

An Oracle White Paper
March 2011

Java ME - Asia Opportunity

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Executive Overview

There are more than 3 billion Java ME enabled mobile phones worldwide, and a large proportion of these are feature phones used in Asia. As the feature phone has become more powerful and data plans have gone mainstream, application usage across the region is booming. Therefore, the Asian market represents a large opportunity for mobile developers to create and distribute apps for the Java ME application runtime environment.

Objective

The purpose of this whitepaper is threefold:

- To inform readers about the current status and future growth trends of Java ME in the Asian sub-regions of Greater China, India and Southeast Asia.
- To encourage further development of Java ME applications
- To identify a valuable list of resources & tools to assist in the creation and distribution of Java ME applications in Asia

Audience

- The primary audience for this whitepaper is Java ME developers
- The secondary audience consists of Asian-based operators, handset manufacturers, third-party application stores, or other industry stakeholders looking to understand the needs of Java ME developers better

Scope

- After reading this whitepaper, readers will have a high level understanding of the market opportunity in Asia for Java ME mobile applications

- Readers will also have an initial list of resources and tools that can immediately be utilized for Java ME application development and distribution in Asia

Future Resources

- Country-specific details and guidelines for distributing Java ME applications in Asia will be provided in future “how-to” guides

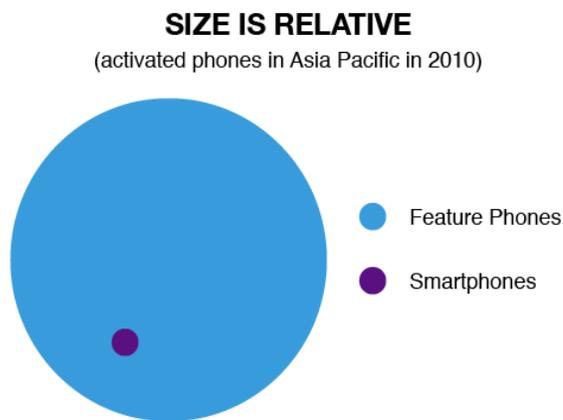
Opportunity

State of the Feature Phone

Today, with all of the hype about smartphones, it is often forgotten that approximately 85% of the worldwide mobile phones shipped are feature phones. The reason for this lies in the confusion about definitions. Features that before were once hallmarks of smartphones such as touch screens, cameras and GPS, are now often available on feature phones as well, thus blurring the smartphone and feature phone categories.

Figure 1 Smartphone penetration relative to feature phones¹

In general, the feature phone is considered a relatively low to mid-range mobile phone with less computing ability than a smartphone, but with more capabilities and functionality than a voice only phone. Most feature phones are capable of running apps based on cross-platform application runtime environments such as BREW or Java ME. Unlike with smartphones, apps that run in these native environments can run across various operating systems (OS). However, feature phones usually lack the



ability to run native software, resulting in less integration with the underlying OS.

Java ME enabled phones

Based on January 2010 estimates there are more than 3 billion Java ME enabled mobile phones worldwide² making it the most broadly distributed mobile application runtime. The most notable handset manufacturers that support Java ME enabled phones include Nokia, Samsung, LG Electronics and Sony-Ericsson. Often the hardware design is hard to distinguish from those of smartphones.

¹ EXICON Research – <https://www.cia.gov/library/publications/the-world-factbook/> <http://www.beyond4g.org>

² Learn about Java technology - <http://www.java.com/en/about/>

“Our decision is obvious. There are far more Java ME enabled devices in the world than all the others put together”

Leading Indian App Developer



Figure 2 Recent Feature Phones by Sony Ericsson, Nokia and Samsung

Because of the vast number of Java ME enabled phones, app development for the platform represents a significant market opportunity for mobile app developers. With minimal code modifications developers can reach hundreds of millions of feature phones.

Looking at statistics from GetJar, the world’s second largest applications store, it becomes clear that Java ME is thriving in the global mobile apps trend. With close to 3 million daily downloads worldwide and a year-on-year growth of 133% the data provides a clear indication of the success of the platform³.

