# Six steps to help you create successful mobile applications

With the help of modern mobile devices – smartphones and tablets – we can now perform a huge variety of tasks anytime, anywhere. Whether for business or personal use, once you go mobile you won't go back. The reason for this is the wealth of available applications (Apps) designed to help with virtually any task in ways that are convenient, simple and fun.

However, not all Apps live up to that promise; sometimes an App is used once and then quickly removed from the device. Why? Well, there are great Apps and then there are "the rest"!

Great Apps can be created only if the user's needs, the application's goals and the business requirements are clearly understood, and if user experience, design and architecture are properly selected and implemented. Great Apps don't just happen. Great Apps must be well planned. This document is a guide to help with planning your own great Apps.
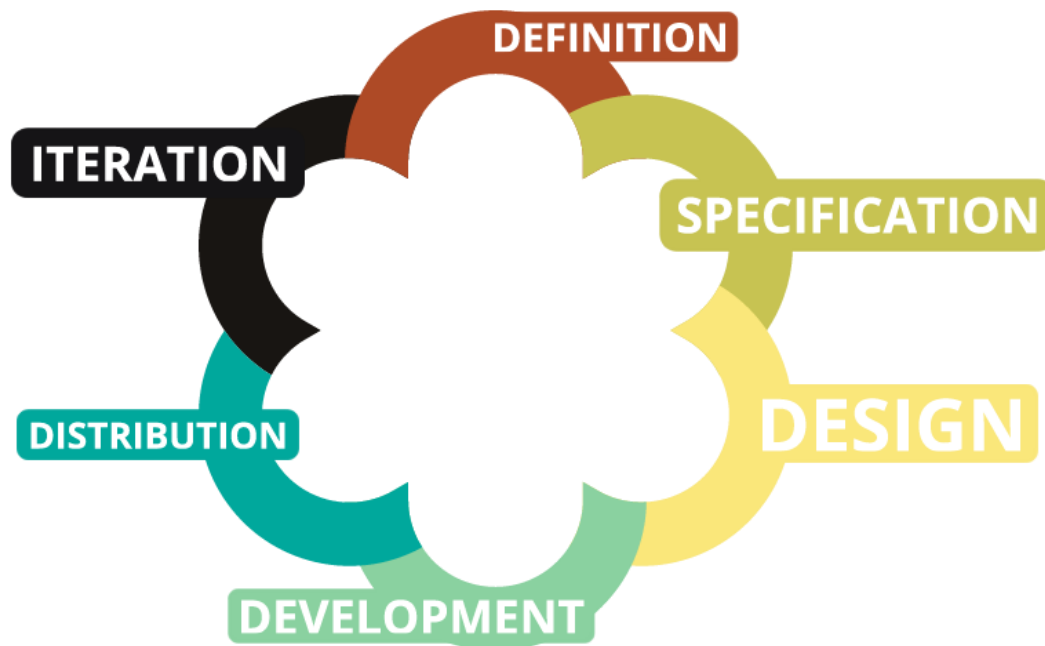
We at Mobile Consulting & Services International GmbH (MCSI) build useful apps that you will want to use again and again. As already mentioned, successful apps require detailed planning. Based on our experience this planning can be achieved by following these six steps:

1

Determine the opportunity and identify the parties involved

Mobile apps can be designed and used for a myriad of purposes, but only apps that solve real-world problems are genuinely useful. Our focus is on precisely such applications. Let's look at an example of a mobile solution to be created for employees of a company. The starting point is a Business Process Analysis (BPA).

When commencing a BPA the strategic question is: "Where in the company are there inefficient communications or time consuming processes which, if optimized, would generate real added value?"

For a logistics company with a large fleet of vehicles, the BPA might look like this:

Core process that can be improved:

Fleet Management: currently this is still handled by paper based route plans produced every day and individual vehicle log books manually updated by the drivers.

Added value through process optimization:

Connecting the driver in real time to the operation centre would allow continuous communication and route plan updates thus eliminating duplication of work and creating time and fuel savings. These are two of the main cost items for a logistics company.

Automated activity logging could not only minimize the error rate, but it would also result in further time savings.

Are additional benefits available using mobile device features?

