

WILL BABY FACES EVER GROW UP?

Lars Erik Holmquist

PLAY: Applied research on art and technology
The Viktoria Institute, Box 620, S-405 30 Gothenburg, SWEDEN
<http://www.viktoria.informatics.gu.se/play/>
leh@viktoria.informatics.gu.se

1 Introduction

For a discussion about user interfaces for small screens, so-called *baby faces*, it might be interesting to start with considering another type of “baby faces” – namely, real ones. Until quite recently, human children were perceived as being basically smaller versions of adults, who were just waiting to become strong and educated enough to take their productive place in the grown-ups’ society. But with the increasingly high living standard of the industrial age, coupled with a more developed education system, it became apparent that children are in fact unique individuals and quite different from adults in their needs and capabilities. Nowadays, there is an understanding that children are in fact inherently different from adults in many respects.

At the moment, baby-faced computers are perceived as smaller versions of their desktop “parents”. But there are many factors that make baby-faced computers inherently different from desktop computers, just like children are different from grown-ups. It is quite possible that with baby faces, many new uses for computers will be found, and completely new markets will open up, with baby-faced computers reaching user groups that are different from anything that has come before. These baby faces may be used for very different tasks and in very different contexts than that of the comparatively well understood desktop setting. Users then will want to bring their baby faces on buses or trains, use them in cars or while taking a walk, completely changing many of the parameters that have previously dictated human-computer interface development. Therefore, can not go on thinking of baby faces as if they are basically desktop computers that just happen to be very small!

2 Why baby faces are different

Whereas a desktop computer is very much identifiable as a “computer”, and therefore approached by users with an appropriate mindset and often a great

deal of respect, tomorrow's baby-faced computational devices may not be perceived as computers at all. These will be the future versions of mobile phones, watches and notebooks, aimed at everyone from schoolchildren to grandmothers. Therefore they may require quite a different approach to usability compared to what currently dominates the field. We may very well find that the conventions of user-interface design that have been defined and refined during the last twenty-odd years of desktop computing do not apply to these new computing devices.

The shift from mainframe computers to desktop computers gave rise to a radical change in how computers were perceived and used. If there is a similar shift to even smaller computers, it should be safe to assume that this will make computing even more accessible to the general public. If this will be the case, the challenge of creating user interfaces for these ubiquitous "baby faces" will be much greater than the one that faced designers when the first so-called user-friendly computers were constructed. While the first machines based on graphical user interfaces were a revolution in their day, tomorrow's mass-market screen-based devices may reach people who would never think of using a "real" computer. A majority of baby-face users might well be completely baffled by traditional user-interface conventions like folders, scrollbars and menus. Should we then force them to accept these conventions, or should we see this as a chance to come up with something better?

Even current baby faces have many properties that can pose unexpected problems. When exploring novel user-interface designs on small screens, we have found that it is far from straightforward to adapt techniques developed on traditional screens to their smaller counterparts. For instance, the shape of the screen is often different. Whereas almost all PC screens have the proportions 4:3, a typical keyboard-based PDA has "wide-screen" proportions, approximately 5:2. Pen-based PDAs, on the other hand, have proportions more closely resembling that of a traditional monitor turned on its side. This change in proportions can make some pixels more precious than others; for instance, on the wide screen, vertical space is much more scarce than horizontal.

Anyone who finds this to be a trivial observation should try the following experiment: take a piece of cardboard and cover the lower half of your computer screen. Then try working as normal. You will probably soon find the generous horizontal icon bars on your web-browser and word processor to be a major distraction, since they take up a lot of valuable (vertical) screen estate. The thick borders and title bars on application windows will also soon seem like an intrusion. Indeed, it seems that window-based user interfaces are not very suitable to small screens, and on many current PDA models, software applications are usually allowed to occupy the entire screen with no window borders. Interestingly, the makers of a major operating system for small devices

do not necessarily seem to agree with this approach, since they are even using the term “Windows” as a selling point! Time will tell if the flexibility of having a true windowing system will be enough to offset the loss of valuable screen space to borders and title bars.

3 Size is not all that matters

Besides the size and shape of the screen, there are many other factors that should be taken into account when designing interfaces for baby faces. For instance, small devices are not on the same curve of increasing processing power from which stationary and laptop PCs have long benefited. For pocket-sized devices, battery-life is often considered more important than speed, which means that it is rarely possible to perform advanced graphical transformations or content filtering. Researchers working with solutions for traditional screens can often safely assume that even if requiring an expensive super-computer today, their techniques will run effortlessly on consumer PCs a few generations down the line. Designers for baby faces can not always afford this luxury.

Another aspect worth noting is that the user-interface components that we take for granted when designing for desktop computers may behave completely differently on small devices. For instance, the author once used a pen-based hand-held computer with a touch-screen to look at a page of text. Only a few lines were visible on the display and he naturally pointed the pen to the scrollbar and started to drag it to reveal more text. But since the author is left-handed, and the scrollbar was on the right-hand side of the screen, he covered the whole display with his hand in the process! As computers move off the desktop and into the hands of users, designers will have to take the whole interaction model into account, not just the size of the screen.

4 A challenge for user-interface designers

There is no question that from a purely technical viewpoint, most computing functions can be miniaturized enough to allow them to be crammed into a pocket-sized device. But the question remains whether these functions can be accessed in a meaningful way. If the only way to make all this functionality accessible is through an extremely small screen, it will put extremely high demands on the design of the graphical user interface, demands some designers currently seem unable and even uninterested to meet.

As a case in point, mobile phones are perhaps the most ubiquitous “baby faced” devices currently in use. The penetration has already passed 50% in several Scandinavian countries, and soon mobile phones may be as common as stationary phones. Modern models give the user access to a multitude of

functions, most of which are hardly ever used. It seems that the design of these phones give rise to a form of “functionality hiding”, in that the limited size of the display implies that all functions will have to be accessed by wading through endless menu options. Only the most persistent users will ever have the patience to explore these options, leaving most of the potential functionality untapped.

This author has personally spent many frustrating hours navigating the menus of his new, top-of-the-line phone. The device will supposedly handle everything from fax messages to databases and shopping list, throwing in the occasional action game in the process. Despite this, the author has barely been able to use it even for basic tasks such as entering often-used phone numbers. We can only imagine what a usability nightmare it will be when all phones come with built-in e-mail clients, web browsers, and word processors. Will the designers and marketers of these devices expect all new customers to have a degree in computer science before making their first call?

5 Conclusion

Designing user interfaces for small screens is a difficult problem, much more difficult than it may seem at first glance. We can not simply take established interface conventions and “shrink” them to baby face size, because just like children have a unique way of life, baby faces are different to desktop computers in ways that we are only beginning to comprehend. But this difference also presents great opportunities for interface designers to find new and valid interface paradigms, paradigms that will be relevant not just for baby faces, but for mass-market computing devices in general.

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