodes, hosting four virtual machines.

Two of the virtual machines will host Microsoft SQL Server in a cluster, providing redundancy at the database level, ensuring high availability levels.

The other two virtual machines, will host a farm of HTTP server that will fulfill client requests (Smart Travel App and Management Console), the service bus and a farm of application servers that will host all the services implementing the system business logic.

Please note that the system will be developed in such a way that the services deployed in each of this virtual machines can be deployed independently. This will provide greater control in the available system scaling possibilities, allowing for instance the deployment of independent http server or application server farms, or service bus clusters.

The following tables present the build of materials for the recommended hardware support infrastructure. Please note that supplying, installing and configuring all this hardware is considered as optional, and therefore all prices are presented separately.

3.7. CHILDREN WRISTBAND

The children wristband is a wearable that contains an active RFID tag, and allows the solution to provide child tracking and low value cashless payments. Our proposal is to allow the following features for children's wearing the device:

- Child Tracking – Allowing parents or park management to locate any children inside the park that is using the wristband;
- Low value payments – By using the smart phone application users will be allowed to transfer small amounts of money to a given wristband. After that owner of the device will be able to use the transferred money to make payments inside the park area;

The following image presents an early stage proposal for the IMG World of Adventures wristband. Objective is to provide an appealing device that will then be used by children's outside the park, being by that a way to promote the park among the general population.

Please note that final price for the wristband will deeply depend on the number of devices ordered and on the provided features. Nevertheless estimations are for device costs to be between 2 and 8 euros.

3.8. Optional Components

The following section presents a set of optional components from our Big Events offer. These components were included because we are truly convinced that they significantly increase our offer value, and they are aligned with the goal to increase visitors experience and management over the Park.

Pease note that in certain scenarios it's not possible to quote this optional services as before that it's needed to fine tune and close the scope of such solutions. Nevertheless we included them to allow IMG Theme Park to understand our expertise in this area, and to show we are fully committed with this initiative and with its overall success.

3.8.1. People Tracker

The people tracker solution is a way to broaden the range of the included child tracking solution. In this case our proposal is to make the wristband widely available to all visitors (it shall be considered to make it act as the park ticket).

In this context, the people tracker solution will allow everyone to be tracked inside the park area and the smartphone app would then be allowed to provide for all visitors the same features that are

included in the child tracking module, like for instance notify a user if one of his friends from a social network is close to him.

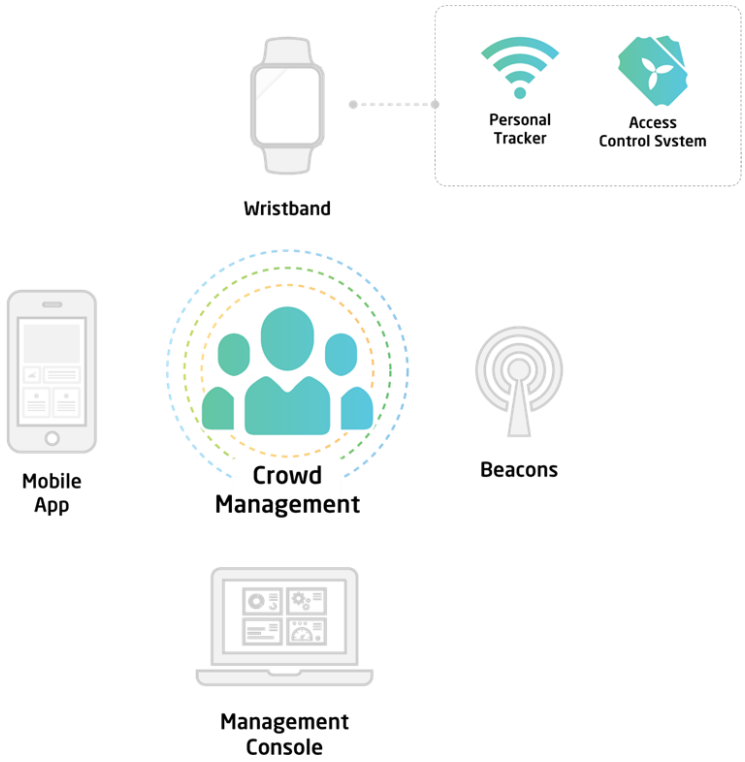
3.8.2. CROWD MANAGEMENT

Crowd management means providing a safe and organized setting for visitors entering your venue. This is of high importance when you open the doors to your park. The best way to manage crowds is in fact to avoid them, and in this activities advanced computer system play a decisive role.