The phone's camera or built in near field communication (NFC) for example can be used to automatically check out delivery goods (through barcode labels or NFC Tags). When combined with GPS location data, timestamps and check out data, an automated delivery confirmation can be produced. Taking that a stage further, a tracking system can be built which in turn will keep customers instantly informed about their shipments.

Who are the key people involved?

In this case, the key players are the ones from the operation centre (logistics control centre) and also the drivers in the field. Leaders of both parties should be involved in the project team.

How does the process work?

Operation centre and driver representatives will attend a kick-off workshop which we would set up and manage. At this meeting we will work together to generate ideas as to where and how processes and methods can be improved.

The following are some sample questions which may arise:

What tools are currently used in addition to the printed route plans for communication between vehicle fleet and operation centre? Which of these tools work well and which do not?

How the vehicle fleet and operation centre information is processed? Are route plans, conversations, delivery times, distances, etc. stored in a central corporate database? If so, how is this facilitated?

Who might use this database, and for what?

The answers to these and other questions will help to produce a list of requirements that will form the basis for the application development.

As soon these fundamental questions are answered we can continue to step two.

2

Define technical specifications and architecture

Apps may work offline, real time networked with enterprise applications, or as a combination of both. They may also make use of specific device capabilities such as camera, GPS etc. Individually these features are of limited use, so now we must look at how to combine the functionality available to us and leverage it into an optimal and integrated solution. During this step analyse the technicalities of how the features available can be put together in the most logical and efficient manner in order to meet the requirements defined in step one.

Let's look at the aforementioned logistics sample again. During the same workshop the solution scope will be drafted and the foundations for the later implementation will be built.

How can we facilitate core processes using mobile devices?

There are additional device capabilities such as a camera, GPS, NFC, etc. available. Can any of these be used individually or in combination to automate and streamline tasks and processes?

The finished app must be intuitive to use and has to guide the user through the process. At this point we want to arrange the individual processing steps into their most logical sequence.

What data is required and how does it flow?

Processes are driven by existing data and will also generate new data. In order to ensure a smooth data flow, a flow diagram including interface definitions will be created. This will define how we will communicate in re-

al time with any other applications involved and what technology to apply (e.g. JSON web services).

How will the app behave in circumstances where no internet connection is available? Does the app need to download data from the server in advance and cache it in case the device is offline when that particular data is required? Will new data which has been created whilst offline be stored temporarily on the mobile device to be uploaded automatically as soon as the internet connection is available again?

What application infrastructure is required and how is it managed?

Are additional IT infrastructure and/or cloud services required? How about Telecom services?

Do the current operations centre systems/ equipment/processes need to be modified or added to in order to integrate the app?

Are there any new skills required by staff? Any training needs must be identified.

Evaluate suitable mobile device(s) and technology:

E.g. is there a need for rugged, all-weather, heavy-duty devices or will standard smart phones and/or tablets suffice?

What minimum screen size and resolution is required? Do we need to compromise between the desired screen size and the portability of the device?

Do we specify one single target device for the app and design it specifically around the capabilities of that device or do we want to allow the employee to "bring your own device" (BYOD)? Choosing the latter may have far reaching consequences as it requires the company to support many different devices and operating systems. This considerably increases the complexity (and therefore cost) of a mobile strategy.

After clarification of the technical specification and architecture, we move on to step three:

3

Define User Interface and Graphic Design

A user's perception of an app and whether or not they enjoy using it is driven by the user interface. The design of the user interface needs to be clear, consistent, logical and simple. The interface needs not only to be specifically designed for touch screens, but must also consider the usage conventions of the selected platform. Android and iOS for example are different in operation, so the app must react appropriately to the user's actions based on the conventions of each supported platform.

Let's have a look at the [Challenge Earth](#) App. This app allows the user to search for and select outdoor activities such as hiking or biking and is a good example of the design principles we are discussing.

In a workshop we gathered a selection of sports enthusiasts - prospective future users, and defined the principles of the user interface based on their input. Building on this we then continued as follows:

Elaborate and test different user interface scenarios:

The interface should be designed to be fun to use based on the current 'gamification' trend.

The concept should take into account challenges, points, rankings, levels etc. The user will be rewarded for successfully completed challenges with achievements, success, status etc.

