Mobile Game Graphics – Overcoming the Small Screen Challenge

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Graphics appeal

Great graphics provide great experiences! With games, graphic attractiveness is a key element in creating an enjoyable user experience. In fact, the first impression and the entire mood of a game session are created in the first few seconds after the user has launched a game. Providing a WOW! effect right at the start sets a positive tone for the whole session.

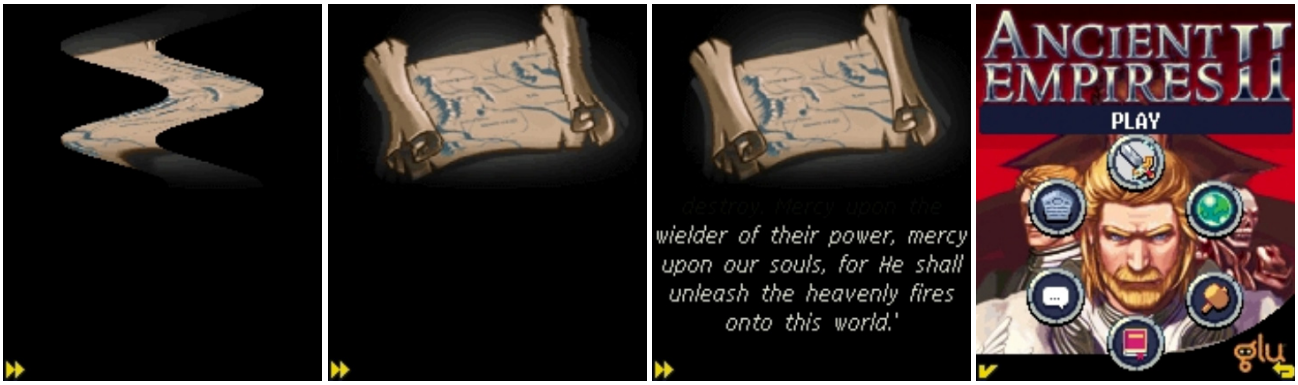

Figure 1: Ancient Empires II is a good example of using transition animations and text to create a feeling of interactivity. (Images courtesy of Glu mobile)

Designing graphics for mobile games is very different from designing for PC games. This article presents some best practices and visual examples of graphic design for mobile games. It also focuses on overcoming some of the main usability and user experience limitations: the small screen size (with portrait and landscape modes) and the mobile context.

We will apply the judo rule – turning your weaknesses into strengths – to the limitations of mobile graphic design.

Device restrictions

The main restrictions a mobile device imposes on graphics and artistic freedom are the available memory size, the processor capacity, and, most obviously, the limited display size and resolution. If a game runs slowly or a device freezes, this is not a good gaming experience. Additionally, a game application should not use up other system resources, such as battery power. The overall user experience is not good if, for example, the battery dies shortly after an intense gaming session while the user is traveling on a train.

Performance issues can be addressed with good design, proper planning, and testing. Use only graphics that are meaningful, limit the use of large graphics, and consider carefully which animations are really needed. Check to see if there are alternatives; for example, find out if some animations (such as sparkling stars) can be implemented with a few lines of simple code.

Finding a balance between good graphics and device limitations is an iterative process — test early, and test often!

Overcoming the display challenge

The display of the mobile device sets the primary limitations for game graphics. The most critical display limitations are screen contrast and small size.

Contrast

Often mobile games are played in situations where viewing the screen is challenging. For example, bright sunlight requires very good contrast to make objects on the screen easily visible. Playing a game on a moving vehicle, such as a bus or a train, makes it harder to perceive movement on the screen. And different game objects need to be clearly differentiated from the game background.

Figure 2: Contrast affects the gameplay. (Images courtesy of Glu Mobile)

On the other hand, decreasing contrast between the background and the game objects and adding more action on the screen could be a good game mechanism for increasing the level of difficulty later on in the game (for example, in a shoot-'em-up action game). Remember to implement this kind of effect gradually, and only in the later stages of the game when the user has mastered all of the game controls.

Figure 3: Alpha Wing II uses contrast to increase game difficulty in later levels. It is difficult to notice enemy ships from fast-moving 3D background with similar colors. (Images Courtesy of Glu Mobile)

Use clear and meaningful graphics – make every pixel count!

Mobile display size is limited, so make sure that every graphic is meaningful. Inefficient use of graphics in mobile games creates clutter and visual noise on the small screen, increases the file size of the game, slows the game, and impairs the playability and user experience. Every graphic (whether a game character, an animation, or a background object) should always have a justification for its existence and guide the player toward achieving the required goals.

Although the mobile screen is small, graphics must be clear and sufficiently large. A mobile player may get distracted and lose focus during a game; the graphics should allow him or her to quickly and easily return to the game and resume play. Small items on the screen can be easily missed.

