Lecture Summary 6: Windows Mobiles

We are considering Windows Phone, the mobile operating system from Microsoft. Observing Windows, from a company perspective, it is a late entry in an established market, currently only owning a 3% market share[1] dominated by Android and iOS. I'd like to see if this position, as well as other factors pertaining to their background and strategies might have influenced any of their design decision. In addition, we will observe what the good and bad qualities may be, inherently and in comparison to other smartphone operating systems, particularly Android. I'd also like to discuss Microsoft's broader strategies and chances of becoming successful in the smartphone market.

If I start by considering their background as the leading operating system provider for desktop computers. At the height of the dot-com bubble they were the most valuable company in the world in terms of market capitalisation at over 500B dollars [2]. This was a time before investors were able to predict profound changes in the landscape of networked computers, and the emergence of a contender to the desktop. Since then, two technology companies are rivalling Microsoft, they are Google, and Apple. Notably the trio represent the main contenders (and possibly the inclusion of RIM) of the market mentioned, which implies something wider beyond the smartphone market in isolation. Microsoft, Google and Apple all have hugely integrated strategies related to all aspects of personal computing. The valuations of these companies are divided between the smartphone market, desktop computers, and internet services. Considering these products collectively, we can see that each of the companies aim to offer complete solutions for all aspects of personal information management. If we chose one or the other, for example Google's email client, one becomes compelled to adopt all the other Google products, like the Android phone which synchronises seamlessly with their online services.

This realisation, I believe, is fundamental to Microsoft's smartphone strategy. Microsoft missed the boat in key advances of computing history. Notably internet search (Google), smartphones (Apple and Google) and social-networking (Facebook). Microsoft's hold on the computing world is mainly relegated to it's desktop product, which is becoming decreasingly important (slowly) because of it's loss of utility with respect to the smartphone, and thin-client paradigm of computing. To make up for lost territory they have invested heavily in a large vertical collection of information products, which we will see are almost all represented in some form in their latest smartphone operating system.

The latest version of Windows Phone is v7.5, codenamed Mango, recently launched in September 2011.

Homogeneity

Microsoft made several decisions to limit device heterogeneity. A major design choice is that the display is a common 800 x 480 pixels for all devices. There are requirements that certain sensor must exist, these include multi-touch input, high quality camera, GPS and motion sensors. The physical buttons are always the same on the Mango phones, these are sometimes labelled Back, Start and Search. There are also requirements on cpu, graphics processing and memory.

All applications that are published go through Microsoft's portal services, and must pass certification to meet certain quality standards. This gives users confidence that applications available on the marketplace are good, but may also restrict potentially useful ones from becoming available.

The hardware and application distribution strategies are both a homogeneous of nature. The hardware, from an

Figure 1: Windows Phone offers device homogeneity and rich a feature set. The Panorama feature shows a smaller region of a conceptually larger area.

application developer's point of view, make it easier to create consistent products. From a user's point of view there is homogeneity in terms of consistency, the products are all at Microsoft approved standard, and to some extend support Microsoft's branding strategy which represents quality and user experience. In this way users are also better protected from malicious software that, in comparison to the Android marketplace has looser controls and may pass through.

The strategy of device homogeneity is very similarly to Apple, which also has a branding reputation to maintain, and are largely proprietary.

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[1] http://en.wikipedia.org/wiki/Smartphone
[2] http://en.wikipedia.org/wiki/Microsoft

Runtime Environment

All smartphones have a runtime environment that runs at an abstraction that protects the integrity of the system. It is apparent from looking at features of the environment that Microsoft has an inclination to steer the developer towards an integrated suite of Microsoft products. All the following are proprietary; the development language is C#, and the preferred development environment is Visual Studio. The runtime is provided by either of two development frameworks, Silverlight for applications based or event-driven UI controls, or XNA for graphics-orientated applications, such as games. UI layout and properties are specified by the mark-up language XAML.

In (an entertaining) comparison to Android, all aspects are perfectly mirrored by open-source products. Java as the development language, Eclipse as the primary IDE, and XML (a W3C recommendation) for building user-interfaces. One minor difference is that Android only provides a single supported SDK. Microsoft is taking a slightly higher-level of abstraction that necessitates the branching of their SDK, but the two support much of the same set of features. For example page-based navigation, a method (similar to URLs) of passing control between applications to predefined states.

Android's current release 4.0 (Ice Cream Sandwich) comparably to Mango includes a rich set of features. Since Android is an open source mobile operating system, the community is welcomed to collaborate in the development of the programming environment, the operating system and the API.

User-Interface

The user-interface methodology is pretty equivalent to other systems. The interface-theme is called Metro and is predominantly designed in dark colour to save power. The backdrop is arranged by tiles (which is also a planned feature of the next desktop version of Windows[3]), that are used instead of the familiar icons by Android or iOS. Tiles can animate and provide status updates by the represented application. Two innovative navigation controls are the panorama and pivot[4], both are new ways of viewing smaller parts of a conceptually larger collection of information (see figure 1).

The panorama and pivot features are marginal improvements, so it's difficult to believe that they will fall in strong favour in terms of market adoption. It looks most like an attempt to create a unique selling point, in terms of branding creating a look-and-feel that allows association to Windows. In Android developers would have to implement exactly this feature in an ad-hoc manner, there is library support for scrolling between viewports.

Discussion

The runtime environment tries to make up for a high level of abstraction by a rich feature set, both related to on-phone operations and in conjunction with external services (predominantly by Microsoft). A partial list of features are related to social interaction, search, office, photo management, multimedia, etc, The ecosystem of services and features is interconnected and self-supporting, for example Microsoft's cloud services, Azure, provide utilities such as the map interface, notifications and social identity and interaction (implemented by Live[5]).

All of these developments are in matched contrast, as mentioned, to information and communication products remarkably similar to product suits provided by Google and Apple.

In comparison Microsoft is most similar to Apple, Google representing the good-guys (open-source). Based on observations on marginally successful strategies by Microsoft to capture various strategic markets in the past, such as social-networking (Live), search (Bing) and email (Hotmail), and also note they are steadily losing traction on their browser[6].

I would think the market conditions of smartphones are analogous compared to these ventures, as a speculation, possibly the inherent problems are related to the hugely proprietary nature and encompassing strategies. Personally, I feel locked-in when using Microsoft products, mainly because of sense of an inherent antagonism towards other products, due to general incompatibility and difficulty converting between formats.

Compared to Android, the two most relevant points are their different in market adoption, and their open-source nature. The market penetration is problematic for a developer mainly because one only reaches a limited audience. Community support is also less present. The open-source nature makes a big difference, there are almost no advantages I can think of where a closed-source system should be better. One small reason may be because it offers safer user-experience, but that is not a concern for an information-aware individual. Certainly, Microsoft can do all the stuff that Android or iOS can do, which is

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[3]http://en.wikipedia.org/wiki/Windows_8
[4]http://www.ditii.com/2011/05/25/intrducing-windows-phone-7-panorama-and-pivot-controls/
[5]http://en.wikipedia.org/wiki/Live_Services
[6]http://en.wikipedia.org/wiki/Usage_share_of_web_browsers

one of interesting aspects of smartphones that a diversity of platforms can meaningfully exist. Based on this fact, there is are no large barriers for Microsoft to grow to some extent.

Notably, Mango doesn't support any tables, but I expect we will see one any time soon?

References

[1] Tor-Morten Grnli, Jarle Hansen, and Gheorghita Ghinea. Android vs windows mobile vs java me. *Proceedings of the 3rd International Conference on Pervasive Technologies*, 2010.