Our crowd management solution aims to increase the monitoring and control over park operations, being it major goal to provide the need tools to detect and avoid getting crowded areas inside the park.

Our proposal is to use the information provided by the universal wristband and combine it with information gathered from visitors with the park mobile app. By using the information on the location of each of the visitors it's possible to present heat maps for the park operations personal. Based on this information management can dispatch agents to the area, or deploy other strategies (like just-in-time promotion of other park areas) to drive people away from the crowded area.

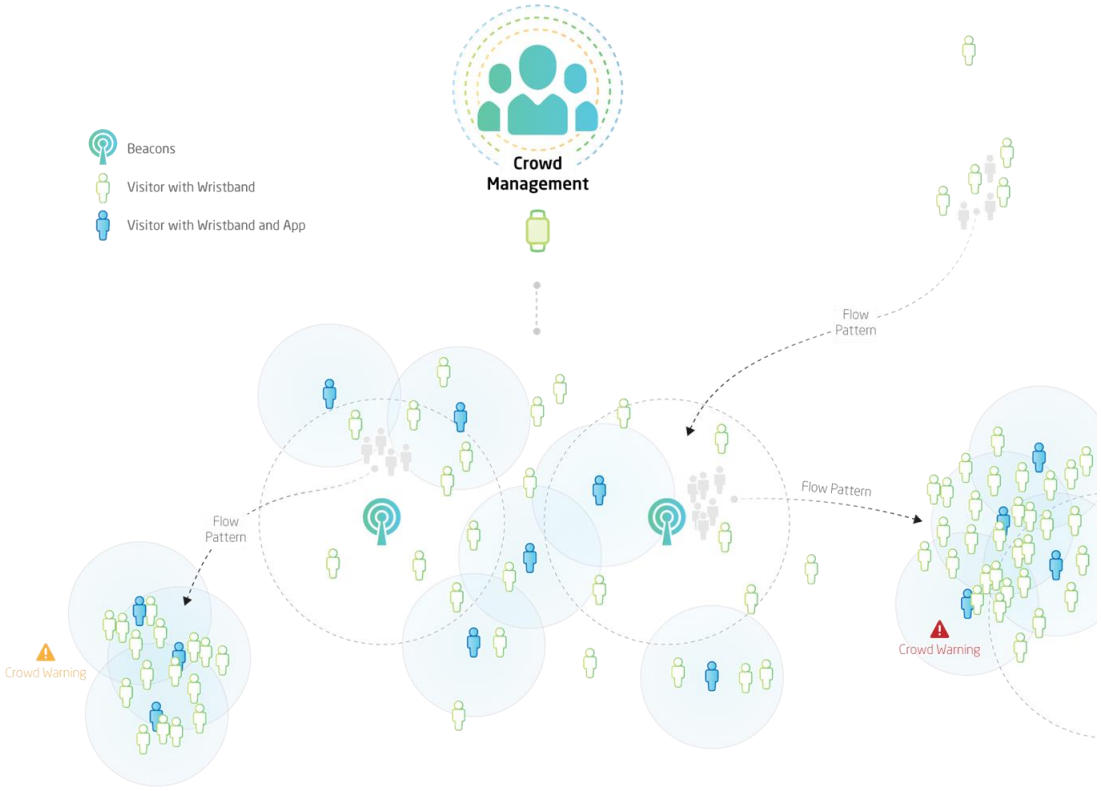
The following image provides a high level diagram over our crowd management solution and the integration between the several systems



Expected results from the crowd management solution are the availability of a set of dashboards providing heat maps. Such dashboards can also be configured to issue alerts on given thresholds (number of visitors per square foot).

The information collected by the crowd management solution will also be structured so that it can be used for data analysis. This information will help IMG Theme Park personal on deciding over updates to be performed to the park.

Additionally the crowd management solution will also allow park operators to discover and understand the flows of visitors inside the park area. This information can be highly valuable by combining it with marketing and cross selling strategies.



3.8.3. SOCIAL MEDIA MONITORING

Regular media, such as radio, television, newspapers, and increasingly easily accessible Web news, reach large audiences and are an important factor to consider in venues that are generally accessible to the public. These broadcasting tools have a significant influence in the public, and typically shape public opinion and sentiments. Such a powerful tool is difficult to neglect: awareness of what happens in the media world is a definite step for informed action. Also, in a world of rapid change, where relatively inexpensive and widely accessible tools that enable anyone to publish and access information, collaborate and build relationships, commonly named as Social Media, individual opinions do matter more than ever, and being aware of them is increasingly important.