³ GetJar Developer website - <https://developer.getjar.com/analytics/coverageTrends/?viewDataBy=2>

"50 percent of downloads are Java ME applications. Our user base in Southeast Asia has not been affected because the adoption of smartphones is simply not there"

Patrick Mork, CMO, GetJar

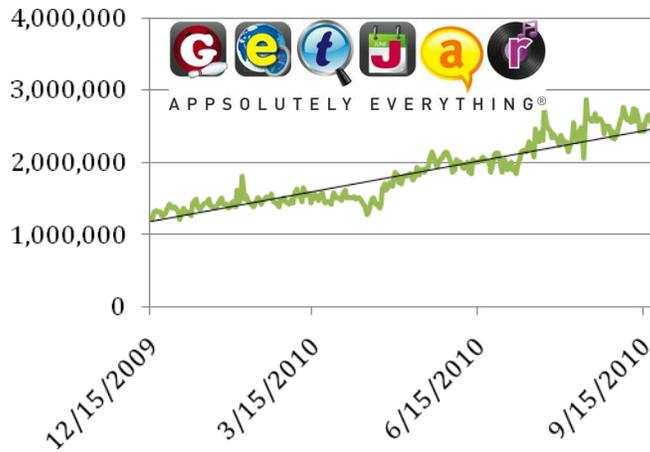


Figure 3 Global daily Java ME App downloads from GetJar

Drilling down on GetJar's and other application stores download numbers indicates that a large number of the application downloads are coming from emerging markets. For GetJar this even means that close to one third of all downloads come from India.

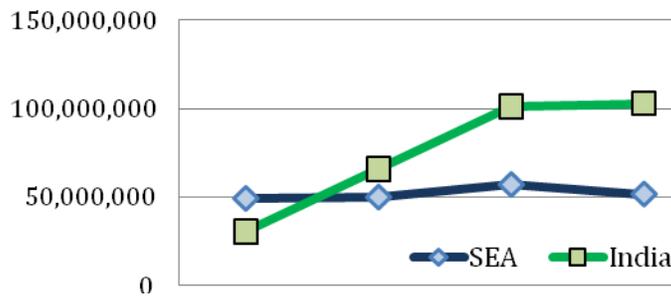


Figure 4 Quarterly App downloads in Southeast Asia and India from GetJar

Asia Opportunity

Feature phones have a commanding market-share in key regions such as Greater China, India and Southeast Asia. In fact, most Asian countries continue to have limited smartphone penetration. Affordability is the main reason for people to choose a feature phone over a smartphone and expectations are that this will not change any time soon. For example, in India, the ratio of feature

"We develop for Java ME because it makes sense business-wise..."

Top Malaysian Developer

phone users to smartphone users is 18 to 1 and in Southeast Asia, it is as high as 37 to 1. Overall, more than 50% of the total Southeast Asian population possesses an activated feature phone.

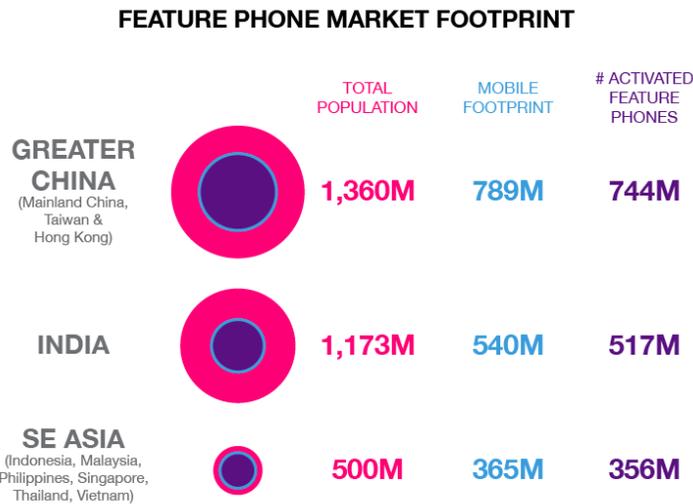


Figure 5 Feature phone footprint in Asia⁴

The picture above (figure 5) highlights the sheer size of the feature phone market across three key Asian regions. The number of activated feature phones can be derived based on industry estimates for mobile phone and smartphone penetration. Given the relative low mobile penetration there is enormous growth potential.

As 3G networks are rolled out across the region, competitively priced data plans are becoming mainstream. In countries like Indonesia and Malaysia mobile subscriptions now often include affordable data plans. This is illustrated when looking at the number of users of the popular Opera Mobile and Opera mini browser in the region, which more than doubled to 100 million in less than a year⁵. Expectations are that India and China will follow a similar growth pattern as some of the frontrunners in Southeast Asia.

