

# DESIGNING MOBILE GAMES FOR WAP

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## DESIGN LIMITS & OPPORTUNITIES

Whether you are designing sports cars, furniture, or WAP games, the core of the process is always the same.

Besides having great ideas, you have to know what the fundamental characteristics of your chosen design area are – what *limits and opportunities* (let's call them "L&O") exist in this branch of design. These are the things you need to know to make a great product. Only after you have a feel for the L&O you are ready to nurture your ideas into successful designs.

In the area of game design, you typically get the basic feel by playing games on the target platform (say, a game console or a WAP phone). As a professional designer, you constantly enhance and revise this gut feel with input from:

- programmers (technical L&O)
- artists (visual L&O)
- sound fx people (audio L&O)
- sales people (business L&O)

As a result, you are able to make informed decisions about specific features during the design process. When you know your L&O you have a rough idea what kind of designs are doable and what not. For instance, a puzzle game based on guessing the right color won't work in a medium with monochrome screens (current WAP phones).

## DESIGN LIMITS ON WAP

You have ideas, you have ambitions. That's probably part of your motivation to be a game designer in the first place. If necessary, you may be willing to compromise but at the same time you try to preserve the core ideas. To get your WAP game ideas in tune with the real world, you need to consider the following design limits.

## **SITUATION: IDLE MOMENTS**

The most fundamental differentiating characteristic of mobile gaming is the situation.

On a PC or console, you typically play fairly long, continuous sessions. For instance, you may play a couple of hours after work every day.

The truth is that mobile phones are not the most hi-tech gaming devices on earth. If you have access to better gaming equipment, you are not likely to play with your phone. However, when you are sitting in a bus or in a downtown cafe waiting for a friend, you cannot fire up your PSX. The only device most people carry around is their mobile phone and they will use it when they have nothing else.

This is the core of mobile gamer behavior: mobile gaming remedies moments of boredom when there's no access to better gaming devices.

The result is a completely different pattern of playing – whereas traditional gaming consists of few long sessions, mobile gaming is all about multiple short sessions. Per minute charging for data calls is an additional incentive for the player to keep the game sessions short.



**Figure 1: Traditional game sessions (left) versus mobile game sessions (right)**

## **TECHNOLOGICAL LIMITS**

WAP stands for “Wireless Application Protocol”, a standard for delivering content (text, images & hyperlinks) to wireless devices.

Current WAP (1.1) is based on content residing on a server. The WAP enabled mobile phones are small browsers that connect to the server just like Netscape Navigator connects to WWW servers while you are surfing on the Internet. On WAP, the data storage and processing power are completely on the server side while the WAP phones themselves are dumb terminals.

From a game designer's point of view, this means that both the game content *and* the game logic *must* be stored on the server and only static pre-generated chunks of game content are delivered to the mobile phones.

Let me put it another way.

Think of a web page with only text, images and hyperlinks. No frame structures. No roll-over mouse effects. No fancy flash animations. No interactive java applets. Just text, images and hyperlinks.

Imagine writing a game for this system. Hypertext stories are the first to spring to mind. You get a bunch of images and text with links in it. Clicking on the links takes you forward in the story. If you play the game again and choose the same links as before everything will be exactly the same.

But wait, there's more. Since you may process data on the server, you may deliver different game situations based on the player's actions. For instance, you might attach a random effect to each link. Whenever the player selects a link, the game logic decides whether the following room contains a treasure or a monster before sending the new game situation to the player's phone.



Figure 2: WAP phones are dumb user interfaces, all game logic resides on the server



Figure 3: In SubHunter, the game board was rendered as a bitmap for each game turn.

As you can see, this mechanism is inherently turn-based. You deliver the player a chunk of static content (text+image(s)+links), she ponders for a while and responds by clicking a link. The game on the server moves on depending on the link the player chose and the system delivers another chunk of static content.

In our tactical naval game SubHunter the player gets an image of the game board. After looking at the board for a while, the player decides on new orders for her fleet and sends them to the server. The server responds by generating a new board image based on the game state after the orders have been carried out. Nothing will happen until the player sends her orders.

You might also want to make the links dynamic. For instance, in an adventure game, the player gets the link "blast lab doors open" only if she has already been to the weapons room. If she hasn't been to the weapons room yet, the blast option is simply not available.

