

The Series 40 Platform: Developer FAQ

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Series 40

NOKIA

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Change History

October 29, 2003	V1.0	Initial document release
June 28, 2004	V1.1	Updated information on tools and platform architecture
June 13, 2005	V2.0	Update with information on Series 40 Platform 3rd Edition

1 What is the Series 40 Platform?

1.1 What is the Series 40 Platform?

The Series 40 Platform delivers the biggest opportunity for developers and an advanced mobile experience for users. It includes a set of technologies designed to enable the building of devices that can run Java™ MIDP applications and offer rich media and content options.

In taking a platform approach, Nokia recognizes that developers need a consistent set of technologies to take advantage of the opportunities presented by the wireless marketplace. Series 40 Platform 3rd Edition represents Nokia's continued commitment to provide developers with uniform technologies across the widest possible range of Nokia terminals, which themselves provide a variety of capabilities, user interfaces, and form factors to optimally address the demands of all customers.

1.2 Which technologies does the Series 40 Platform contain?

The Series 40 Platform provides a common set of technologies and APIs for application development and digital content distribution. The platform includes a set of Java™ APIs, a browsing environment, Multimedia Messaging Service (MMS), Theme capability, and support for audio and video content, both downloadable and streaming.

1.3 Which devices incorporate the Series 40 Platform?

A wide range of devices incorporating the Series 40 Platform are available for all the major wireless standards, including GSM, CDMA, Enhanced Data Rates for Global Evolution (EDGE), and Wideband CDMA (WCDMA)/Universal Mobile Telecommunications System (UMTS). Information about devices available can be found on the Forum Nokia Web site by following the links from the Series 40 Platform section (www.forum.nokia.com/series40) or from the Device Specifications area (www.forum.nokia.com/devices).

1.4 Which user interfaces are implemented on devices incorporating the Series 40 Platform?

Devices based on the Series 40 Platform implement a common user interface style, which defines the behavior of UI components, ensuring a consistent user experience. At the same time, the screen resolution, orientation, and input methods can vary among certain Series 40 devices. While all devices utilize color screens, they may use two-, four-, or five-way navigation, and two or three softkeys or a rotor interface control. The most common screen resolution is 128 x 128 pixels, which is the resolution offered in the Nokia 6230 imaging phone. Other screen resolutions include 240 x 320 pixels (the Nokia 6265 phone), 208 x 208 pixels (the Nokia 8800 phone), 208 x 104 pixels (the Nokia 7280 phone), 128 x 160 pixels (the Nokia 6650 imaging phone), and 96 x 65 pixels (the Nokia 3510i mobile phone). Some Series 40 devices, such as the Nokia 6800 messaging device, add enhanced features such as a foldout full keyboard.

1.5 Which network standards does the Series 40 Platform support?

The Series 40 Platform is designed to be used in devices supporting many types of 2G, 2.5G, and 3G mobile phone networks, including:

- GSM and General Packet Radio Service (GPRS)
- CDMA
- Enhanced Data Rates for Global Evolution (EDGE)
- Universal Mobile Telecommunications System (UMTS)

In addition, Series 40 devices may offer local network connectivity options, including Bluetooth wireless technology, USB, and IrDA.

1.6 What kinds of end users does the Series 40 Platform target?

Nokia is committed to providing a diverse range of terminals to serve a full range of consumer tastes and applications. Some Series 40 devices, aimed at professional users, offer full keyboards and e-mail capabilities, while devices with a consumer orientation may offer features such as advanced digital music capabilities.

2 What is new about Series 40 Platform 3rd Edition?

2.1 What is new in Series 40 Platform 3rd Edition?

Series 40 Platform 3rd Edition builds on the capabilities provided in previous releases by providing:

- Java™ 2 Platform, Micro Edition (J2ME™) technology; Connected Limited Device Configuration (CLDC) 1.1; Mobile Information Device Profile (MIDP) 2.0; and Java™ APIs for Bluetooth (JSR-82), PDA Optional Packages for the J2ME™ Platform (JSR-75), including Personal Information Management (PIM) and FileConnection (FC), Mobile Media API (JSR-135), which adds camera and video support, and Mobile 3D Graphics API for J2ME™ (JSR-184). It is also compliant with Java™ Technology for the Wireless Industry (JSR-185)
- Browser support that is now compliant with Open Mobile Alliance (OMA) Browsing version 2.1 and that provides users with both WAP 2.0- and XHTML Mobile Profile (XHTML-MP)-based browsing using wireless profiled TCP/IP (wTCP/IP); ECMAScript support; and cookies support
- Multimedia Messaging Service (MMS) support compliant with OMA MMS version 1.2
- OMA Instant Messaging and Presence Service version 1.1
- Streaming audio in the Adaptive Multi-Rate Wideband (AMR-WB) and Advanced Audio Coding (AAC) formats
- Streaming video in H.263 format