⁴ EXICON Market Research – World Factbook CIA/ Beyond4g.org - <http://www.exicon.mobi>

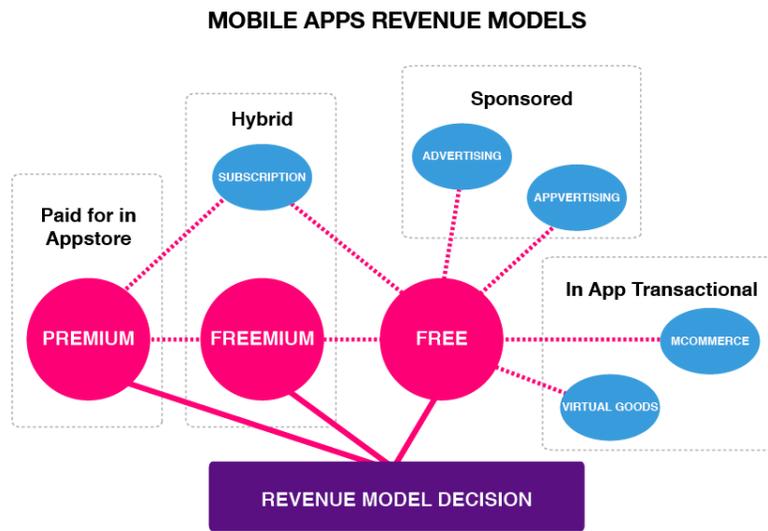
⁵ State of the Mobile Web - <http://www.opera.com/smw/2011/01/#feature>

There are currently approximately 45,000⁶ Java ME apps available across the various distribution channels. However, it must be said that as the feature phone continues to become more powerful with a bigger screen and stronger processor, some of these apps have yet to be optimized for the latest models and this is presenting an opportunity for developers to satisfy increasing consumer expectations with new, compelling Java ME applications. The tremendous growth of data plans for feature phones combined with the ever-increasing hunger for apps is also creating a huge supply/demand gap. Developers have started to acknowledge this opportunity as the number of app submissions to the regional app stores is on the rise.

⁶ Vision Mobile- <http://www.slideshare.net/andreasc/mobile-megatrends-2009-visionmobile>

Business Models

When feature phones were first introduced, mobile applications primarily leveraged royalty-based business models due to the propensity to pre-load applications on-device, through device manufacturer and operator relationships. Later, when data enabled networks were introduced and operators got into the apps retailing business via their WAP portals, deck placement became the alternative route to getting apps to the consumer. As dealing with the operators was often time consuming, aggregators and publishers entered the scene as middlemen, offering faster time to market for a percentage of the revenue. When app usage started to take off, WAP portals matured into application stores and handset manufacturers, technology vendors and independent players joined the space. Today, there are close to 100 different application stores worldwide with hundreds of thousands of apps. Competition among developers has become fierce and most have started exploring alternative revenue



models

Figure 6 Mobile Apps Revenue Models

Figure 6 shows the revenue models mobile app businesses can choose from. The three main models discussed in this white paper are: 1) Premium, which is paid for in application stores, 2) Free, revenue comes from alternative sources such as advertising or mCommerce, 3) Freemium, a combination of a Free basic service and a for-pay Premium service.

Premium

The Premium revenue model, in which developers sell their apps through application stores, has proven to be successful for many mobile app businesses. However, as the market is becoming more crowded and many consumers are not prepared to pay for mobile apps, competition is increasingly focused on price, resulting in negative price spirals.

Figure 7 shows the average selling price per app is relatively low in Asia. However, it is the enormous quantity and rapid growth rate of app downloads that really indicate the true potential of the region.

Based on the prediction of year-on-year growth of 50%+, expectations are that by 2012 app downloads in Asia will top 14 billion, equal to the number of downloads in North America and only second to Europe⁷.

