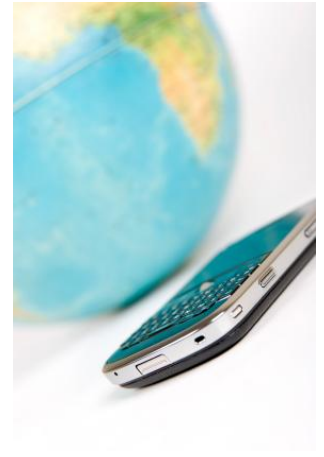

Your next BMV will come from an app store...

Northstream White Paper

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Digitization and the internet are increasingly freeing Books, Music and Video (BMV) from physical delivery media and channels. Until recently, wireless delivery of digital experiences was hampered by non-user-friendly devices, non-interoperable distribution platforms and oligopolistic distributor behaviour. Apple addressed these obstacles and created a thriving business for application developers and service providers generating “Over The Top” revenue (i.e. outside mobile operators’ reach). The “application” of mobile interaction and consumption of digital content and services, whether it is text, audio, video or gaming, navigation or banking, has launched an extraordinary and disruptive change in the mobile internet ecosystem. While new powerful and user-friendly “application-oriented” smartphones have enabled device manufacturers to take an even more central role in the end-user’s mobile service experience, global online service providers have leveraged their scale and skills to offer compelling communication and content services over operator “bit pipes”.

Operators are responding to these events in various ways. Lack of scale and challenging legacy revenue models prevent many operators from securing additional margins through application development and sales, as should have been learnt by previous operator attempts on mobile portals and developer programs. Instead, by acknowledging the device lead in customer relationships, operators can stay focused on and excel in their core business. Primarily, operators should address applications just as application developers, through packaging controllable assets into a selling user experience. Pre-installing applications for

customized access to account and service management is one way of ensuring a more active subscriber relationship.

Still, the current media attention on application provisioning risks clouding operator judgment and diverting attention from the media delivery channels that address much larger shares of existing mobile phone users, i.e. SMS and MMS. These hold the potential of delivering value and generating revenues more cost-efficiently for most operators. Further, the building of application stores does not in itself solve the long-standing challenge between operators and content providers on how to distribute revenues, i.e. to define the value of aggregation, presentation and distribution.

Looking forward, new media experiences will successfully be delivered by those who engage end-users in a social context and evoke passion and commitment. By virtue of being closest to the device and acting on a global scale, device manufacturers are well positioned to orchestrate an application world that benefits all ecosystem members. Players that try to limit creativity for the benefit of old business models will lose out as new revenues become associated with advertising, social networks, devices, platforms, and clouds.

Application stores – What are they?

Media attention on the mobile industry seems to have lost all proportions in reporting and discussing application stores. The number of downloaded applications from Apple’s App Store is duly reported without analyzing the contents of those “applications” and without putting total application revenues into the perspective of overall mobile industry numbers. Surely, we are witnessing a hype when the total value of all applications sold in all application stores in the US in 2009, \$343 million, corresponded to less than 0.5% of all 'non messaging' premium content (music, gaming, news, etc) consumed in the mobile world but still it is the applications that get attention.¹ Basic ringtones alone are still generating some \$5 billion in annual revenues; more than ten times the application revenues and delivered outside of application stores.²

The current hype surrounding application stores seldom makes a distinction between applications and application stores. Neither is new. Apple simply revitalized an existing concept.

Software suppliers have had dedicated websites (“application stores”) for download of mobile software (“applications”) for years, accessible both from desktops and smartphones. Nokia, the world’s leading smartphone supplier, had Software Market for smartphone users’ purchase of software and now has its Ovi Store. Handango, a mobile content provider, has a long-established software shop (it is in fact distributing its 140.000+ applications via its content partners and when judged by these numbers it could be considered as the world’s leading provider of smartphone applications³). Mobile operators in most developed countries have had portals for selling and providing software to their customers. However, none of these efforts have come close to the number of applications and downloads generated by the Apple App Store phenomenon.

