



Interactive User Experience (IUX) Going Beyond Interfaces

A Harbinger Group White Paper

Harbinger Group

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This white paper is part of Harbinger's iPhone Application Development practice. Harbinger's iPhone Application Development practice provides software development and migration services for building consumer utility applications, business applications and mini-games on the iPhone, iPod and iPad devices. Visit our [iPhone Application Development](#) practice to learn more.

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Executive Summary

This Harbinger Systems white paper identifies Interactive User Experience, or IUX as the next frontier in human-computer interaction. IUX combines three types of interactivity, which in turn exploit unique platform capabilities such as direction, touch, orientation, location, movement and proximity. The transition from user interface (UI) to IUX is as revolutionary as the transition from command-line console to GUI three decades ago. The paper explains IUX, the three types of interactivity that enable IUX, and presents examples based on Apple's iPhone, the pioneer and by far the most successful IUX device.

Interactivity: Beyond Interfaces

User Interface or UI has been the cornerstone of personal computing revolution for over three decades. The advent of personal computing industry owes a lot to the UI revolution. Graphical User Interface or GUI invented at Xerox PARC and made popular by Apple and then Microsoft brought computers closer to users like never before. Multi-touch has been one of the most talked about features of iPhone and iPad. But is touch-screen, and indeed multi-touch-screen, just an incremental improvement in User Interface?

One of the things that touch-screen does is to get rid of the two standard ways of user input: the physical keyboard and the mouse. In other words, touch brings the personal computer one step closer to humans. The user can now *interact* with the virtual objects inside a computer much like they interact with physical objects outside. This new *interactivity* dimension is set to change the industry in very important ways over the next decade as it enables users to engage with their devices very intimately. Some examples of popular features that have captured users' imaginations when it comes to their interaction with their mobile devices are direction, orientation, location, movement and proximity. These features ultimately enable users to have what we call, *Interactive User Experience* or IUX.

Interactive User Experience (IUX)

Interactive User Experience or IUX provides users with an immersive user experience, and is enabled by the interplay between device features like orientation, direction and others mentioned in the previous section. These various interactivities enabled by these features fall in three categories, which we will describe in the following sections: *Interface Interactivity*, *Sensor Interactivity* and *Location Interactivity*. As you build applications for these new-age devices, you need to not only think of these categories of interactivities and their capability individually, but also the way they can work with each other to provide a truly engaging user experience.

INTERFACE INTERACTIVITY

This category of interactivities encompasses the multi-touch interface, the big screen, the soft-keypad, the ability to flip through screens, gestures like pinching and tapping and many others. These are based on innovative user interface designs that are a big leap from the traditional user interfaces. This interactivity is slowly making its way into applications from various industries. For example, publishing and e-Learning industries are finding it particularly useful to provide a natural interface for reading and browsing through material. Figure 1 shows an example of how an eLearning application developed at Harbinger Systems uses the flipping gesture to provide a superior learning experience.



Figure 1: Interface Interactivity used in an eLearning application by Harbinger

Figure 2 below shows an example of how Harbinger used multi-touch functionality to build a mini-game where multiple numbers can be touched in quick succession to arrive at the answer.

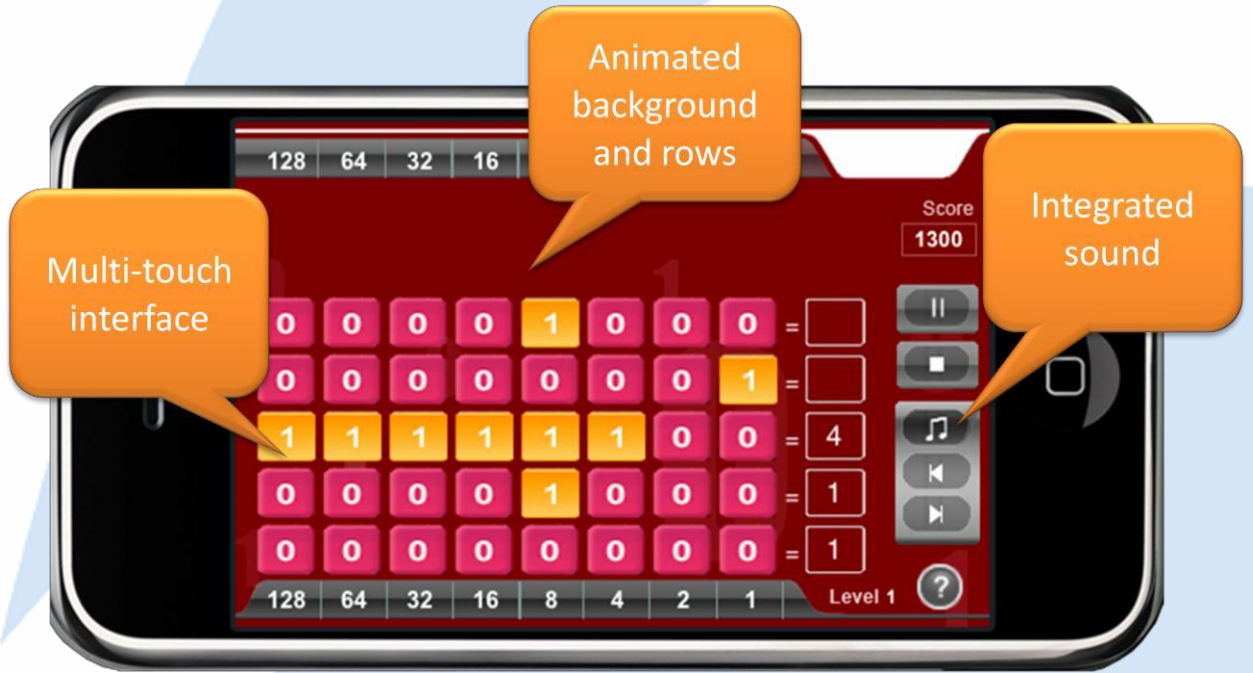


Figure 2: A mini-game developed by Harbinger that uses multi-touch and other interface interactivities