From a game mechanics point of view, the most restrictive feature is probably the “fetch a document” nature of WAP technology. Analogous to HTML technology, this forces *all* WAP games into a turn-based mode. No real-time strategy for this platform.

In addition, current WAP implementations lack “push” capability. There’s no way to inform the player that something’s happened in the game world. Currently, you have to resort to short messages (SMS) if you want to alert the player. After getting the message, the player has to go through the trouble of launching the WAP connection and navigating to your game, possibly even logging into the service manually with an id and password. It would be much more convenient to simply push a WAP game screen to the player so that she would be able to respond immediately without any extra effort.



Figure 4: “Action” games on WAP are really turn-based tactical games.

Other WAP technology limits include:

- monochrome displays
- small screens – for instance, Nokia 6210 features practical bitmap resolution of 88x39 pixels
- slow & unreliable connection
- “device hell” – there are too many WAP phone models with different ways of rendering content to keep up with

On the whole, WAP resembles very clearly the early days of the WWW with multiple browsers and poor media content.

The final technological point is that mobile phones are small devices with a cumbersome interface, so be sure to keep the game interface *very* simple! Instead of adding a multitude of different features, concentrate on making the core game play easier to access.

## **BUSINESS MODEL**

As if it weren’t enough to tackle technical issues, successful designs require understanding the commercial environment as well. Basically there are several people your design should convince. Everybody on the chain has an idea what works on the market place and what doesn’t. The best you can probably do is try to think about all of them while doing your design and cross your fingers.

First of all, you need to convince some people in your own company that your design has a chance of success in the market place. How exactly this happens of course depends a lot on the structure of the company you are working for. Since you are bound to be familiar with people within the company, this is probably the easiest step.

If your company partners with a content distributor, they probably want something that complements their portfolio. It’s probably up to the individual tastes of the person doing the negotiations as well.

It gets tricky when we come to the level of individual mobile phone operators that actually deliver the game to the end users. It’s next to impossible to know what billing scheme operators in France, Israel and Hong Kong will be using six months from now. What it boils

down to are mundane questions like “will the operators buy this game if my design calls for sending thousands of unpaid SMS messages every day?” Can I use SMS or must I stick to only WAP though it has no “push” capability?

And finally, at the top of the chain awaits the fabled end-user. Displease her and you shall have no chance of success. Well, as long as WAP services are priced as they are now (relatively high charge per minute) the end-user’s number one concern is definitely cost of the service.

I recently played a labyrinth game hosted by a local WAP operator. All you could do in the game was move around in a 3D labyrinth (like in the classic “Dungeon Master”), collect keys and try different key combinations to the door leading to the next level. There were no monsters, just keys and a map on the final level. The game had four levels and it took me about 40 minutes to complete all of them. Despite the extreme simplicity, I must admit the game is actually somewhat entertaining if you have absolutely nothing else to do. However, as the price is about \$0.15 per minute I actually paid something like six dollars for this session. Suddenly, it doesn’t feel funny anymore. After all, I spent a lot of the time just walking around and trying to visualize the shape of the maze so that I could find my way around.

Keeping the game’s content and price in balance is a real challenge to the designer and there are currently no easy answers. Basically you just have to provide value sooner, not later (more on this later).

The categorization of casual and hardcore gamers is an ongoing debate in the game industry. Which group should WAP games be made for? On the one hand, there are more casual gamers but then again hardcore gamers tend to spend more money on games. There are no reliable statistics available on this yet but it’s very likely that both will provide business and choice between the two is more a matter of business strategy than game design.

## **RESOURCE LIMITS**

These are obvious limits, for no game production has unlimited supply of these basic development resources:

- money
- people
- time

In WAP games, resources aren’t typically a major design concern. At least not in the same sense as on the PC / console market since WAP game projects tend to be much smaller and thus the financial risk involved is easier to accept. Typically other factors (like playability issues) force you to simplify the design so that budget isn’t a big problem – scaling down the amount of narrative or graphics may happen occasionally but that doesn’t usually affect the core game design.

# DESIGN OPPORTUNITIES ON WAP

Now that we're familiar with the most important design limits, let's take a look at the brighter side – what interesting opportunities does WAP offer for game designers?

## THOSE PRECIOUS MOMENTS

Since the entry cost of a game is very low, people are often willing to give your game a try. Paying a data call for a couple of minutes is quite different from handing over \$42 for a CD-ROM package. In addition, players feel safe when they know that as soon as they stop having fun, they can also stop paying for the game by simply disconnecting.