| Company | Store/Platform | Launch date | Developer share of revenues |
|---------------|--|------------------|-----------------------------|
| NOKIA | Ovi Store | May-09 | 70% |
| SAMSUNG | Samsung Application Store | Oct-09 | 70% |
| LG | LG Application Store | Jul-09 | 80% |
| PALM | Palm App Catalog (Palm Software Store) | Jun-09 | 70% |
| RIM | BlackBerry Application Storefront & BlackBerry Application Center | Mar-09 | 80% |
| APPLE | App Store | Jul-08 | 70% |
| SONY-ERICSSON | PlayNow Arena* | Jun-09 | 70% |
| ANDROID | Android Market | Oct-08 | 70% |
| AMDOCS | Amdocs Interactive App Store | Feb-09 | 80% |
| COMVERSE | Converse HUB Application Store | Feb-09 | - |
| SURFKITCHEN | SurfKit Platform (<i>Application store enabler</i>) | Apr-09 | - |
| GETJAR | GetJar application store | early 2005 | All apps are free |
| HANDANGO | Handango App Store Accelerator (<i>application store enabler</i>) | Mar-09 | - |
| MICROSOFT | Windows Marketplace for Mobile | Oct-09 | 70% |
| GOOGLE | Checkout & Google Wave app store | Not launched yet | - |
| QUALCOMM | Plaza Mobile Internet/Plaza Retail (<i>white label application stores</i>) | Jul-09 | - |
| ORANGE | Orange Application Shop (3rd party managed) | Apr-09 | 70% |
| CHINA MOBILE | Mobile Market | Sep-09 | - |
| TELEFONICA | Mstore | Sep-09 | - |
| VODAFONE | 360 | Oct-09 | 70% |
| O2 | O2 Litmus store | Late 2008 | 70% |
| T-MOBILE | web-2-go (re-vamped from T-Zone) | Nov-08 | ** |
| VERIZON | Verizon Vcast App Store | Q4 09 | 70% |
| TELSTRA | TelstraOne Experience (<i>co-operating with SurfKitchen</i>) | Not launched yet | - |

*PlayNow music and content download service available on Sony Ericsson mobile phones since 2004
 **T-Mobile will take a percentage of revenues based on bandwidth.

Table 1. An overview of the application stores
 (Sources: company webpages, news articles, Morgan Stanley)

1 Sources: Yankee Group and Portio Research
 2 Source: Juniper Research

3 Source: Handango Press release 31st March 2009

What is new with the current crop of applications and application stores heralded by Apple is the device (iPhone) user-friendliness of presenting and provisioning software combined with a payment platform (iTunes) plus the creation of an ecosystem based on a Software Development Kit (iPhone SDK) and developer support program (iPhone Developer Program). Consequently, it is not the application store per se that is the substance or innovation; it is what is behind in terms of user interface, device capabilities, limited fragmentation, development support, and market reach.

Application stores hold revenue potential for mobile operators, but there are several types of actors competing to get a share. The competitive landscape for operators has changed as they no longer only compete with other operators for this additional revenue, but also with the device manufacturers, mobile OS providers, and online service providers, among others. E.g. Nokia is re-defining its relationship with operators and is aggressively seeking a share of these new revenues: *"I'd like to earn a piece of every transaction in the world that happens with this device"* (Tero Ojanperä, Nokia, September 2009). Apple is also pointing to a new era of device centric markets where they see themselves as the key end-user interface instead of the operator: *"Apple works with network providers around the world so that iPhone users have access to a cellular network"*⁴.

Apple's success in providing 3 billion application downloads in less than 18 months has spurred competing mobile OS providers and operators to imitate the App Store model⁵. These actors have made different efforts to improve user-friendliness, decrease fragmentation, reduce commissions and eliminate the need for credit card charging by enabling SIM-card based charging.

Who should be offering application stores?

Market actors offering application store solutions can roughly be categorized into three groups: Platform (mobile OS/handset) application store providers, third party storefront providers and mobile operators.

Next to Apple's proprietary application store and ecosystem based on the iPhone platform, there are platform application stores, e.g. based on Symbian or Android, which rely on a larger degree of openness in the platforms. Platform application stores are generally associated with the device manufacturers and ensure that the applications work

on specific devices. Thus, platform application store providers are not bound by national boundaries but address global customer bases. Platform application stores are likely to grow in importance for both end-users and device manufacturers. They will increasingly compete with national operators by offering multinational end-user access to application developers.

