

J2ME-Related JSRs and their Influence in Future Mobile Applications

Siemens **m**obile
Software Development Tools

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Siemens mobile and J2ME (1/2)

- Siemens has provided proprietary API extensions last year because of a lack of functionality in MIDP and on request of application developers and operators, namely for gaming and telephony



Java™ on Siemens Mobile Phones

MIDP

Siemens Ext.

Java CLDC/ KVM

Game
API

Mobile Phone SW

Siemens and
J2ME

Java
Community
Process

The Future of
J2ME

Wireless
Messaging API

Payment

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Architectures

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Q & A

Siemens mobile and J2ME (2/2)

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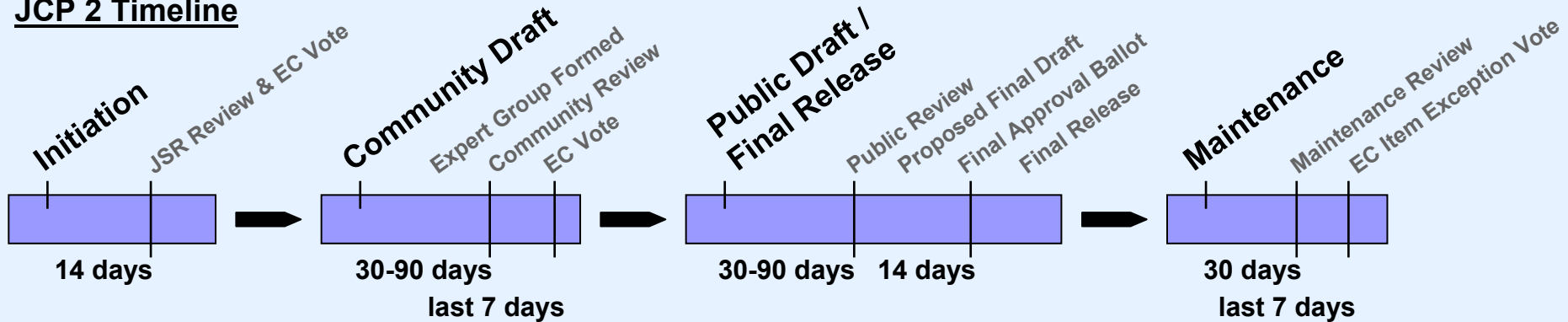
Q & A

- **Siemens will NOT drive new proprietary API extensions, because interoperability is a must in the GSM world (Imagine a world where every handset manufacturer and every network operator requests different API's , the interoperability would be zero)**
- **Hardware support for Java in the handsets will lead to a massive performance improvement of Java and lower power consumption at the same time. E.g. Jazelle from Arm could increase the performance up to 10 times and save power at the same time compared to a classical CPU / soft VM design.**
- **MIDP 1.0 will be a standard feature in the mass market in Europe**
- **Siemens is participating in the Java Community Process to drive standards:**

Java Community Process and Java Standardization Requests

- The Java Community Process (JCP) is an open organization of Java developers and licensees whose charter is to develop and revise Java technology specifications.

JCP 2 Timeline



- **Categories of Java Standardization Requests (JSRs) in J2ME:**
 - Configuration: Providing VM and core library. Designed by avail. resources, such as memory, user interface, network capability, etc. e.g. CLDC
 - Profile: Providing APIs sitting on a configuration. Designed by target market or device type. e.g. MIDP
 - Optional Package: Additional, not mandatory, package for configuration or/and profile. "Configuration + Profile = Great Common Measure"

The Future of J2ME (1/3)

- **CLDC 1.1 NG (Next Generation), JSR 139**
 - Extended CLDC functionality with floating point and exception handling
- **MIDP 2.0 NG (Next Generation), JSR 118**
 - Enhanced MIDP with new core functions like Domain security model, HTTPS, OTA Download, billing, provisioning, games, sound, LCDUI enhancements
- **PDA Profile for the J2ME™ Platform, JSR 75**
 - Define a profile with standard APIs (PIM) for PDA like devices
- **Java APIs for Bluetooth, JSR 82**
 - Basic support to Bluetooth protocols: RFCOMM, OBEX and Service Discovery protocol
- **Wireless Messaging API, JSR 120**
 - Optional APIs for messaging like SMS, USSD, CBS

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The Future of J2ME (2/3)

- **Multimedia API for J2ME, JSR 135**
 - High level interface to sound and multimedia
- **Web Services API for J2ME, JSR 172**
 - Provide standard access from J2ME to web services
- **Security and Trust Service API for J2ME, JSR 177**
 - Provide J2ME applications with APIs for security and trust services through the integration of a Security Element.
- **Location API for J2ME, JSR 179**
 - Provide a compact and generic API that produces information about the device's present physical location to Java applications
- **Session Initiation Protocol (SIP) API for J2ME, JSR 180**
 - Defines a multipurpose SIP API for J2ME clients. Enables SIP applications to be executed in memory limited terminals.