With wireframes or similar mock-ups we built test apps and played through different screen scenarios whilst always applying the following principles:

Reducing working steps to the absolute minimum

Implementing a logical step by step user guidance

Focus on the essentials and omit the unnecessary

Use fonts, colours, designs and image elements to create a unique and inspiring personality for the app:

Branding: how do we make the app's appearance instantly identifiable?

Efficiency: how are pictures and graphics to be kept small in size for faster loading?

Impact: how do we design a "WOW" effect? Colours, buttons, image flipping, sounds?

When this step is complete, you have a playful approach, a beautifully unique design and a user interface optimised for mobile devices, so now we can move on to step four.

4

Application coding and thorough testing

What has been defined in the requirements, technical specification, architecture and user interface design stages will now be transformed into a running application. During this phase the emphasis is on cooperation with the customer, quick replies to change requests and delivery of working software.

At first glance it might appear that this phase is solely the job of the software developers. However, in order to reach the goals of this phase the customer must also complete some tasks.

The following checkpoints are equally applicable to both consumer's and enterprise employee's apps.

For initial app testing and subsequent deployment and use it is usually necessary to implement some infrastructure changes/additions. It is therefore wise to go through a detailed planning exercise and check that any and all dependencies the app may have are properly catered for. Bear in mind also that the commissioning of hardware and software can sometimes take several months.

The following must all be taken into account:

Do we require telecom, IT infrastructure and or cloud services?

Are additional software licenses required?

Is specific test equipment required, barcode labels, NFC tags, etc.?

Do we need defined test procedures and user acceptance criteria?

Are there organizational changes involved? Will current processes be affected and therefore require changes?

As the app moves through testing and on to operation support; are the necessary human resources available and are the individuals aware of their tasks? (Vacation plans checked?)

At what intervals should development and test cycles to be carried out?

What should be documented and reported?

Step four can be repeated until all the objectives have been achieved.

5

Publish and promote App

Apps, depending on purpose, can be made publicly available or supplied to a closed user group such as employees of an enterprise.

It is also important to note that the procedure for native and hybrid apps versus mobile web solutions looks completely different (see discussion in the appendix).

We will support you in all cases with relevant and audience focused launch campaigns and advertising strategies. Depending on app focus – either end-users or corporate employees – one or the other of the following points will be considered:

Ensuring that human resources and infrastructure are ready on time:

When should the app go into production?

Are interfaces to external systems ready?

Are the server applications necessary to support the user interface up and running?

Is the app to be put on a download server? E.g. App Store or Google Play?

What about user support? Are support people trained and are they available if required?

Are release notes, system, user and marketing documentation all available?

How quickly can I get the largest possible user adoption and how do I measure success?

Are the app name, keywords and descriptions for the App Store ready?

How about drafting a press release? Shall the app be reviewed by the critics? Can the app be nominated for awards?

What is the social media marketing plan?

Should the app be promoted and if so how? (E.g. AdMob, iAd or AdWords or App directories?)

And now the fun starts! Your brand, products and services are now mobile and your employees more productive, all thanks to your useful new apps.

6

Plan further development and user support

We will also be here after the launch to support you. It is important to develop the app continuously. On the one hand, the range of mobile devices is very dynamic and fast moving. Several times per year, new devices are launched supporting even more features and services. On the other hand, by measuring and analysing the app you gain an understanding of how the app is used and how users behave and this knowledge can be used to further enhance functionally and user experience.

After a successful launch, you need to deal with "what's next?" – Whether you have an end-user or enterprise application makes no difference, similar questions need to be answered – such as:

How do I deal with upcoming new device capabilities? How do we react to enhanced or completely new operating systems such as Firefox OS?

How can new features, for example Near Field Communication (NFC), be leveraged and used for customers benefit?

How do I deal with compatibility issues (e.g. iOS 4.x to 5.x)?

How often will updates be provided – only as problems arise or planned and scheduled in advance (or both)?

What can I learn from the user's behaviour and how can this help to optimize the App?

Who is using my app (age, demographics, geography and device)?

What special feature or functionality is used most?

How do users navigate through the app, what are the favourite uses?

How often is the app used?

Is the user base growing?