Third party storefronts are usually offered by content aggregators who try to grasp across multiple platforms and offer operator-independent content. Historically, these application stores have struggled with unfavorable operator revenue sharing agreements and limited marketing capabilities. Going forward, they may be facing even bigger challenges, as they neither control the platform nor do they have as close a relationship with the end-user as operators do. There may be some individual niche offerings that prove to be successful, but it is difficult to see third party storefronts dominating the application store market.

Operators have the benefit of their own charging capabilities and a trustful customer relationship but have to consider supporting applications for a diverse set of devices to reach large customer numbers.

Unfortunately, we see fragmentation in the device space increasing rather than decreasing and operators not being able to ensure an integrated application ecosystem. Thus, device choice looks certain to define access to applications.

When considering the critical mass of addressable end-users needed for an application store to be successful, the global operators have customer bases of tens of millions but the average share of smartphone users is still only around 3%⁶ of total mobile users. In some markets this may build up to a large enough user base, but most operators would struggle considerably if trying to profitably build an application store, as operating on their own they would simply not have enough smartphone customers. For these operators, the solutions lie between a partnership with another operator or using a third party storefront, or they could of course choose not to participate in the application store business. One challenge in using a third party offering is the low control of what is actually offered. Some larger operators may evolve their experiences in developer programs, using the application store focus on user-friendliness to guide developers into an operator branded storefront of applications

⁴ Source: Apple in response to an FCC inquiry of July 2009

⁵ Source: Apple press release 5th January 2010

⁶ Source: RBC Capital Markets research: Wireless Industry – Sizing the Global Smartphone Market, Nov 12th 2008

supported by the charging capabilities of the operator.

Large global operators may benefit from their scale and reach, but are still dependent on national level agreements and adjustments to their application store offerings, which will create more costs and very likely delay the store launches. As always there are at least three aspects for all operators to consider: costs, revenues and strategic positioning. The investments for establishing an application store are not overwhelming compared to other service network and BSS/OSS systems. However, the operational expenditure can be substantial if the number of supported smartphones and application types are not limited. Similarly, the costs for enabling APIs and establishing & managing developer support programs are also substantial.

Application revenues are subject to the revenue share captured by operators. The industry norm of 30% is likely to hold for a while and is in Apple's case generating an estimated revenue of \$0.89 per application.⁷ To this should be added the traffic revenue currently embedded in the mobile data plans of mobile operators. All in all, total application-related revenues must be large enough to support an often small and fragmented user base, application developers and the hosting of less successful applications. Which long-term revenue share that can sustain operator profitability is unknown, but in either case it is safe to say that large volumes are needed.

Last, the strategic positioning of an operator may warrant an application focus. An operator may want to differentiate in the market by aiming for high-ARPU generating smartphone users. This type of niche strategy is increasingly questioned by the market as the profitability of serving high-ARPU customers generally is lower than for serving low-ARPU customers.

Thus, most operators are well advised to carefully consider their priorities before focusing too many resources on applications (software for smartphones) and application stores. If customer reach is prioritized, there is still much to be done in using SMS and MMS to provide content owners with ready access to large numbers of end-users. Focusing on the capabilities of basic phones and feature phones will in the short- & mid-term be a more revenue-generating and cost-efficient strategy for most operators. AT&T's recent initiative to use the BREW platform for reaching mid-range "quick messaging devices" indicates that even a leading iPhone provider and supporter has an appetite for offering applications to a larger number of users using a competing platform.

| | Assets | Challenges |
|---------------------------|---|--|
| Platform providers | <ul style="list-style-type: none"> ▪ Ease of discovery ▪ Large user base (global) | <ul style="list-style-type: none"> ▪ Limited to one platform |
| Third parties | <ul style="list-style-type: none"> ▪ Platform/(operator) agnostic | <ul style="list-style-type: none"> ▪ Marketing & visibility might be an issue ▪ Challenging to support several platforms (no control over the platform) ▪ No close relationship with the end user |
| Operators | <ul style="list-style-type: none"> ▪ Wealth of CRM data ▪ Direct/flexible billing facilities ▪ Global/multi-country operators have large customer bases (relationship & trust) | <ul style="list-style-type: none"> ▪ Costly to create an application store for multiple devices/OS's - Single country carriers might not afford to build their own platform |

Table 2. Different types of application store providers and their inherent assets and challenges

⁷ Source: 148Apps.biz

Parallel to using SMS and MMS channels for content distribution, operators can use existing platform application stores as a "shopping window" for concentrated application efforts. E.g., creating "operator applications" and making these available in multiple platform application stores. Operators can also offer self-care functionality for account handling and other administration/operating functions for operator services, e.g. remote control handling of IPTV offerings, enterprise accounts, MVPN. The self-care application can feature promotions and can also be linked to a loyalty program.