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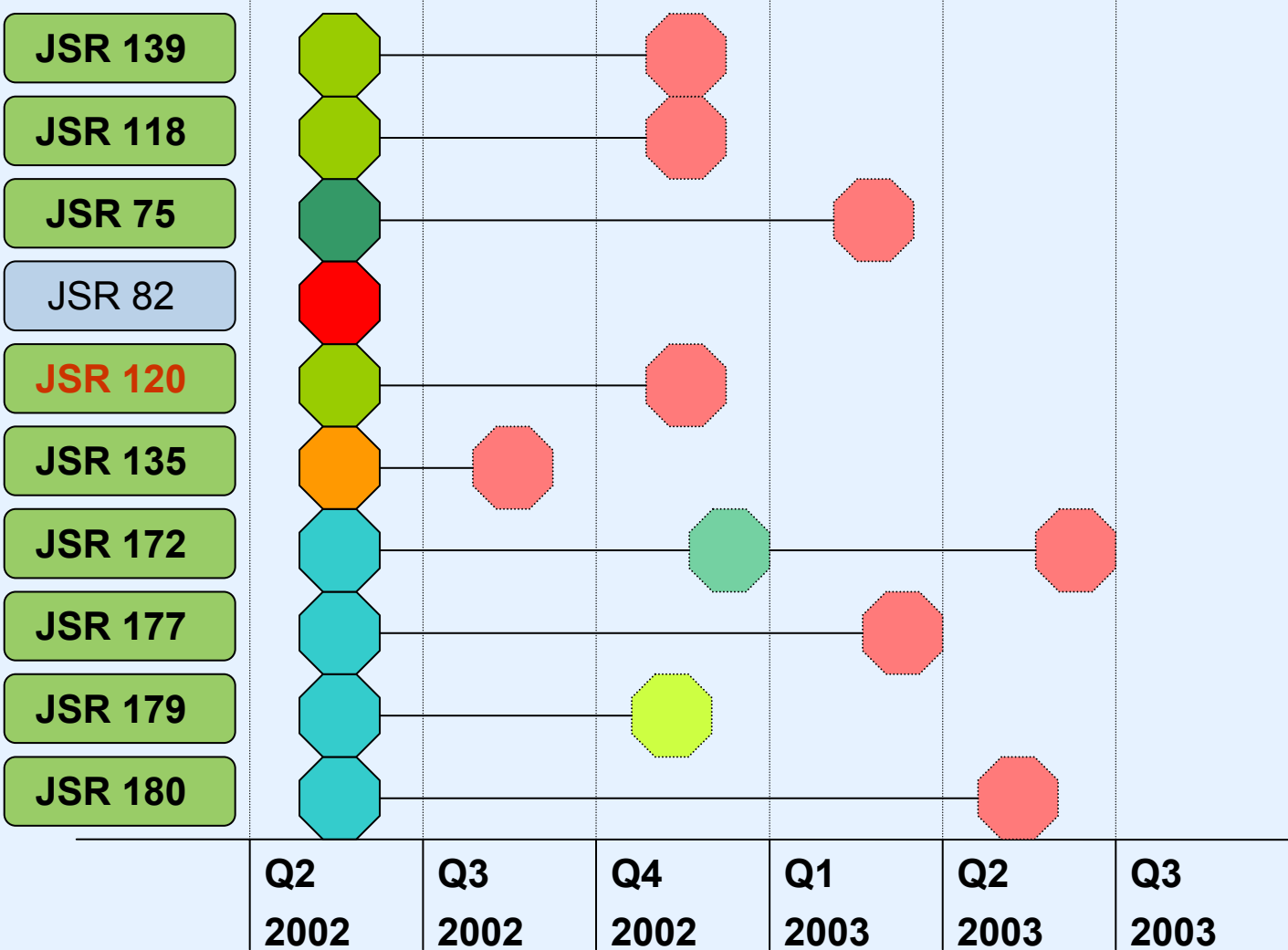
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The Future of J2ME (3/3)