2.2 How does Series 40 Platform 3rd Edition protect my investment in applications and services?

Series 40 Platform 3rd Edition is an evolutionary development of the Series 40 Platform. The technologies are generally backward-compatible with both Series 40 Platform 2nd Edition and Series 40 Platform 1st Edition standards as follows:

- *Java™ technology* — The Nokia UI APIs have been retained to allow existing Series 40 Platform 1st Edition MIDlets to function on Series 40 Platform 3rd Edition devices
- *Browsing* — The browser is dual-mode, supporting XHTML Mobile Profile (XHTML-MP) and WML 2.0, so existing WML content is viewable on Series 40 Platform 3rd Edition devices
- *Messaging* — Multimedia Messaging Service (MMS) content without Synchronized Multimedia Integration Language (SMIL) will be rendered as it was in Series 40 Platform 1st Edition
- *Audio and video content* — Standards from Series 40 Platform 2nd Edition and Series 40 Platform 1st Edition have been retained so existing content can still be viewed or heard
- *Themes* — New Themes content for Series 40 Platform 3rd Edition phones is ignored by earlier phones

2.3 Which devices use Series 40 Platform 3rd Edition?

The Nokia 6265 phone, operating on cdma2000® networks, and the Nokia 6280 phone, operating on GSM, Enhanced Data Rates for Global Evolution (EDGE), and High-Speed Circuit Switched Data (HSCSD) networks, are the first devices to use Series 40 Platform 3rd Edition. The list of Series 40 Platform devices is always growing. For the most recent listing, visit the Forum Nokia Web site's Series 40 Platform section (www.forum.nokia.com/series40) or Device Specifications area (www.forum.nokia.com/devices).

2.4 What is Nokia's roadmap for devices that support Series 40 Platform 3rd Edition?

Nokia will be progressively releasing new devices that support Series 40 Platform 3rd Edition, including those that support lead features beyond the core capabilities of the platform. For example, Nokia expects to include the Location API for J2ME™ (JSR-179) in devices with embedded Global Positioning System (GPS) receivers. It is expected that a large number of Series 40 Platform 2nd Edition and Series 40 Platform 1st Edition devices will remain in use for the next few years.

3 Which technologies does the Series 40 Platform contain?

3.1 Which development technologies are available?

Applications are developed using Java™ 2 Platform, Micro Edition (J2ME™) technology, Connected Limited Device Configuration (CLDC) 1.1, and Mobile Information Device Profile (MIDP) 2.0, while content can be developed for XHTML Mobile Profile (XHTML-MP) browsing as well as for Multimedia Messaging Service (MMS) messaging. Series 40 Platform 1st Edition supports MIDP 1.0 with the Nokia UI API extension and WML for browsing. Development tools work with integrated development environments (IDEs) from Borland Software Corporation, Sun Microsystems, Inc., and Nokia, and with the open source toolkit developed under the Open SSL Project.

Coding directly to the operating system is not supported.

3.2 How are applications and content downloaded to and installed on Series 40 Platform devices?

Applications and content can be downloaded over the air (OTA) and installed directly on a Series 40 Platform device. The ability to perform OTA application downloads depends on local operator support. Applications and content can also be downloaded from the Internet to a personal computer and installed on a Series 40 Platform device using the Nokia PC Suite via a USB serial cable or an IrDA connection.

3.3 Is support for WAP Push provided?

The Series 40 Platform includes support for the WAP Push Access Protocol (PAP), allowing developers to link messages and applications. This provides greater control of content delivery and handling, with capabilities such as application confirmation of messages and server querying for device capabilities.

3.4 What Digital Rights Management support does the Series 40 Platform provide?

Series 40 Platform supports Open Mobile Alliance (OMA) Digital Rights Management (DRM) version 1.0. The DRM standard is designed to allow content providers to define the usage rights for digital media objects and thereby control the consumption of media. OMA forward-lock, combined delivery, and separate delivery methods of content protection are supported.