Another question then is whether it is enough for the operator to have a critical mass of smartphone users, since the other, and probably bigger challenge, is the variety of smartphones, even within the same operating system, with different screen resolutions, processors, etc. That variety can be too large for cost-efficient application development and provisioning, even when using someone else's application store.

Concluding, it is still very likely that many operators will attempt to establish application stores, especially given that the projected application revenues are so alluring. It is estimated that over 420 million smartphones will be sold in 2013, reaching one third of the total mobile penetration and paving way for a global mobile application market worth over \$16 billion⁸. Thus, on an **aggregated** level there is certainly revenue to be distributed. However, this should be compared to the current total mobile data revenues of \$284 billion.⁹

To who are applications targeted?

Smartphone users are considered to have several characteristics distinguishing them from "regular" phone users. According to RBC¹⁰ smartphone users are more data centric than voice centric in their usage and also tend to upgrade their devices more frequently than regular phone users. The latter could also be related to smartphones often being heavily subsidized, facilitating for end-users to upgrade their devices. More data centric phones has lead to increased revenue levels, which again makes it more desirable for operators to keep smartphone customers and hence subsidize smartphones more heavily.

8 Source: Cellular News - Mobile Application Sales to Hit \$16 Billion Per Year by 2013, Sep 24th 2009
 9 Source: Morgan Stanley
 10 Source: RBC Capital Markets research: Wireless Industry – Sizing the Global Smartphone Market, Nov 12th 2008

We are still in the early days of the smartphone evolution. Going forward, device manufacturers will make more and cheaper smartphones, and operators are likely to subsidize them more because of attractive data and application revenues. With increasing selection, smartphone users as a group will become even more heterogeneous than they are today.

What should be offered, and how, in order to be successful?

The success of the Apple App Store has unleashed an unimagined creativity in providing software that expands and enhances the user experience of a mobile computer. Just as recent application successes were unforeseeable, tomorrow's success will stretch our imagination in combining the richness of the internet with user positioning and communication possibilities. At the core of this success, however, are a couple of key success factors of the application store itself that must be addressed by application store competitors: User experience, device capabilities, minimized fragmentation, development support, market reach, and traffic cost independence.



Figure 2. App Store showcase (Source: Apple)

To start with, the integration between applications and the device capabilities themselves is of course essential in enabling a positive user experience. The quality assurance of this integration is best performed by device manufacturers, independent of the application provisioning channel.

Subsequently, ease of discovery, payment and downloading are key elements for creating an attractive customer experience. 90% of the browsing

for new applications is done on-device¹¹, so it is crucial that the user interface offers smooth interaction – not forgetting that there also needs to be a sufficient selection of applications to choose from and that these applications need to be kept up to date. The device itself here is the key, hence raising the question whether operators are in fact in the best position to offer application stores as they are not in full control of the device. Currently, device manufacturers' efforts to create even more attractive devices with ever more capabilities are leading to an increasing number of software platforms, which is leading to increased fragmentation. This ends up being a considerable stumbling stone for application store success.

Ease of payment can be offered by operators by associating application store consumption with the SIM card and subscription entities, elegantly making away the need for a credit card based account. The smooth payment method with a trusted entity supports impulsive application purchases, but it also complicates for private purchases on company phones. For this payment method to be attractive for third parties, operators must offer payment terms that are competitive with those of credit card companies and enable multiple purchase accounts.

Unfortunately, most operators are challenged by lack of market reach. Reaching less than 30% of a single country's population makes smaller operators unattractive to work with for application developers and other third parties, e.g. multinational consumer brands, since these have to interact with so many parties to achieve market reach.