JSR "Roadmap"

- Legend:**
- Already Avail.
 - Proposed Final Draft
 - Public Review
 - Community Review
 - EG Formation

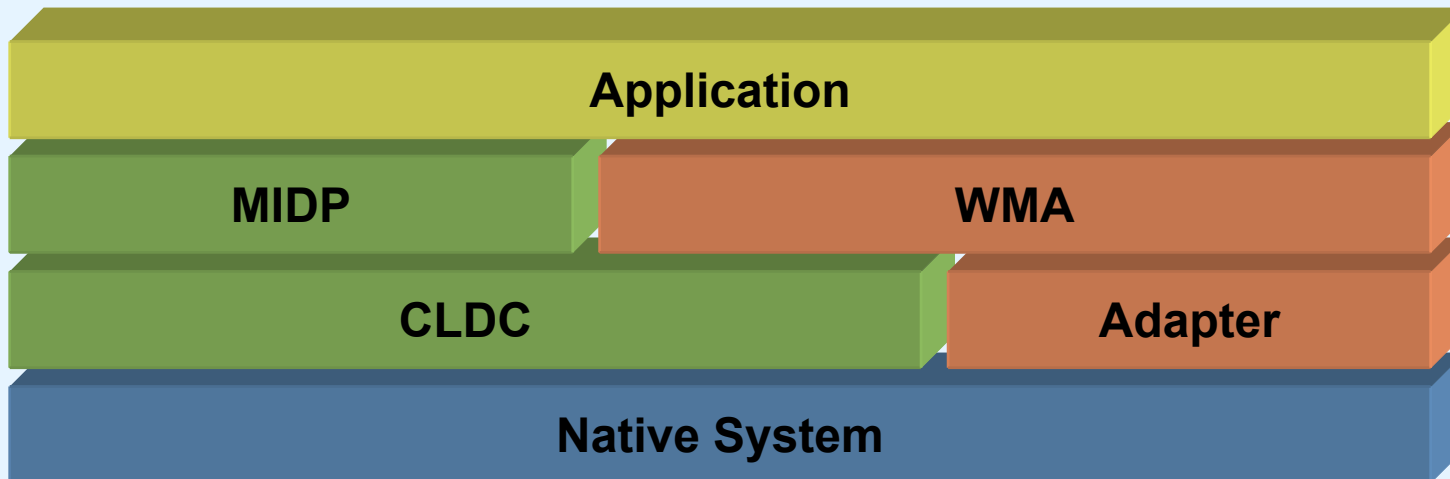
Wireless Messaging API (JSR 120)

Goals:

- Interoperability between different manufacturers
- Interoperability between networks
- Small footprint
- Expandable to new network and message formats

Architecture:

- Using the Generic Connection Framework of the CLDC
- Java API, which is network independent
- Adapter's for GSM and CDMA
- Use port numbers to enable application to application communication



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WMA Security

For MIDP 1.0:

- No formal mechanism defined
- User has to grant if an operation is allowed or not

For MIDP 2.0 (NG)

- **Permissions for Connector.open**
 - Javax.microedition.io.Connector.sms
 - Javax.microedition.io.Connector.cbs
- **Permissions for send and receive**
 - Javax.wireless.messaging.sms.send
 - Javax.wireless.messaging.sms.receive

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Message based Communication

Message based Applications

- Chat
- Games: Battleship, Chess, Contests
- News and Information
- Customized SMS Client

Message Types: text, binary

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Example: Sending a Text Message

```
try
{
    String addr="sms://+49123456789";
    MessageConnection conn = (MessageConnection) Connector.open(addr);
    TextMessage msg =
        (TextMessage) conn.newMessage(MessageConnection.TEXT_MESSAGE);
    msg.setPayloadText("Hello, World!");
    conn.send(msg);
} catch (Exception e) {
...
}
```

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Example: Receiving a Message

```
try {
    String addr = "sms:///5432";
    MessageConnection conn = (MessageConnection) Connector.open(addr);
    Message msg = null;
    while (someExitCondition) {                                // wait for incoming messages
        msg = conn.receive();                                  // received a message
        if (msg instanceof TextMessage) {
            TextMessage tmsg = (TextMessage)msg;
            String receivedText = tmsg.getPayloadText();
            system.out.println (receivedText);                // just show it somewhere
        } else {                                             // Received message was not
            ...                                               // a text message, but e.g.
        }                                                    // binary
    }
} catch (Exception e) {
    ...
}
```