3.5 What client provisioning does the Series 40 Platform support?

Series 40 Platform supports the Open Mobile Alliance (OMA) Client Provisioning standard. This is a mechanism that allows WAP, e-mail, Multimedia Messaging Service (MMS), and other clients to be configured with minimal user intervention. The standard also allows the configuration information to be delivered by a variety of mechanisms, including WAP Push over-the-air (OTA) provisioning and provisioning by means of other media, such as Subscriber Identity Module (SIM) cards.

3.6 Which synchronization technologies does the Series 40 Platform support?

Series 40 Platform 3rd Edition supports Open Mobile Alliance (OMA) Data Synchronization version 1.1.2, which provides a set of universal protocols for data synchronization. In addition, the ability to initiate synchronization over the air (OTA) from server-based alerts has been added.

3.7 Which audio and video standards does the Series 40 Platform support?

In addition to audio files in MIDI and True Tones formats, Series 40 Platform 3rd Edition adds support for streaming audio in the Adaptive Multi-Rate Wideband (AMR-WB) and Advanced Audio Coding (AAC) formats.

The Series 40 Platform supports video in H.263 and MPEG-4 formats. Series 40 Platform 3rd Edition adds support for streaming video in H.263 format.

3.8 Java™ Application Development

3.8.1 Which versions of Java™ MIDP and Java Specification Requests (JSRs) does the Series 40 Platform support?

Series 40 Platform 1st Edition supports Java™ 2 Platform, Micro Edition (J2ME™), Connected Limited Device Configuration (CLDC) 1.0, and Mobile Information Device Profile (MIDP) 1.0 technologies. In addition, the Nokia UI API, containing a set of UI enhancement APIs, gives developers additional capabilities in the areas of graphics, full-screen drawing, access to softkeys, and sound and vibration features. Some compliant Series 40 devices also support the Wireless Messaging API (JSR-120).

Series 40 Platform 2nd Edition is compliant with Java™ Technology for the Wireless Industry (JSR-185) and supports CLDC 1.1 and MIDP 2.0. To ensure backward compatibility, Nokia also provides the Nokia UI API extension, though the capabilities that these APIs support are now part of MIDP 2.0.

Series 40 Platform 2nd Edition supports three additional standard API sets:

- Java™ APIs for Bluetooth (JSR-82) allows applications to exploit Bluetooth connectivity. It should be noted that the implementation does not support OBEX
- JSR-120 gives application developers device-independent access to Short Message Service (SMS)
- Mobile Media API (JSR-135) provides developers with APIs to access MIDI and tone sound for playback on Series 40 devices

Series 40 Platform 3rd Edition retains JSR-185 compliance and builds on the CLDC 1.1 and MIDP 2.0 support with:

- Java™ APIs for Bluetooth (JSR-82)
- Wireless Messaging API (JSR-120)
- Mobile Media API (JSR-135) provides developers with APIs to access MIDI and tone sound for playback on Series 40 devices

- PDA Optional Packages for the J2ME™ Platform (JSR-75), including both Personal Information Management (PIM) and FileConnection (FC), which allows applications to access calendar, contact, and to-do records as well as to access the file system to perform tasks such as saving e-mail attachments in a Java e-mail application
- Mobile 3D Graphics API (JSR-184), which provides features to create rich 3D graphics for games, animated messages, screen savers, custom user interfaces, or interactive product visualization

3.8.2 Does Nokia plan to support any additional Java Specification Request (JSR) specifications in the Series 40 Platform?

The following JSRs will be available on some Series 40 Platform 3rd Edition devices:

- Mobile Media API (JSR-135), adds support for both still and video camera features
- Scalable 2D Vector Graphics API for J2ME™ (JSR-226)
- Java™ APIs for Bluetooth (JSR-82), adding Bluetooth Push Registry
- Location API for J2ME™ (JSR-179)

Nokia has a policy of continuous product development. It is possible that future Series 40 Platform devices will incorporate additional APIs, either as fully compliant JSR implementations or based on draft JSR recommendations.

3.9 Content Development

3.9.1 Which browsing standards does the Series 40 Platform support?

Series 40 Platform 1st Edition supports WML browsing over WAP. Some Series 40 devices also support XHTML Mobile Profile (XHTML-MP) browsing over WAP or wireless profiled TCP/IP (wTCP/IP).

Series 40 Platform 2nd Edition supports XHTML-MP and WML browsing over wTCP/IP in a dual-mode browser.