The implication for the designer is to provide entertainment value sooner, not later. If people are willing to try out your game for a minute or two, it's absolutely crucial to hook them during those precious moments. If you start with a narrative intro, it had better be top quality. Yawns cost you users very quickly. Depending on the game, you may want to consider throwing the player directly into action and giving the introductions later.

If the game is complicated, provide an easy way to get started. Many CD ROM games are constructed this way these days – the player simply doesn't have access to all the features until later in the game. This may be a worthwhile approach in WAP games as well.

## LOCATION BASED GAMES

The possibility to use the player's actual real-world location data is something quite new in games and certainly opens up new avenues for a clever game designer.

## MOBILE PHONES WILL BE VERY, VERY COMMON

Analysts predict that there will be a billion mobile phones in the world by 2003. If you believe the manufacturers, most mobile phones will be WAP enabled by then.

The amount of potential players will be so staggering that even very short 1-2 minute games may be successful if enough people play them once. On the other hand, you only need a tiny percentage of all WAP users to support an addictive long term game. Both approaches will probably be valid in design.

In addition, with such huge numbers, there shouldn't be a lack of opponents for multi-player games once people get used to the idea of playing games on wireless.

## PEOPLE CARRY THEIR PHONES WITH THEM ALL THE TIME

In a typical PC network game, you have to get all the players to sit down simultaneously and play for an extended period of time. On mobile, your online world can send messages to the player at any time of the day and the player is able to participate by spending a minute or two to respond to the message.



## **FLEX YOUR CREATIVITY**

Since WAP game productions are small, more designs get through – depending on the size of projects, you can easily work on 10-30 game designs per year! This provides an opportunity to try out a lot of different ideas in quick succession.

## **GAME DESIGN FOR WAP**

I've already discussed many important design issues in conjunction with the limits and opportunities but a couple of things remain.

### **RE-PLAYABILITY**

What is re-playability? Re-playability means being able to enjoy the same game over and over again. Chess is a good classic example, since having played it before does not lessen your enjoyment in any way (assuming you like chess).

On the PC / console market, game titles seem to be designed mostly with the thought "buy our next title soon" in mind. For instance, game levels are typically tied to a linear narrative. Once you have played the game through, it's unlikely you would start playing it again. This makes perfect business sense. After all, as a player you get tens of hours of linear content so there should be more than enough bang for the buck. Quite naturally, the game publisher needs you to buy more titles – why would they want you to play the same CD-ROM for the next two years?

On WAP this isn't as self-evident. The mantra should probably be more on the lines of "stay with our game as long as possible". Due to the per minute billing system, the longer you can keep the player glued to one title, the more you are winning for the investment your company made in the development.

Long linear narratives will probably work if they are intensive enough to let players feel they are getting value for their money. To do this you need to divide the narrative in short episodes and even shorter challenge + gratification elements.

The point is that unlike in the business where you sell CD-ROMs and memory cartridges, there's room for other, more dynamic design approaches on WAP. Re-playable games make perfect sense on WAP.

### **PERSISTENCE**

Your game needs a high level of persistence – that is, the player should be able to leave off anytime and later pick up the game from the exact situation where she left it. This is understandable when you think about how fragmented the mobile play sessions are. As a player, you are paying for every minute and you definitely don't want to pay more to do the same things over again.

### **PROVIDE VALUE SOON**

I already touched on this subject but here are some additional thoughts.

I played Ion Storm's Deus Ex a while ago. I liked the game a lot and now that I think of it, I realize that I often found myself sneaking around, evaluating the situation, for instance the guards' and security bots' patrol routes. Sometimes I was just sitting on a rooftop waiting for the guards to show up. And it was fun.

The question is, would it have been equally fun if I was playing the game through a clumsy interface (WAP phone) and if I was paying \$0.15 per minute? Not likely.

On WAP, the games need to be more intense. Don't waste player's precious time by creating worlds where the player walks around ten minutes before getting some kind of gratification. Provide her with both a challenge and a reward within the first minute or two.

That doesn't mean the game should be too easy. It simply means that the dramatic structure has to be more concise.

It's a little bit like comparing a novel and a short story. In a novel you have plenty of pages to properly introduce your environment and characters to your reader before the real action begins. In a short story, there's no time. Short stories typically drop the reader into the middle of action. The introductions take place on the fly, and for a wonder, it works! Try to construct your WAP games to resemble short stories rather than novels.