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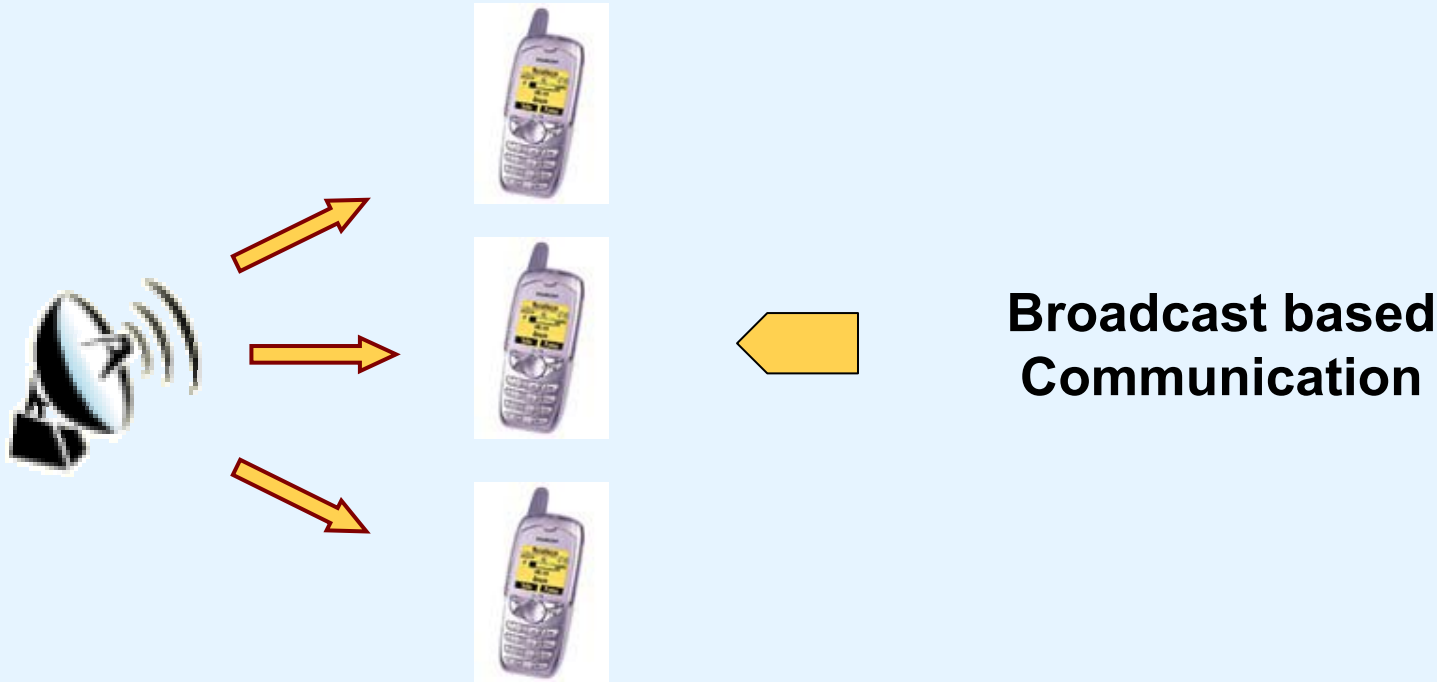
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Broadcast based Applications



- Location based services
- Restaurant finder
- Car parking information
- News and entertainment
- Local weather information

Broadcast based Communication

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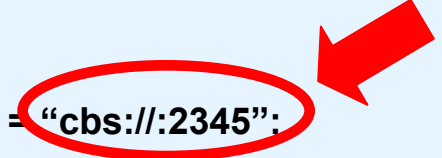
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Example: Receiving a Broadcast

```
try {
  String addr = "cbs://:2345";
  MessageConnection conn = (MessageConnection) Connector.open(addr);
  Message msg = null;
  while (someExitCondition) {
    msg = conn.receive();
    if (msg instanceof TextMessage) {
      TextMessage tmsg = (TextMessage)msg;
      String receivedText = tmsg.getPayloadText();
      system.out.println (receivedText);
    } else {
      ...
    }
  }
} catch (Exception e) {
  ...
}
```