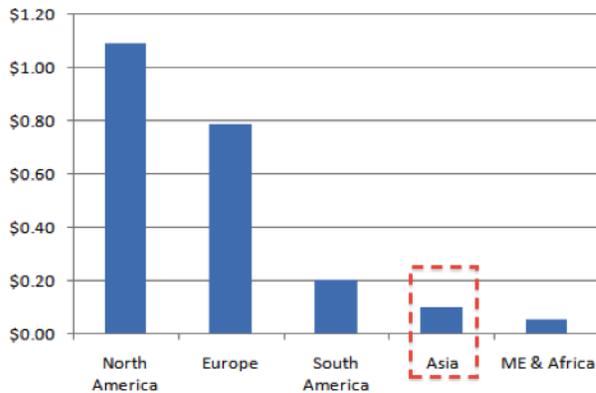


Figure 7 Average Selling price per App (USD)⁸

Free

Sponsoring, or advertising, is becoming increasingly popular as the dominant business model for mobile apps. Although, currently most of the worldwide digital ad spending is allocated to online media, mobile is on the rise. In Asia particularly, mobile advertising has a high growth potential in the next few years.

TABLE 1 COMPARISON OF 2010 TOTAL DIGITAL AND MOBILE AD SPEND⁹

REGION	CHINA	INDIA	SE ASIA
Digital Ad Spend, including mobile (US \$M)	4,464.0	117.0	52.0
Mobile Ad Spend (US \$M)	180.0	35.4	15.6

⁷ GetJar commissioned research by Chetan Sharma - <http://www.getjar.com/about/pressrelease/getjar-reveals-that-mobile-apps-will-outsell-cds-by-2012/>

⁸ GetJar commissioned research by Chetan Sharma - <http://www.getjar.com/about/pressrelease/getjar-reveals-that-mobile-apps-will-outsell-cds-by-2012/>

⁹ ADMA/ Nielsen Research - <http://www.asiadma.com>

Table 1 illustrates the 2010 mobile ad spend in Greater China, India, and Southeast Asia and compares those numbers with the current total digital ad spend. As more end users spend more time accessing data services via mobile handsets, advertisers will have a greater incentive to allocate budgets towards mobile advertising. Global app revenues from advertising are expected to rise to 28% of global app revenue by 2012. This is largely thanks to the rapidly increasing demand for “no cost” applications in the emerging markets. In addition, free applications have the opportunity to benefit from greatly increased distribution, generating significant opportunities for advertising or “freemium” business models (more on this topic, later).

Although most ad networks primarily support browser based ads, some have specific SDKs for Java ME Apps as they recognize the revenue opportunity from ads delivered to feature phones.



Figure 8 Ad networks with Java ME specific support

Some of the more successful ad networks include Adfonic, Vserv, MADS and MobGold. They all support in-app ads specifically for the Java ME platform. As they continuously increase their ad inventory, some of their developer and publisher partners have already been very successful with advertising funded models.

As brand directors are becoming more familiar with mobile as an effective channel to reach their target audience, a new app category referred to as “App-vertising” or “Branded Apps” has begun to emerge. Because branded apps are usually developed on consignment, this trend offers new revenue opportunities for developers.

Particularly in Southeast Asia, alternative business models such as “Mobile Commerce” and “Virtual Goods” have started to make their way onto the Java ME platform. Usually these in-app transactions are processed via premium SMS at the mobile operator.

Freemium

Freemium business models offer a basic product or service free of charge while charging a premium for advanced features, functionality, or related products and services. These models often use an advertising funded model on the “Free” version of the app and offer a paid upgrade to the Premium version. In addition, some application developers also focus on monetizing “in-app purchases” of add-ons or virtual goods. Especially in Asia, where the average price paid for apps is relatively low, the Freemium model offers alternative way to generate revenue for developers.

Success Story



Distribution
In Asia, the mobile

Description: Snaptu is a free cloud-based mobile app platform which “turns any mobile phone into a smartphone”. It allows users to access Facebook, Twitter, Flickr, as well as entertainment news, blogs, sports and local guides

Installs: >14 million with a large % of usage coming from Indonesia, India and Southeast Asia

Why Java: Java enables content providers and developers to write an application once and deploy it across many devices. Value of Snaptu’s platform is best realized by non-smartphones.

Business Model: Mobile advertising and products for content partners.

network operators are still the most important app distribution partners. Usually they account for the majority of sales and downloads of mobile content through their online and mobile application stores and portals.