For all these reasons, monitoring all the available existent media and analyzing provides powerful material to ignore. An effective solution capable of classifying such a large amount of data and deliver it filtered for human action is invaluable and adding a team specially trained to act with the right information will definitely be capable of positively affecting the visitors sentiment.

This optional component addresses all these points. All this information is analysed to provide insights such as sentiments and satisfaction. The platform also offers capabilities of automated classification, filtering and prioritization of news and posts, that can be then addressed appropriately. On top of the technological solution, we propose to leverage on our past experience in customer services, and provide a team of skilled professionals that will handle all the required interaction with the public regarding all the relevant issues that will occur in social media.

3.8.4. EXTENDED GAMIFICATION

We have vast experiences on providing marketing and promotion strategies based on games. Our proposal for IMG Worlds of Adventure is to develop a set of 3 to 5 mini-games that would them be integrated into the smart phone application.

One of the major advantages on deploying a gamification strategy, is the power it will give IMG Worlds of Adventure park managers. Games can be mixed with real live, giving park manager the ability to redirect crows, increase usage of certain park diversions and of course explore cross-selling opportunities.

There are many ideas to explore in the gamification strategy, which will mix the real and virtual worlds, increasing and prolonging visitors experience and awareness over IMG Theme Park brand. All these ideas need to be combined in a solid and global gamification strategy and can go for instance to awarding discounts or VIP passes to players that achieve a given level or score in a game, to advertising in park video walls when the player with the highest score in a given games enters the park, or to demand visitors to go through a certain activity in the real world to allow them to progress to a new level in a game.

Please note that games and gamification strategy can also be enhanced by the augmented reality solution.

3.8.5. VIRTUAL TOURS

Virtual tours are a great way to showcase any place or space. True virtual tours, add new dimensions to photos and enable viewers to explore a location as if they were really there. Our virtual tours solution include photographs, interactive maps, comments, and hotspots.

There are various reasons why adding a virtual tour can improve business. In general these benefits rely on the fact that 360 degree panoramic photography greatly enhances location and product understanding and improves marketing through visualisation.

Potential visitors can view the park in a much better way than through traditional photography. Because a virtual tour makes a location easier to understand, it's also a way to make the IMG Worlds of Adventure Park more attractive to the ones considering to visit it.

The virtual tours solution will also increase the penetration rate on travellers. It is proven that 73% of the people who research their holiday online visit two or more websites before deciding on where to go and on what to visit. When your website provides these potential visitors with good visualization, the customer can form a better and faster decision.

Statistics and studies corroborate the advantages on having virtual tours solutions. Studies show that almost 75% of potential event and venue visitors stated that they preferred interactive Virtual Tours over normal photographs. Also 80% of the people that shopped online and were interviewed say that photographic images are very important to form a decision to buy a product or service. Finally and also important is to consider that visitors to a website that features a virtual tour stay generally tree times longer on that website.

Virtual tours also increase the mouth to mouth advertising, as the park will get more exposure online People are more likely to visit the park website again just to experience the virtual immersive effect and enjoy the views. This will increase the chances that website visitors will refer the virtual experience to family and friends, therefore increasing awareness over the IMG Worlds of Adventure Park.

3.8.6. AUGMENTED REALITY SOLUTION

Augmented Reality is set to revolutionize the mobile user experience as did gesture and touch in mobile phones. It redefines the mobile user experience for the next generation making mobile search invisible and reduce search effort for users. Augmented Reality improves mobile usability by acting as the interface itself, requiring little interaction.

The augmented reality solution for the IMG World of Adventures Park is to be an add-on to the smartphone application that will allow visitors to point their smartphones to given park zones and get information and interact with what they are seeing (like park diversions and restaurants). Additionally the solution will also integrate with people tracking information and social networks, and show were a given visitors friends are in real time.

The augmented reality solution should also be integrated with the gamification strategy, allowing de deployment of real life immersive games where for instance visitors will have to point out their phone to a given park area and find a cartoon hero.

At this early stage of the process we are not able to provide a quote for the augmented reality solution, because we need to agree on a given scope for this solution. We decided to include this has optional and extension item for our proposal, taking under consideration our past experience in similar solutions and our understanding that such systems will allow IMG Theme Park to achieve their goals of getting a deeper engagement with visitors and increasing brand awareness.