SENSOR INTERACTIVITY

Devices like the iPhone and iPad come with sensors that are used extensively by applications to interact with the user. While even the phone camera is a sensor interactivity that has been around for many years, there is a whole new set of interactivities in this category that have been immensely popularized by the iPhone. These include the use of accelerometer and proximity sensor to identify orientation and nearness of the device to an external object respectively. The accelerometer is a very useful sensor that is used in various user input activities such as identifying device orientation (landscape or portrait), ability to shuffle, and many other interactions that make these devices feel like an extension of the human body.

Many interesting applications are being built in the consumer internet, gaming and entertainment industries that utilize this category of interactivities. Figure 3 shows an example where Harbinger used the accelerometer to rotate the wheel in the Wheel of Fortune trivia game.



Figure 3: A trivia game built by Harbinger, which is based on Wheel of Fortune that rotates with a shake of the device

LOCATION INTERACTIVITY

Location awareness has been around for mobile and portable devices for some time. There are many devices that are location aware and many applications that use GPS (Global Positioning System). However, the real power of location is realized only when applications combine location awareness with interface and sensor interactivities described above. For example, the combination of device orientation (specifically, the direction it is pointing) and its current location can be used in providing visual turn-by-turn navigation from the viewpoint of a user on the road. It is not difficult to see how this greatly enhances car navigation over traditional look at a map from the top.

Figure 4 shows an example of location interactivity. In this application, Harbinger uses location interactivity to track an athlete's training route, and integrates it with his or her workout routine.

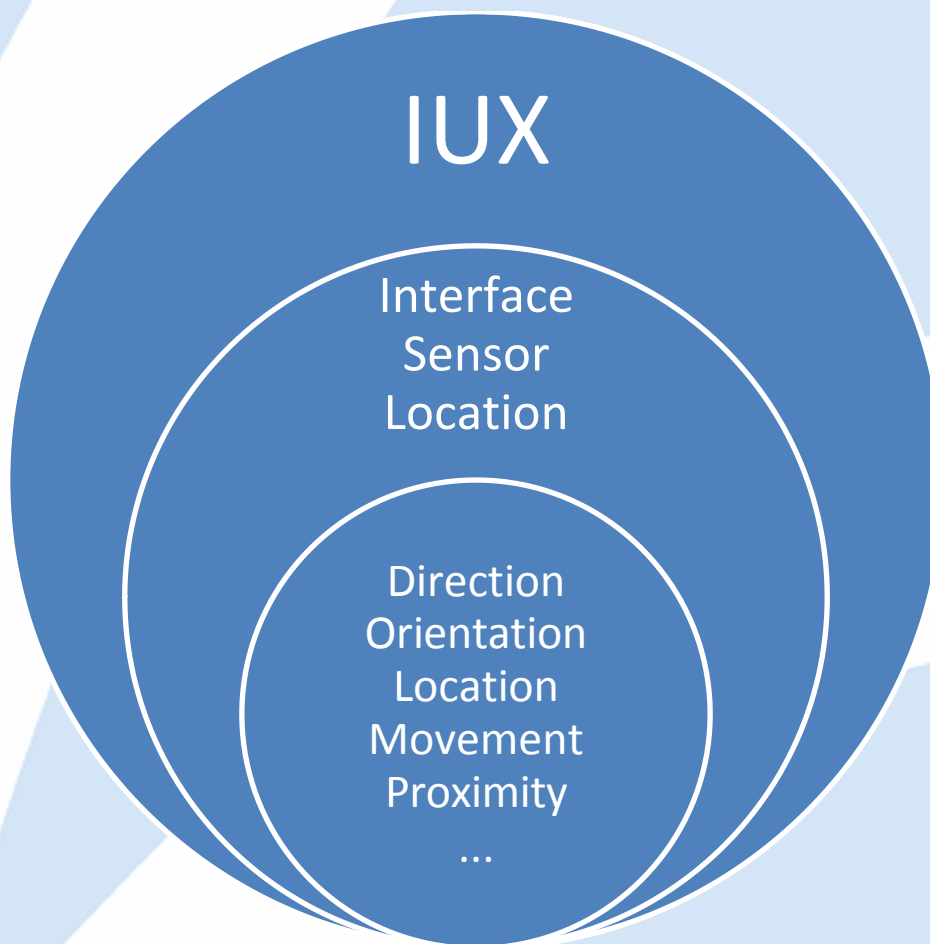


Figure 4: GPS being used to track an athlete's training route (developed by Harbinger for a sports training portal)

It is worth mentioning here that location identification is also enabled by means other than GPS, like Wi-Fi hotspots and cellular towers. Identifying two users in proximity with each other through these means holds great potential for application vendors in gaming and consumer internet space.

Conclusion: Combining Interactivities for Creating IUX

Some of the most interesting user experiences in mobile and personal computing are going to be where these three forms of interactivities intersect. In the near future, IUX will come in the form of wearable devices (or close-to-wearable devices like the iPad and iPhone), which will provide users with a very immersive experience. Just like the advent of the PC went hand-in-hand with GUI, the advent of next generation computing devices that are physically closer to humans will be spearheaded by IUX. Application vendors need to think out of the box, and think of interactivities from the perspective of combining these categories to create Interactive User Experience. Harbinger Systems helps companies build IUX through in-depth understanding of these interactivities and their interplay.



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