However, recently the handset manufacturer operated app stores like Nokia’s Ovi have been gaining traction. As the number of apps on these stores continues to rise, some operators have chosen to let the handset manufacturers pre-load their storefronts on the phones in exchange for a cut of the revenue through operator billing. This saves the operator the trouble of having to operate a complete app store ecosystem.

DISTRIBUTION CHANNELS

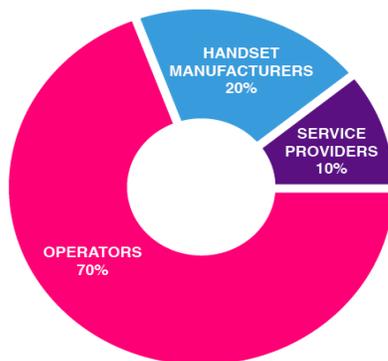


Figure 9 Asian App Distribution Channels Market shares¹⁰

In addition to the operators and handset manufacturers, aggregators play a key role in the Asian mobile app distribution landscape. Aggregators collect mobile apps from many sources and act as a central distribution point to the operator channels.

¹⁰ Annual reports - China Mobile/ SingTel/ Maxis/ Reliance

TABLE 2 REGIONAL AGGREGATORS AND OPERATORS

	GREATER CHINA	INDIA	SOUTHEAST ASIA
AGGREGATORS	Kong	Hungama Mobile	Elastias
	Sina	ImiMobile	Mobile Stream
	Sky-mobi	Onmobile	Moffy
	Sohu	Saregama	NEO
	Unicom WoStore		WooWorld
			
OPERATORS	3HK – Planet 3	Aircel – Pocket Apps	AIS – MobileLIFE
	China Unicom – Wo	Airtel Live/ App Central	Maxis – MiWorld Mobile
	Chunghwa Telecom - Emom	Reliance – R-World	Mobifone – mPlus
	China Mobile – 10086	Tata Docomo – 3G Life	SingTel – IDEA
	China Telecom – Tixa	Vodafone – Mobile App Store	Smart – Smart.com.ph

Often developers choose to deal with the aggregators only because it is simply too onerous in terms of time, money and effort to deal with the mobile network operators directly.

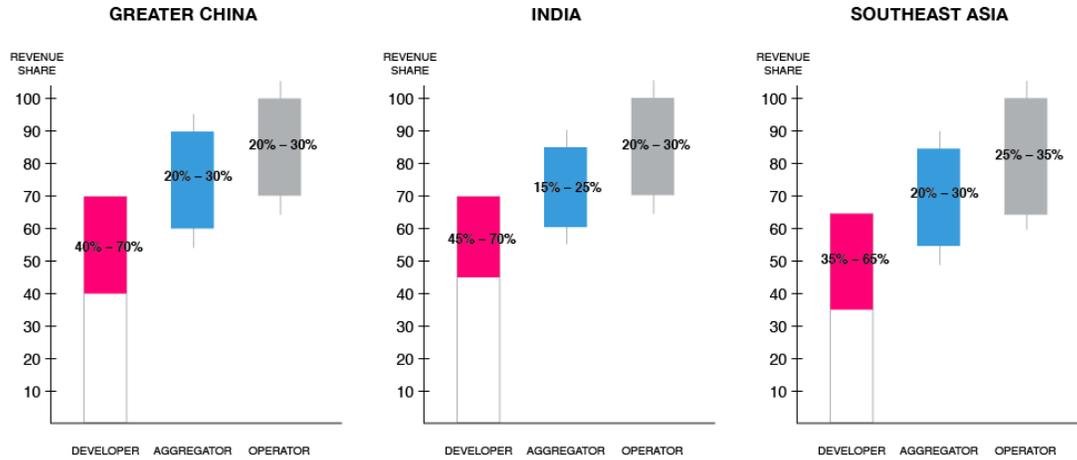


Figure 10 Typical Revenue Split (range) between Developers, Aggregators and Operators¹¹

As figure 11 shows, the revenue share percentages are somewhat different from what is commonly seen in Western countries. In Asia, these percentages are often the result of a negotiation process with outcomes that may vary significantly from one operator and/or aggregator to another. This type of business is still common and consistent across most of the Asia Pacific region.