In the event that IMG Theme Park decides to explore this solution, we will be available to work together on the definition of the final solution scope, and after that on quoting the system development.

3.9. BUILD OF MATERIALS

The following table presents the build of materials for the hardware and software parts included in the proposed solution.

Description	Quantity
AxRail appliance 120 with 4 nodes each with Dual Intel Xeon E5-2620 v3 2.4 GHz **2 nodes for Production, 2 nodes for tests and development**	
2 C13 PWRCORDS W/ BSI 1363 250V 10A	2
HCIA CHASSIS W/ 1600 PS AND FAN	1
HCIA DISK PACK 1X800GB SSD 5X1.2TB HDD	4
HCIA FIELD INSTALL KIT 10GE SFP+	1
HCIA ND 12COR CPU 128GBMEM 10GE SFP+ VLP	4
HCIA MANAGER SOFTWARE =MA	1
Software	
RECOVERPOINT FOR HCIA	1
RECOVERPOINT FOR VM FOR HCIA =IB	1
HCIA SOFTWARE	1

HCIA SOFTWARE VLP =IB	1
SQLSvrEntCore 2014 SNGL OLP 2Lic C CoreLic	9
WinSvrStd 2012R2 SNGL OLP C 2Proc	14
Other Devices	
Wristband Stations (Active RFID Readers)	100
BLE Beacons	3000
Ticketing Kiosks (see details bellow)	17
Interactive Kiosks (see details bellow)	28
Anti-shoplifting kit (one tag deactivator and 2 sensor barriers)	46

3.9.1. KIOSKS

Regarding Kiosks our suggestion is to provide devices manufactured by Famaset (Wingsys brand) an awarded Portuguese interactive multimedia devices manufacturer with local presence at the UAE.

Created in Famalicão, Portugal, Famasete is a technology company with 20 years of existence and experience, leading the Portuguese market for the design and implementation of technology education projects. Since 2012, they started the internationalization process.

Famaset invests more than 20% of the annual budget on innovation and development, and for that, they created this family of products Wingsys and E-asy, developing products, brands, patents and new services to the market, particularly in the area of multi-touch and interactivity.

Genetically, Famasete works with partners from various business fields, in which they are present, cultivating partnerships with more than 15 years, such as Microsoft, HP, Epson, JP Inspired Learning, Bi-Bright, LG, Sony, Sanako and Intel, among others.

The following images shows the proposed device for the unattended ticketing kiosk, which will be equipped with all the add-ons needed to issue tickets and perform IMG Cashless wallet top ups using both credit or debit cards and money bills. Please note that as part of the services included in this proposal we will decorate the proposed kiosk making it IMG Worlds of Adventured branded.

In what concerns the unattended interactive kiosk our proposal is to also deploy Wingsys hardware, in detail one of the most advanced devices from this line of products, providing a 42” touch display.

The following image presents the proposed device for unattended interactive kiosks

Please note that both devices will run applications developed and customized with the IMG Worlds of Adventure branding, therefore ensuring complete binding between the Kiosks and the Park.

3.9.2. TECHNICAL SPECIFICATIONS

Find below the technical specifications for both kiosks. Please note that as agreed with IMG Theme Park 10 of the interactive kiosks will also have the Verifone UX line pinpad and card reader, providing support for ISO 1/2/3 and chip cards

Ticketing Kiosks

Intel Nuc I3, 120 Gb SSD, 8 GB Ram

Full HD 19” Touchscreen (10 touches)

Wifi, Ethernet 10/10/1000

80cm wide x 60cm depth and 167 cm tall and approximately 100kg

Windows 10

Smartpayout (input/output bills)

Smart Hopper (input/output coins)

NP2411 60mm printer

RFID Reader

Verifone UX line pinpad and card reader (supports ISO 1/2/3 and chip)

ADVERSTISING MODULE

Full HD 22" Display

PC Stick Intel Atom Quad Core Z3735F

2GB RAM

WiFi 802.11 b/g/n 2.4GHz, BT 4.0 BLE

Interactive Kiosk

Intel Nuc I3, 120 Gb SSD, 8 GB Ram

Full HD 42” Touchscreen (10 touches)

Wifi, Ethernet 10/10/1000

116cm wide x 60cm depth and 150 cm tall and approximately 100kg

Windows 10

RFID Reader

4. QUALITY ASSURANCE

4. QUALITY ASSURANCE

We are fully committed with the continuous improvement of our products and services quality from the customer's viewpoint. From the start our vision is focused in maintaining and increasing customers' satisfaction, reliability and trust. This vision reflects our belief that our most important goal is to became and remain a highly trusted partner for our customers.