A clear distinction between different objects is important. For example, differentiate clearly between friendly and opposing game characters, dangers, obstacles, bonuses, and especially the player's character. The player should be able to easily identify enemies within a reasonable period of time. Different shapes, appearances, colors, sizes, and actions can help the player recognize various objects in the game. In multiplayer games, the friendly characters must be clearly differentiated so that players can identify who's who.

Figure 4: In Ancient Empires II, consistent color coding is used through the game to separate friends from foes. (Images courtesy of Glue mobile)

Apply the judo rule to the display size limitation

The judo rule: Turn your weaknesses into your strengths. If you cannot escape the limitations of the small screen, use them to your advantage! Think of ways to turn the screen size into an integral part of gameplay — part of the game's challenge that the player must learn to overcome. Make the small screen a cognitive challenge, not just a visual limitation.

One design strategy is to emphasize the importance of what **is not** displayed on the screen. This means that the game area should be bigger than the screen area. Knowing, remembering, anticipating, and guessing what is outside the field of vision can be an essential part of the game experience!

Some example scenarios include platform jumping games or first person shooters, where the screen only displays what is in front of the player character. Because the player cannot see what is behind or around him/her, the player must be wary of an enemy lurking around the corner.

Figure 5: Lock'n Load 2 is a good example of a 3D game that expands the game world outside the screen limits. (Images courtesy of Blaze)

Going landscape

When using a mobile device in "landscape" (that is, using a widescreen orientation), there are a few issues you have to consider. The landscape mode (for example, Gallery application in the latest S60 3rd Edition devices) can be very useful for some game types, such as platform games, where scrolling from left-to-right (or right-to-left) is needed. Some devices can also be ergonomically better for longer game sessions in the landscape mode.

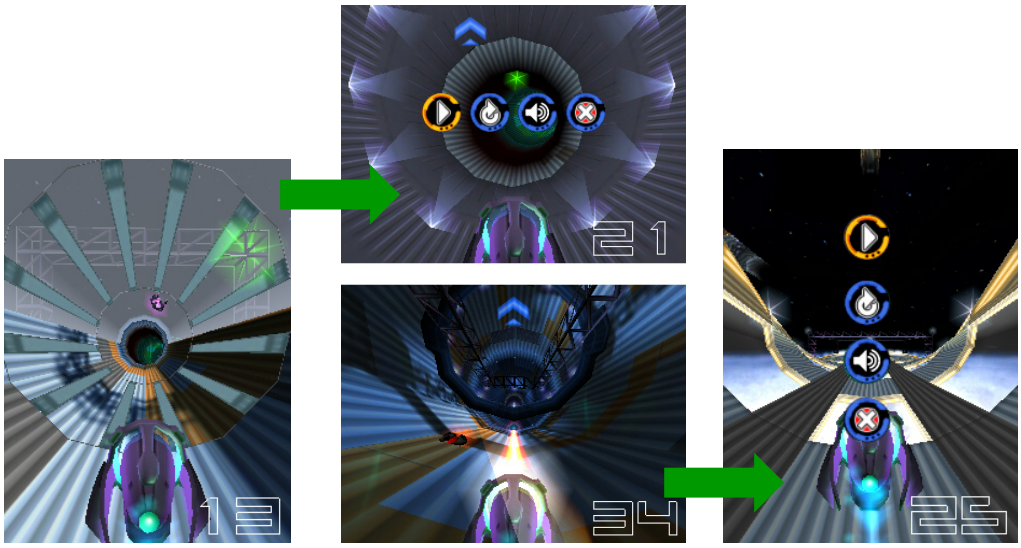

Figure 6: Games should handle screen orientation change correctly.

In many cases changing the display orientation for an existing application will require a lot of re-work, if this requirement was not considered already at the design phase or if the whole game was simply designed for a certain orientation.

Among the latest S60 devices there are not only some fixed landscape screens, but also devices where the screen orientation can be changed by the user (either physically by turning the screen or with software by executing the rotate application). In general the application should follow the orientation the user has chosen, and adapt accordingly. Unless considered early in the game design, the requirement to handle the orientation change "on the fly" may be difficult — even if graphics and layout could scale. Locking to a certain orientation is not recommended, unless it is a crucial aspect of that gameplay.

There are a few usability considerations you should remember:

- Using the keypad and controls can be more difficult if the device screen is held horizontally. The user is likely to make more mistakes in fast-paced games. Design the controls accordingly.
- Use softkeys correctly also in horizontal orientation:
  - When the keypad is to the right of the display, the upper softkey corresponds to the **right** softkey functionality (Exit, Back, Cancel) and the lower softkey corresponds with the **left** softkey functionality.
  - When the keypad is to the left of the display, the upper softkey corresponds to the **left** softkey functionality (Accept, Options) and the lower softkey corresponds with the **right** softkey (Exit, Back, Cancel).

The most important issue to remember is that many Nokia devices are capable of using (and changing between) both portrait and landscape screen orientation. It is important for the developer to consider this, and at least inform the user if the game is unable to support both orientations. Leaving the user with a blank screen or application that ignores the change is the worst outcome.

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