In addition to the operator and handset manufacturer application stores, developers are increasingly adding alternative distribution channels to their business. The independent players such as GetJar, Appia and Handster generate a significant part of their (mostly free) app downloads from Asia, as the majority of their apps are targeted at the feature phone segment. And more recently, with the help of social media, developers have started promoting and distributing free and freemium apps on their own. One of the great advantages of Java ME apps is that their executables can be downloaded from anywhere and installed on most Java ME enabled devices, essentially by-passing any third party owned distribution channel altogether.

¹¹ EXICON Research - Operator distribution channel terms & conditions and aggregator interviews

Enterprise

One aspect of Java ME Apps rarely mentioned is their place in the emerging area of enterprise mobility. As increasing numbers of employees bring their own devices to work, they want to use their own mobile phones to accomplish work functions and not wait for the IT department to assign them pre-selected devices.

For a company to take advantage of its employees' mobile device usage and increase productivity, it will need to develop enterprise-focused mobile apps with robust and secure access to backend systems and databases. There is a growing opportunity to offer end-to-end enterprise mobility solutions via the Java platform. Recent enterprise software solutions such as Oracle ADF Mobile enable Java ME developers to integrate mobile apps with database and middleware technology using a unified framework without the need to write additional code on top of Java ME. These development frameworks also integrate additional features that are critical when implementing enterprise mobility solutions, such as additional security measures addressing user authentication and access control.

Resources and Tools

Oracle

Oracle offers a significant number of resources, information and SDK's via its online portal and Java developer community. Table 3 lists several key resources provided by Oracle and its partners that offer an extensive amount of information for Java ME developers.

TABLE 3 ORACLE JAVA ME RESOURCES ON THE WEB

RESOURCE	DESCRIPTION OF RESOURCES AND CONTENT	SHORTENED URL
Oracle Java ME Portal	This Java ME website serves as the overall "portal" into the latest information and documentation related to Java ME. This website is constantly updated to provide the latest news and developments about the Java ME platform	http://bit.ly/b10Q10
Java ME SDK	This website allows developers to download the latest Java ME software development kit (SDK) 3.0	http://bit.ly/cCZqd2
Java.net	The Java.net portal serves as the primary source for Java Technology Collaboration. It provides blogs, articles and a wiki (registration required)	http://bit.ly/iilp3l
JUGS	Java User Groups. A meeting place for Java users to share resources and solutions	http://bit.ly/3nQVF
LWUIT	The Lightweight UI Toolkit makes it easy to create compelling UI's that will look and behave the same on all devices	http://bit.ly/gRLcKq

Handset manufacturers, mobile operators and service providers in the mobile app ecosystem also offer a range of resources and tools to enable and facilitate Java ME development.

Operators

Most Asian mobile operators also provide resources to Java ME developers. Table 4 is a non exhaustive list of the key operators in the Asia Pacific region that are committed to supporting the Java community, along with the relevant shortened web URLs to their Java ME developer communities and support resources.

"We are happy with all the Java tools that are available to us"

Java Developer

TABLE 4 RESOURCES PROVIDED BY ASIA PACIFIC MOBILE OPERATORS

OPERATOR	DESCRIPTION OF RESOURCES AND CONTENT	SHORTENED URL
China Mobile Developer Network	Comprehensive Chinese Java ME source with Tutorials, API's, Support, Forums and SDKs	http://bit.ly/dEqTFU
China Unicom	Chinese Developer community website with links to SDK download and device specifications	http://bit.ly/f87FM7

Singtel MyAppsMall	Complete Singaporean developer website with Forums, Blogs, Code snippets and developer updates (registration required)	http://bit.ly/epfyIp
Maxis Sentral	Malaysian source for Java ME support, forums, blogs and links to SDK downloads	http://bit.ly/byq5Zn
Airtel Live	The first Indian mobile go-to-market channel available to third-party application developers who build mobile applications and wish to reach our 120 million customers (registration required)	http://bit.ly/gn2o4m
Reliance Developer Program	Indian website with API's, support, computer based training, SDK's and device specifications	http://bit.ly/fuwhtw

Handset Manufacturers

Because of their long-standing commitment to the Java ME platform, most major handset manufacturers provide their own resources and forums to assist Java ME developers. Table 5 lists the relevant URLs provided by the key handset manufacturers

"There is an abundance of Java developers to gain from..."