We achieve higher quality levels by the continuous improvement of our software development and systems engineering processes, besides processes and methodologies we seek to embed quality in our values, our company culture, in the way we work.

Our approach to software development and engineering services is focused on achieving high quality levels and on bringing advantages of that to our customers, by delivering within budget, on time and following market best practices.

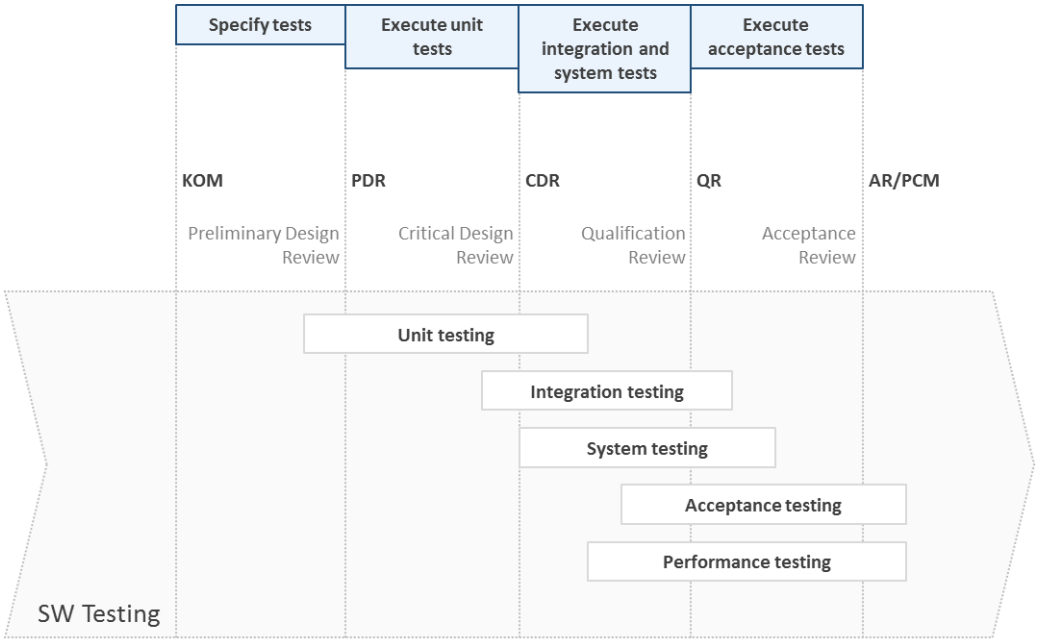
4.1. SYSTEM TESTING

The trust level on a given software component is ensured by the correct definition, planning and implementation of testing activities during the entire lifecycle of the system development.

To achieve the expected results from testing activities, decisions must be made on time to dedicate to testing, on the coverage level to be achieved, on the need documentation, etc.

Please consider that software testing will not eliminate defects, in fact this activity will result on the identification of current software defects, that them should be analyzed and fixed by the proper technical teams.

Our tests methodology combines a set of five different tests types (unit tests, integration tests, system tests, performance tests, and acceptance tests) which are executed in different phases of the system development lifecycle (please see diagram below). Roles and responsibilities for the execution of each of this tests are defined according with the system development lifecycle and its specific characteristics.



Executing software tests requires a set of inputs that will be different according to the test type and the system development lifecycle associated with the execution. Below it's a list of inputs that will be requested for the testing and quality assurance phase:

- Quality Assurance Plan;
- System Requirements Specification;
- System Architecture Specification;
- Source Code;
- Integrated Software;
- Configurations Management Plan and Software;
- User Documentation
- Plan and strategy for system releases;
- System Test Plan and Specification;
- Tests Environment;

As expected the execution of tests over a given software component will also produce a set of outputs. Once again these outputs will be different according to the executed tests type and the system development lifecycle associated with the execution.

Next we present a list of all outputs expected to be produced by the testing activities to be executed during the project:

- Tests strategy;
- Tests Plan;
- Test cases specification;
- Traceability matrix from system requirements to test cases;

- Test procedures definition;
- Test Scripts;
- Test Execution Reports;
- Project issues;