Series 40 Platform 3rd Edition supports Open Mobile Alliance (OMA) Browsing version 2.1 with both WML 2.0- and XHTML-based browsing over wTCP/IP in a dual-mode browser.

3.9.2 Which messaging standards does the Series 40 Platform support?

Series 40 Platform 1st Edition supports Multimedia Messaging Service (MMS), Smart Messaging, and Short Message Service (SMS). Some Series 40 devices may also have e-mail capabilities as a technology extension of the platform.

Series 40 Platform 2nd Edition adds support for Synchronized Multimedia Integration Language (SMIL) 2.0 Basic Language Profile in MMS. SMIL is a markup feature that defines the layout, order, and display timing of the multimedia elements in an MMS message, allowing messages to be played as a slide show.

Series 40 Platform 3rd Edition messaging complies with Open Mobile Alliance (OMA) MMS version 1.2. True interoperability is now provided among the content classes: image basic, image rich, video basic, and video rich. Synthetic audio and video can now be included in messages, and the maximum supported message size has been increased to 300 KB.

3.10 What other types of content can be developed for Series 40 Platform devices?

Other content possibilities include MIDI ring tones, True Tones, streaming and static audio, streaming and static video, and Themes.

4 How do I develop for the Series 40 Platform?

4.1 What Java™ development tools are available for the Series 40 Platform?

Developer tools for Series 40 Platform include the Series 40 Platform SDKs, which are available in the Tools & SDKs section of the Forum Nokia Web site (www.forum.nokia.com/tools).

The SDKs includes a device emulator, Java class libraries, APIs (including the Nokia UI API), and documentation. The SDKs are compatible with professional Java development environments (IDEs) from Sun Microsystems, Inc., IBM Corporation, and Borland Software Corporation. For more details, see the Tools & SDKs section of the Forum Nokia Web site (www.forum.nokia.com/tools).

The Nokia Developer's Suite for Java™ 2 Platform, Micro Edition (J2ME™) can be used in conjunction with IDEs from Borland, IBM, or Sun or with the open source NetBeans or Eclipse IDE. This tool accepts SDK plug-ins for each of the supported devices and SDKs.

SDKs supporting Series 40 Platform 3rd Edition will be available soon commencing with the Prototype SDK.

4.2 What tools are available for content developers?

The Nokia Mobile Internet Toolkit (NMIT) provides the tools that developers need to create and test browsing and messaging applications. The toolkit can be used in conjunction with the Series 40 Platform SDKs but also contains a reference implementation browser; for more details, see the Tools & SDKs page of the Forum Nokia Web site (www.forum.nokia.com/tools).

Developers of messaging applications will benefit from the Nokia Developer's Suite for MMS, while those working with XHTML Mobile Profile (XHTML-MP) or WML and Push applications should get NMIT. Another resource is the Nokia Mobile Server Services API and Library for developers working with Nokia Multimedia Messaging Service Center (MMSC) and server deployment projects. All of these tools are available free of charge from the Tools & SDKs section of the Forum Nokia Web site (www.forum.nokia.com/tools).

4.3 What tools are available for other content development?

For multimedia projects, there is the Nokia Audio Suite, a set of tools for creating SP-MIDI polyphonic ring tones.

Developers who want to generate Open Mobile Alliance (OMA) Digital Rights Management (DRM) and over-the-air (OTA) download files will need to use Nokia Mobile Internet Toolkit (NMIT) 4.1 or later.

Themes developers will use the Series 40 Theme Studio to create fully integrated Themes packages.

4.4 Are all of Nokia's tools available to all developers?

Nokia offers developers the opportunity to join Forum Nokia PRO. One of the benefits of the Forum Nokia PRO program is that members get early access to new and updated tools. Once the early-access period on Forum Nokia PRO has expired, each tool is made available in the Tools & SDKs section of the Forum Nokia Web site (www.forum.nokia.com/tools).

5 Can I write applications and content that will run on different versions of the platform or on other manufacturers' phones?

5.1 How will Java™ applications run on the Series 40 Platform?

5.1.1 Will a Java™ application run unchanged on all devices incorporating the Series 40 Platform?

There are two main criteria that affect whether an application for one Series 40 Platform device will run on another: screen resolution and Java API usage.

An application that uses Mobile Information Device Profile (MIDP) 1.0 and Nokia UI APIs should work on any Series 40 Platform device that has the same screen resolution as that of the original target device.

