

Creating the mass market for Symbian OS

Summary

An advanced, open, operating system is required for the evolution of applications and services that will increase revenue streams for mobile operators. This paper explains the need for an operating system that supports data-enabled mobile phones in next-generation networks.

1. Introduction

The relentless increase in user requirements for mobile phones means that proprietary operating systems adopted by mobile phone manufacturers ten years ago are now at their limits. But mobile phone manufacturers have adopted a new operating system – Symbian OS – that has significantly greater ability to meet this increasing range of requirements. Without Symbian OS, this new functionality would be out of reach.

2. Who needs an open operating system?

How many of us can name the operating systems at the heart of mobile phones from companies like Motorola, Nokia, Siemens, Sony Ericsson or Panasonic? The mobile phone market has been dominated by manufacturers' brands, not the nameless proprietary operating systems in their products.

These operating systems do have names, and each of them has had countless developer-years of work poured into it. And the huge effort has paid off – in terms of developing market share for mobile phone manufacturers. The mobile phone industry is currently dominated by operating systems that the general public neither knows about, reads about, nor cares about. But that is about to change. The change is due to user demand for new functionality, which has driven the need for an open, advanced operating system upon which a broad developer community can build advanced applications and services.

3. New waves of functionality

The requirement for a new operating system is driven by overlapping waves of functionality in forthcoming mobile phones. Each wave will be more compelling than the last. The first wave is *auxiliary* functionality and the second wave is *integrated* functionality.

Auxiliary functionality is when some extra functionality is bundled with the phone, such as a calculator, a notepad, a game, a music player, a watch, or an alarm clock. This new functionality, when it works well, allows consumers to travel light, leaving other items at home (and in the shop). Why carry multiple devices when one will do just as well?

This kind of extra functionality is classed as 'nice to have' – ranging from 'quite nice to have' to 'very nice to have'. But it's not as compelling as integrated functionality. Integrated functionality doesn't just give you 'a phone plus something else'. It gives you a better phone.

Integrated functionality enhances features that are core to existing phones. For example, mobile phones allow you to store phone numbers and assign names to these numbers for easier recognition. This is the start of a contacts database. Better phones have better contacts databases. Key features include effortless synchronization to contacts databases held elsewhere (such as on PCs or the Internet), multiple phone numbers per contact, and ease of adding new entries or editing existing ones. Better mobile phones make it easy to communicate, in any way, selectively and painlessly, through seamlessly integrated messaging

(email, voice, text messaging, picture messaging and fax and so on). The result is that it becomes easier and easier to use your phone to keep in touch with all the people who are important to you.

4. Symbian OS as disruptive technology

What kind of operating system is able to support an increasing number of mobile phones with the latest high-end features?

When there is a whole range of desirable new high-end features on the scene, the scope for cleverness in engineering is liable to expire – especially if these new features interact in clever ways with each other (and with the core original features of the phone). Evolutionary product development no longer suffices.

The small, embedded operating systems adopted by mobile phone manufacturers ten years ago were designed to support telephony protocol software and run a simple user interface. Consequently, the complex integration involved in making a modern data-enabled mobile phone on such simple operating systems results in ever-lengthening development schedules and produces ever less-reliable products.

Now a new kind of operating system is available, designed to take mobile phones to a new level of communications functionality. It is an example of a disruptive technological innovation – an innovation that utterly changes the market by interrupting the path of an incumbent technology. Disruptive technologies can take some time to come to fruition before assuming a new position of market prevalence.

The leaders of the mobile phone industry foresaw the need for a new operating system. During the early months of 1998, senior managers and technicians from Ericsson, Motorola, and Nokia held a series of discussions about a brand new operating system for future generations of mobile phones. Senior managers from Matsushita (Panasonic) joined them later. They reached agreement on four basic principles:

- their existing mobile phone operating systems were designed to run only a basic user interface (UI) and some simple proprietary applications
- a next-generation phone operating system would be a major investment, that would take years of effort to develop
- each company would benefit by co-operating in the identification, support, and development of a next-generation mobile phone operating system, as an open standard that exists for adoption by the whole industry
- the best starting point for this operating system was the operating system then called EPOC, developed by engineers at Psion Software in the UK.

EPOC evolved into Symbian OS and Psion Software became Symbian.

5. The innovator's dilemma

Symbian OS was not designed to support phones that are fairly straightforward improvements on existing models. It was designed to support smart mobile phones, on next-generation networks, long into the future – phones that will be very different from those of today.

As with any disruptive technology at an early stage of its adoption, there is a sharp learning curve for any company switching to it, away from their existing nameless operating systems. In-house development teams are extremely familiar with their proprietary operating systems. Symbian OS demands developers learn new skills to make use of advanced features of C++ and object-oriented programming, and because it is much richer in functionality it has a large set of Application Programming Interfaces (APIs).