Bottom line: provide value sooner, not later – people are paying dearly for it.

## TEXT ADVENTURES & OTHER 80'S GAMES

WAP game development is often compared to the game development in the early 80's due to similarities in graphics capabilities, production team sizes and budgets. Some claim that this is a comeback for 80's games.

Are 80's game conversions really the key in mobile gaming? Can we just port all those game classics to WAP and avoid wasting money on designing new games? Let's examine one of the good old 80's genres – text adventures.

Text adventures? Oh yeah, those that had lots of text and pretty pictures. Hmm. Text and pictures? That sounds a lot like WAP, doesn't it?

Think again.

No one can seriously recommend writing complex text adventure commands like "examine blue bottle" on the keypad of a mobile phone. Typing errors will abound and people will simply find your game too difficult to play.

Also, think back how often you got "unknown command" or something like that from the text adventure parsers even though you were using perfectly valid English words – you definitely don't want to iterate your command three or more times on a mobile phone where you pay by the minute.

In addition, the screens and memory sizes of mobile phones are very limited – it is not at all obvious that you can simply copy-paste old text adventures onto a WAP phone. The text for

a single location may not fit on a single WAP deck (the basic chunk of WAP content that has a practical maximum of about 1.4 kb after compression). Even if it does, reading lots of text on a WAP phone screen is much more inconvenient than on a TV screen.

Now I'm not saying you cannot bring 80's text adventures into WAP. You can, but to make it work you need to re-think the way commands are given, redo the graphics (making sure any puzzle clues on images are still visible in 88x39 monochrome format), cut unnecessary text and generally shorten the slack times when nothing happens (remember, provide value sooner, not later). Wandering around in an empty labyrinth for a long time just to get a feel of what's going on is fatal at \$0.15 per minute.

Finally, let me pose you a question: are you 100% sure that early 80's games are mega hits with current mobile phone audiences?



Figure 5: Turn-based PONG on WAP? Is this as much fun as the original?

## GREAT IDEAS

Ultimately, successful game design is about great ideas. The mobile game market is now in its infancy but soon the market will be flooded with all kinds of titles. As in any new medium, most content providers will try to push content from old media to the new one, thinking on the lines of boxed CD-ROMs and early 80's games. Mobile is a new world and the true heroes of mobile game design will be those who discover the game concepts that fit this new medium's special characteristics best.

Without great ideas, we will soon be producing endless series of game clones like on the PC / console market. We have all seen how most of the poor clone games fail on the market (real-time strategy, anyone?) while a handful of star products bring in the jackpot. Well, maybe the copycat phenomenon is unavoidable. On mobile games, the signs are already visible. Unfortunately.

## SUMMARY: DO's and DON'TS

Here's a summary of the key points in this paper.

### DO...

- ... provide value soon!
- ... keep it simple!
- ... think what kind of games you can do to a turn-based, HTML-like environment
- ... come up with great game ideas
- ... honor the traditions and push the technology to its limits
- ... remember the mobile gaming situation: lots of short sessions!

## DON'T...

... think classical games like text adventures will work just like that on WAP  
... think too much on the lines of boxed CD-ROMs, mobile is a different world

## FINAL WORDS

WAP is an evolving standard. What I have presented here is based on the current version of WAP (1.1). Future versions may well include "push" functionality, color graphics and maybe even streaming media or 3D acceleration. Whatever the future of WAP, mobile gaming is here to stay in one form or another and designing games for WAP is a great way to learn the rules of mobile gaming.

The pricing of WAP services may change in the future. Some speculate that there will be I-mode-type monthly fees instead of per minute billing. Even if this eases game design somewhat, the same basics will apply. For instance, you would still need to provide entertainment value within a reasonable time since mobile game sessions are fragmentary in nature.

## FURTHER INFORMATION

WAP specification:

<http://www.wapforum.org>

Articles on various WAP issues, like design and usability:

<http://www.anywhereyougo.com/wap>

<http://www.thefeature.com>

<http://www.wirelessdevnet.com/channels/wap/>

An article explaining why Japanese I-mode has been more successful than WAP so far:

[http://www.japaninc.net/online/sc/ntt/sep00\\_sc\\_imode.html](http://www.japaninc.net/online/sc/ntt/sep00_sc_imode.html)

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