Applications may require modifications to run usefully on Series 40 devices with screen resolutions that differ from the original target device's resolution. In addition, if an application makes use of any of the technology extensions provided in a particular Series 40 Platform edition or device, its compatibility will be limited to devices of the same edition or with the same technology extensions. Specific Series 40 devices may have unique capabilities, features, or issues. The best way to maximize development investment is to design initially for the Series 40 Platform, and then optimize the design for specific devices.

Some incompatibilities may exist between two Series 40 devices that have the same screen resolution. When incompatibilities are discovered, Nokia will take steps to resolve the issues and will communicate the issues to the developer community in the documents *Series 40 and Series 60 Developer Platform 1.0: Known Issues* and *Developer Platform 2.0: Known Issues*, which are available in the Documents section of the Forum Nokia Web site (www.forum.nokia.com/documents).

5.1.2 Will a Java™ application written for Series 40 Platform 3rd Edition run unchanged on devices that use an earlier edition?

Developers will need to consider, at an early stage of development, whether they want an application to be compatible across all devices that incorporate the Series 40 Platform. By avoiding specific Java Specification Requests (JSRs) and using the APIs provided in the Nokia UI extension rather than those from Mobile Information Device Profile (MIDP) 2.0, developers can create applications for devices incorporating any version of the Series 40 Platform.

5.1.3 Will a Mobile Information Device Profile (MIDP) application written for the Series 40 Platform also run on devices incorporating the Series 60 Platform or the Series 80 Platform or on the Nokia 7710 widescreen smartphone?

Applications using MIDP high-level UI components should run properly on all platforms, so adapting a Series 40 Platform 2nd Edition MIDP application to run on Series 60 Platform 2nd Edition devices should require little more than adapting the UI to the different screen size and key-input arrangement. Migrating to Series 80 Platform 2nd Edition devices or the Nokia 7710 widescreen smartphone will require some additional work, because the screens of those devices are much larger and use landscape mode. In the case of the Nokia 7710 widescreen smartphone, a pen-based UI is involved.

Given that both Series 60 Platform 1st Edition and Series 40 Platform 1st Edition support MIDP 1.0 with the Nokia UI API extension, applications developed for later editions of the Series 40 Platform will require similar optimization to run on either of these platforms.

However, Java™ applications written for the Series 60 Platform, the Series 80 Platform, or the Nokia 7710 widescreen smartphone may not be adaptable to Series 40 Platform devices, particularly if they

take advantage of the additional memory or larger screen size employed on Series 60 devices, Series 80 devices, or the Nokia 7710 smartphone. Developers who want to target the widest range of devices should always begin development with the most constrained device they plan to support. In addition, developers should test applications in as many emulators and devices as possible to ensure the applications work as expected.

5.1.4 Will applications written for the Series 40 Platform run on other manufacturers' Java™ phones?

Applications developed using the core Mobile Information Device Profile (MIDP) 2.0 specification should run on other manufacturers' MIDP 2.0-compliant devices. The same considerations for creating applications that can be used across devices incorporating the Series 40 Platform apply with regard to screen size and Java Specification Request (JSR) extensions. The use of legacy Nokia UI APIs would preclude applications from running unchanged on other manufacturers' phones.

5.2 Content Development

5.2.1 How will browser applications be affected by Series 40 Platform 3rd Edition?

Series 40 Platform 3rd Edition extends the browser support with full compliance with Open Mobile Alliance (OMA) Browsing version 2.1. This means developers have two choices when implementing browsing applications. To address all Series 40 Platform devices, developers should create content in WML. If content is required to be accessible only from Series 40 2nd Edition or Series 40 3rd Edition devices, then it can be created using XHTML Mobile Profile (XHTML-MP).

5.2.2 Are Multimedia Messaging Service (MMS) content and applications usable on all Series 40 Platform devices?

The Series 40 Platform supports MMS as follows:

- 1st Edition supports MMS but does not support Synchronized Multimedia Integration Language (SMIL).
- 2nd Edition supports MMS with SMIL.
- 3rd Edition supports Open Mobile Alliance (OMA) MMS version 1.2. This provides true interoperability between the content classes: image basic, image rich, video basic, and video rich. Synthetic audio and video can now be included in messages, and the maximum supported message size has been increased to 300 KB.

Therefore, developers need to consider issues such as content type and size when determining which devices their MMS content and applications will work on. In addition, messages designed to work on Series 40 1st Edition need to be created with the components arranged in the required order of presentation to compensate for the lack of SMIL.