Are the users loyal? Do they use the app on a repeat basis (retention rate)?

This is the end of the final step, but not the end of the process, because now the customer can evaluate the success of the App, gather usage information and go back through the entire process to ensure on-going optimizations.

Conclusion

For a successful mobile application strategy one must consider many factors. The most important requirement is to have a strategy and a plan. Analyse your business objectives, core processes and understand your target market. Technology options should be discussed and chosen only after this step is complete. Concepts range from Native Apps for the highest speed and best user experience to less expensive mobile web solutions. A good App is always a work-in-progress, even after launch they should continuously be developed and optimized.

Appendix

Native App versus Mobile Web

Technically speaking, mobile applications (apps) can be implemented as native, hybrid or mobile web solutions. Each of these options has advantages and disadvantages. The choice of suitable architecture is determined by the application requirements. The following factors play a role:

Native Apps are downloaded from the App Store and installed on the device. Whilst in use such applications use only the device's own computing power. This leads to very fast apps that can also be used offline. Device-specific features such as cameras, accelerometers, gyroscopes, etc. (hardware sensors) can be fully supported. If necessary, communication with server applications is facilitated through lean text-based files such as JSON. Native Apps have to be

developed per target device, i.e. operating systems like Android and iOS. This means more effort on the one hand, but on the other hand, an optimal user experience can be created. The iPhone "Mail", "Phone" and "Camera" Apps, for example, are native implementations.

Hybrid Apps are also downloaded from the App Store and installed. Whilst in use they rely on a web server. Content is processed on the server at run time and transferred to the device. This means that they only work online, and that larger amounts of data must be transmitted in real time through the mobile phone network. Factors such as server computing power and telecom bandwidth have a direct effect on the user's experience of the app. Device functions such as camera and sensors can be integrated. Hybrid apps have the advantage that the server application only needs to be developed once to work on different operating systems like Android and iOS, etc. This concept leverages HTML5 as the presentation layer. On the device side such applications are then running inside the app. This kind of app has an embedded browser which renders server created HTML5 into what finally appears as app content. You have to weigh the pros and cons of native vs. hybrid apps well. With hybrid apps, because the majority of processing does not take place on the device but on the server, you must expect all kinds of delays and this is usually bad for the user experience. The "[Facebook](#)" - "[Blick](#)" - and "[Tagesanzeiger](#)" Apps are implemented as hybrid Apps.

Mobile Web or **Responsive Design** requires nothing on the device side but a web browser. The real-time application runs on the back-end server and can be consumed on any device with a web browser. Cameras and sensors often cannot be supported. Branding and distribution via the App Store is not possible. The development process is easier. This approach is also interesting because with one single website all screen sizes and resolutions – from the smallest smartphone through tablets, PCs and up to the largest TV – can be accommodated. The server knows the screen size, resolution and orientation and the content is rendered in such a way that the user will enjoy the best user experience.

Some examples of responsive design can be found at:
"[informationarchitects.net](#)", „[smashingmagazin.com](#)", and "[focusonmobile.com](#)"
These sites are all implemented using responsive design.

Web Apps are a further variation on the above. With web apps the development is targeted at a single, specific device type. In this way device characteristics can be better addressed by the app. This may make sense if, for example, a company only uses one specific device throughout their workforce.

Considerations in regard of Promotion and App Adoption

Native and Hybrid Apps, compared to Mobile Web, ask for a completely different approach. Here are the main differences:

Mobile Web is positioning itself as a transparent extension of the Internet meaning that all the familiar tools such as AdWords and SEO techniques are available and content can be found by search engines.

Native and hybrid apps require support through dedicated tools such as iAd (Apple) and MobAd (Google). Content is not visible to search engines.

About us

We at MCSI build mobile experiences. We bring brands, products and service offerings to all relevant channels and allow employees and consumers to use mobile devices as smart tools and problem solvers. Integrated mobile strategy, application consulting, development and on-going support are our core business. We are always on the pulse of the latest social, technological and business developments. Together with partners – local, near and offshore – we create integrated solutions for today and tomorrow.

Mobile Consulting & Services International GmbH was founded in spring 2012 by Hansruedi and Daniel Joerg in Zurich. We became operational in August 2012.

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