It is tempting, therefore, to seek to squeeze in yet more rounds of incremental product development based on the existing operating system. Such development is bound to be quicker than a first product development on a brand new operating system.

This neatly illustrates the innovator's dilemma. In the short term, a disruptive technology is more costly than an established technology, in several different ways. But the wise would-be innovator takes a longer-term view of things.

Existing operating systems will still have some vitality in them, which can be squeezed out by clever engineers, resulting in products that are evolutions of a previous generation. However, Symbian OS brings with it support for complex new requirements, enabling revolutionary product development. Having a much more sophisticated design, its virtue is that it is 'future-proof'. Symbian, as the trusted supplier of software to the leaders of the mobile phone world, benefits from peerless industry foresight. Symbian, from its close contacts, learns which technologies are just vaporware, and which are for real.

Symbian OS prepares mobile phone manufacturers to withstand and exploit unpredictable changes in technologies, customer expectations and market requirements. Symbian OS is ready for the technologies that matter.

6. Starting the revolution

The first open Symbian OS phones – the Sony Ericsson P800, the Nokia 9200 Series Communicator and the Nokia 7650 – have given us a view of things to come. They are highly differentiated from one another, illustrating the flexibility of Symbian OS in accommodating the ideas of mobile phone manufacturers on how the software should operate in their mobile phones.

Not only do these Symbian OS phones have very different form factors, they also have very different UIs. These UIs are each different again from the UI on the PDAs created by Psion, such as the Psion 5mx and the Revo, from early versions of Symbian OS. Flexibility of UI system was one of the very earliest of the design goals of Symbian OS and these open, advanced smartphones show how successfully that design goal has been fulfilled. With Symbian OS at its core, there is no risk of the mobile phone market ending up with manufacturers having a smaller and smaller role to play, the main design being dictated by the operating system provider.

These Symbian OS phones provide an indication of what can be accomplished with a large color screen. You only need to see them in action to see their possibilities. With improved resolution, some of the same effects will shortly be available on slightly smaller screens. The resulting rich UIs will stimulate strong market demand for Symbian OS phones.

Another commonality is that these mobile phones demonstrate a strong integration of communications and messaging software with the original phone software. As reviewers have remarked, functions such as sending text messages are given very central positions within these devices, and are not in any way afterthoughts or oddities. The three core functions of (1) contacts database, (2) data messaging, and (3) voice calls, all interact very smoothly with each other. This is a defining characteristic of a Symbian OS phone.

Nokia and Sony Ericsson's products are examples of 'one-box solutions'. They are capable of replacing two devices: the user's phone, and the user's PDA (handheld, or even desktop computer). Before these devices came to market, it was hard to predict whether one- or two-box solutions would prove to be more popular with end users. Two-box solutions (in which a phone communicates with a PDA by means of infrared and/or Bluetooth) have the advantage of not needing to compromise on the form factor of either mobile phone or

PDA. However, the early market experience of Symbian OS phones confirms that there is a huge advantage of convenience in only having to carry one device. This bears out the fact that Symbian OS enables what is essentially a new class of devices. The more the word travels about the dramatic functionality of this new class of device, the more people will demand these smartphones.

7. Architectural vision

Do operating systems really matter? Don't end users want greater simplicity, rather than greater complexity? Yes, they do want greater simplicity. But, the route to greater simplicity, paradoxically, is via greater underlying complexity: it takes skill to make things look simple. A mobile phone interface that makes the user relax and feel comfortable is actually working a great deal harder than a phone interface that makes things complicated. You won't get a top-class mobile phone interface unless you anchor it in a top-class operating system. And although users want simplicity, they also want utility. In mobile phones, efficient power management is a necessity, as is efficient use of memory for avoiding memory leaks and so on.

Users want mobile phones that allow them to communicate easily and reliably with the important people in their lives. At the same time they want the complexity of networks, now and in the next-generation, removed. And that requires an advanced operating system – Symbian OS – to make it happen.

Symbian OS phones have laid the foundations of the solution to the so-called 'chicken and egg' problem that has affected mobile networks. (Which comes first: next-generation mobile phones, or the next-generation phone services for these phones?) The answer is that Symbian OS phones are compelling enough in their own right, for enough users, even independent of the existence of new data services. Their superior, integrated functionality sees to that. The popularity of Symbian OS, which enables all parts of the wireless value chain, will lead to increasing prevalence of advanced data services. In turn this will lead to the mass-market adoption of the Symbian OS phones on which these services run so well.

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