To ensure an optimal user experience, developers will also need to consider the screen sizes employed on various Series 40 devices when developing MMS content.

MMS content should work with other manufacturers' MMS phones.

5.2.3 Will other content be usable on all versions of the Series 40 Platform?

Where a device incorporating the platform supports a specific file format, content should be usable without alteration. Yet developers may want to address issues such as screen size and available memory to ensure the user receives the best performance possible. Some operators use tools to perform content optimization for media components, such as audio or images, included in a

Multimedia Messaging Service (MMS) message. Developers should consult with service providers to determine whether such features are available on targeted networks.

6 Known Issues

6.1 How similar will the implementation of core technology be across all the Nokia platforms?

Nokia is committed to maintaining compatibility among the various platforms wherever possible. Where compatibility is not possible, Nokia intends to document the minor differences in API implementations.

6.2 How do I find out about known issues?

Where issues are identified, information will be made available through the Forum Nokia Web site (www.forum.nokia.com).

Such information is included in the following documents, which are available in the Documents section of the Forum Nokia Web site (www.forum.nokia.com/documents):

- *Series 40 and Series 60 Developer Platform 1.0: Known Issues*
- *Developer Platform 2.0: Known Issues*

7 What is the business case for developing for the Series 40 Platform?

7.1 What is the business case for creating mobile applications and content for the Series 40 Platform?

Of the more than 180 million Nokia platform devices shipped by December 2004, the majority were devices based on the Series 40 Platform. This offers developers access to markets for content and applications in which the number of potential customers can be measured in the tens of millions.

The users of Series 40 Platform devices are significant consumers of applications and content. Typical examples follow:

- Kiloo ApS, a Danish company founded in 2000, has been creating Java™ games since 2001. Today it focuses on Java™ 2 Platform, Micro Edition (J2ME™) development and sells its applications with 40 operators around the world. Since its first sale, Kiloo's games have been downloaded more than 1 million times, and current download rates are 100,000 per month. Some 60 percent of those downloads have been games for Nokia devices.
- HandyGames, the developer of Townsmen, launched Townsmen 2 in November of 2004. Within three months, more than 150,000 copies of the new title had been downloaded, of which 40 percent were for Series 40 Platform devices.

In addition, the platform approach offers significant advantages in enabling applications and content for a range of devices based on the Series 40 Platform. For example, Kiloo has found that migrating applications from one Nokia platform and related device to another can be achievable in less than half the time needed for competing platforms. The common technology base of the Series 40 Platform, the Series 60 Platform, and the Series 80 Platform means applications and content can easily be migrated. This ease of migration allows developers to multiply the potential market for their applications or content with only small incremental investments in optimizing or migrating those offerings.

More than 90 Nokia platform devices have been shipped, most of them based on the Series 40 Platform. Within that broad range are devices optimized for music consumption; devices with full keyboards to facilitate messaging; and those with features such as flashlights and thermometers.

There are also imaging phones as well as many devices that provide more-traditional mobile phone features. This model differentiation also offers developers the opportunity to create content and applications for specific user groups while retaining mass-market volumes.

The business case for developing for the Series 40 Platform is the volume that can be attained. The case is reinforced by the platform approach, which means that, despite the varied range of devices, Java™ applications, Web content, Multimedia Messaging Service (MMS), Themes, audio, and video content can be created for use across this entire family with minimal optimization effort. The Series 40 Platform also provides developers with a springboard for leveraging content, from a volume base, onto Nokia's other platforms.

7.2 What marketing tools are available from Nokia?

Nokia connects mobile application developers to the market in multiple ways.

Preminet Solution is a hosted content distribution tool that connects mobile content providers, retailers, and consumers. Preminet is open and customizable and brings global sales opportunities to content providers. Preminet makes it easy to deliver quality content and applications into the hands of mobile consumers around the world.

Nokia also offers developers lucrative opportunities to sell mobile content and Java Verified™ applications through Nokia sales channels: Nokia Software Market and Nokia MultiMediaCards (MMCs). In addition, some applications may be chosen to be embedded in new Nokia devices.

For full details, please follow the Marketplace link in the Developers section of the Nokia Web site (www.nokia.com/developers).

Forum Nokia PRO, which now has more than 400 member companies, provides exclusive access to business opportunities through industry and customer events, customer matchmaking, marketing catalogs, and several other programs. For full details, please visit the Forum Nokia PRO section of the Forum Nokia Web site (www.forum.nokia.com/pro).