Will the application stores live long or is this just a fad?

The smartphone market continues to grow, despite tough economic times. According to IDC in the third quarter of 2009 the global shipments of smartphones increased by 4.2% compared to the same quarter in 2008¹². Smartone CEO Douglas Li announced in November 2009 that the number of smartphone users in their network rose by 70% from last year¹³. While the bulk of devices sold in the coming years will continue to be basic phones and feature phones, these figures confirm that smartphones are taking an increasing market share in developed markets.

11 Source: AdMob Mobile Metrics Report, July 2009
 12 Source: Newsfactor - World Smartphone market Grows Despite Economy, 6th Nov 2009
 13 Source: Telecoms Europe - SmarTone places its bets on smartphones, Nov 27th 2009

For obvious reasons, online service providers want to believe that the application stores will not live long and that mobile versions of web-services or direct bit pipe access to cloud-based content and services will win in the longer term. Google claims that in the long run the open browser model will win; *"Closed systems grow quickly while open systems evolve more slowly, so placing your bets on open requires the optimism, will, and means to think long term. Fortunately, at Google we have all three of these."* Mozilla has also launched Firefox Mobile to build what they call "browser as an OS" concept. This would allow developers to create applications for the browser rather than separately for each mobile OS.¹⁴

The longevity of these sometimes complementary, sometimes substituting, alternatives cannot be judged at the present. Still, it is safe to say that all alternatives are using the Apple App Store success as a benchmark for how mobile computer accessed content and services can be packaged, presented and provided in an appealing and stimulating way. Irrespective of whether customer experiences will be packaged into downloadable software or provided "in the cloud", the paradigm of selling these experiences as "applications" in an "application store"-format will stay with us for a while.

End-users will continue buying their BMVs where they get most "bang for their buck" and this consideration will be increasingly important in the overall customer experience evaluation of new devices. Application stores are not a new savior for building operator non-voice revenues. The Apple App Store success confirms previous learnings about Mobile Portals and Mobile Software. Only when key elements, covering end-to-end user experience, user interface, payment, software development and distribution, access to network functionality, are all in place, can new revenues be generated for new customer offerings. The needed cost efficiencies, when threatened by device/mobile OS fragmentation and overall customer base size, can only be achieved when each value web actor focuses on its core assets and expertise. For the mobile operator this still means to increase its understanding of the core values of its customer relationships and network functionalities, and to offer these to third parties in a mutually beneficial way.

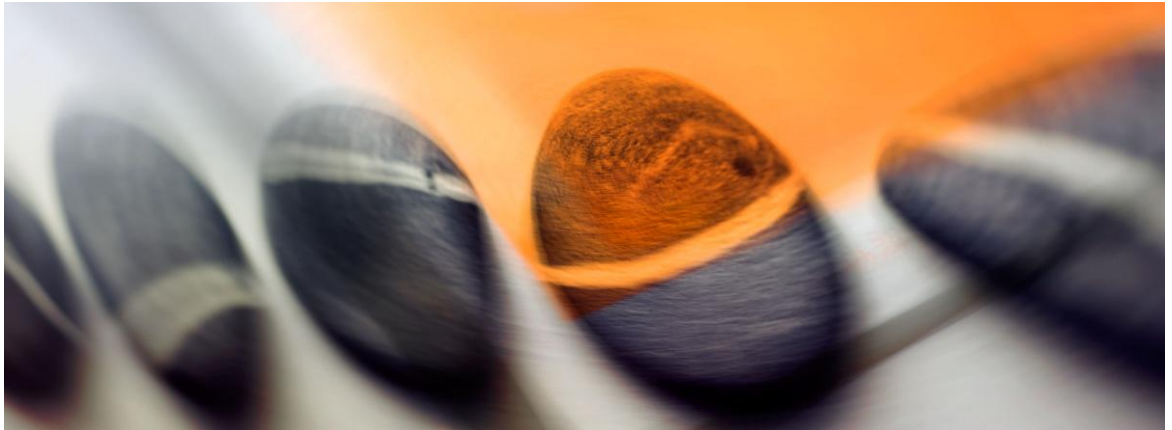
14 Source: Rethink Wireless - App stores will have short day in the sun, says Mozilla, Dec 22nd 2009

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