Enterprise App Developer

TABLE 5 RESOURCES PROVIDED BY HANDSET MANUFACTURERS

WEBSITE	DESCRIPTION OF RESOURCES AND CONTENT	SHORTENED URL
Forum Nokia	Leading Developer Community with active forums, SDKs, Device specs and testing tools, code examples and informative videos	http://bit.ly/9Uy6NE
Samsung Mobile Innovator	Device specs, SDKs, Tools, discussion boards, support and knowledge base	http://bit.ly/10n1Dc
LG Mobile Developer Network	Device specifications, documentation, SDKs, Forum and testing tools	http://bit.ly/279x4a
Sony-Ericsson	Device specifications, developer guidelines, documentation, APIs and links to SDKs	http://bit.ly/fhhTA6

Analytics Service Providers

In most Asian countries, the network operator has a tight control on the access to customer and app download data. In order to get good insight on app downloads and usage, analytics by third party providers are a good addition to the operator and/or aggregator data.

Although most application stores will provide high-level reports on app downloads and revenue there are numerous third party analytics service providers that offer deeper analysis of user behavior.

Companies such as Flurry and Appclix allow developers to download and integrate a small piece of code into their app to track how well the app performs.



Figure 11 App Analytics Providers

Appstore analytics providers Distimo offers developers free distribution channel and download analysis across most major application stores, including stores relevant to Java ME developers such as Ovi and GetJar. They also frequently release insightful reports on popular and upcoming content categories and appstore comparisons.

DISTIMO

Figure 12 Cross Appstore Analytics

For developers who take advantage of the advertising business model, further analytics are often provided by the ad network.

Java ME – The Right Platform for Asia

In the whitepaper above, the market opportunity in Asia for Java ME application development has been discussed in detail. This section will specifically address the advantages of Java ME and will raise awareness of any challenges of developing applications for the platform.

Advantages

Based on surveys and interviews with award-winning and featured developers in Oracle's Java development community, the top reasons why developers choose to develop for Java ME phones are the following:

- Ability to leverage Java development knowledge
- Fastest time to market
- Largest user base and number of devices in the market
- Lightweight and “good enough” solutions, highly desirable for vertical markets
- Java development is easy to learn
- Multiple distribution channels, including ability to manage your own distribution

In addition, advantages of Java ME not explicitly addressed in the developer interviews include:

- Its Tools and Libraries are available for free
- It is open-source so the development community can influence the platform evolution
- It allows the applications to be written once and be supported on thousands of different feature phones, regardless of the handset manufacturer
- It is agnostic to the underlying mobile network technology: Apps run regardless of the underlying technology (CDMA, GSM, HSPA/HSPA+, LTE)
- It enables apps to store and process data locally, thus reducing traffic sent over the network and reducing the chances of any interruption or interception attacks
- It allows users to download apps onto feature phones over the air and in real-time

Conclusion

Success Story

Description: Mig33 is a mobile social network offering instant messaging, SMS text messages, games and public communities.

Installs: 40 million users in 200 countries, with over 20 million users in Indonesia

Why Java: Primarily runs on J2ME because of the deep penetration of Java ME phones in emerging markets. J2ME also enables direct access to native applications of the Java phones such as the phone book.

Business Model: Revenue from virtual goods, games and messaging.



As demonstrated in this white paper, the market for Java ME

applications is large and has a huge potential for growth. The opportunity in Asia for Java ME applications is particularly significant given the high penetration of Java ME enabled feature phones, the established distribution channels for Java ME applications, and the active ecosystem of operators, handset manufacturers, aggregators and third-party application stores – all of whom have a vested interest in the success of the Java ME platform.

Above all, now is the time to develop Java ME applications. The market is ripe for application development and an abundance of resources are available for Java ME developers.

In future publications, Oracle will detail the country-specific processes and steps required to effectively develop and distribute Java ME applications. However, with this whitepaper as an initial resource, Java ME developers can now further investigate the Asian market opportunity and more deeply explore the resources and tools that have been identified above.

Success Story

Description: Opera Mini is the world's most popular mobile web browser

Installs: 150 million+ of which 100 million in Southeast Asia

Why Java: Based on Java ME, Opera can stay true to its goal of providing a browser that operates across devices, platforms and operating systems.

Business Model: Revenue is generated from a search deal with Google and skinned version of their browser for operators.





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Hardware and Software, Engineered to Work Together