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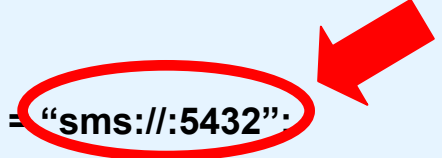
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Example: Receiving a Message

```
try {
    String addr = "sms://:5432";
    MessageConnection conn = (MessageConnection) Connector.open(addr);
    Message msg = null;
    while (someExitCondition) {
        msg = conn.receive();
        if (msg instanceof TextMessage) {
            TextMessage tmsg = (TextMessage)msg;
            String receivedText = tmsg.getPayloadText();
            system.out.println (receivedText);
        } else {
            ...
        }
    }
} catch (Exception e) {
    ...
}
```



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Wireless Messaging API Summary

- **Standard API for message communication**
- **Standard API for receiving broadcast information**
- **Interoperability between different networks**
- **Network independent Java interface**

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Payment Concept

Preinstalled basic applications at the phone as teaser for downloadable applications with payment function

- **Different kinds of payment rules are possible**
 - pay per interaction
 - pay per activated, next level
 - pay per ordered activated feature
 - pay per usage
 - pay per download
 - pay per ordered and received data
 - pay per upload of data
 - pay after teaser
- **Two different standard payment methods are useful**
 - payment via premium priced SMS
 - One-time pre-payment before download

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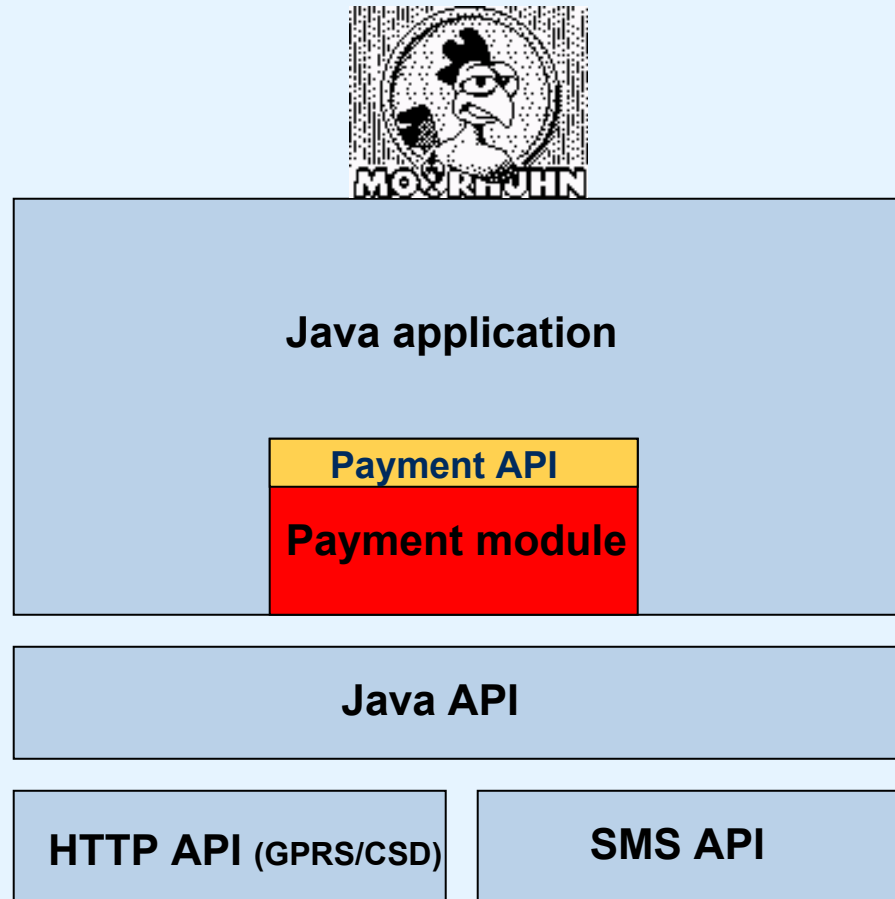
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Structure of Payment Enabled Java Applications



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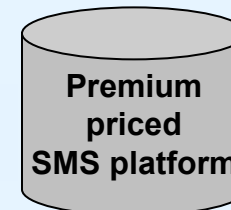
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Payment Example in a Power Game



The application sends a premium priced SMS to the predefined SMS short code in the background (invisible for the user). The short code is given in the payment module and depends of the defined price group. After successful send out of the premium priced SMS the next level will be started.



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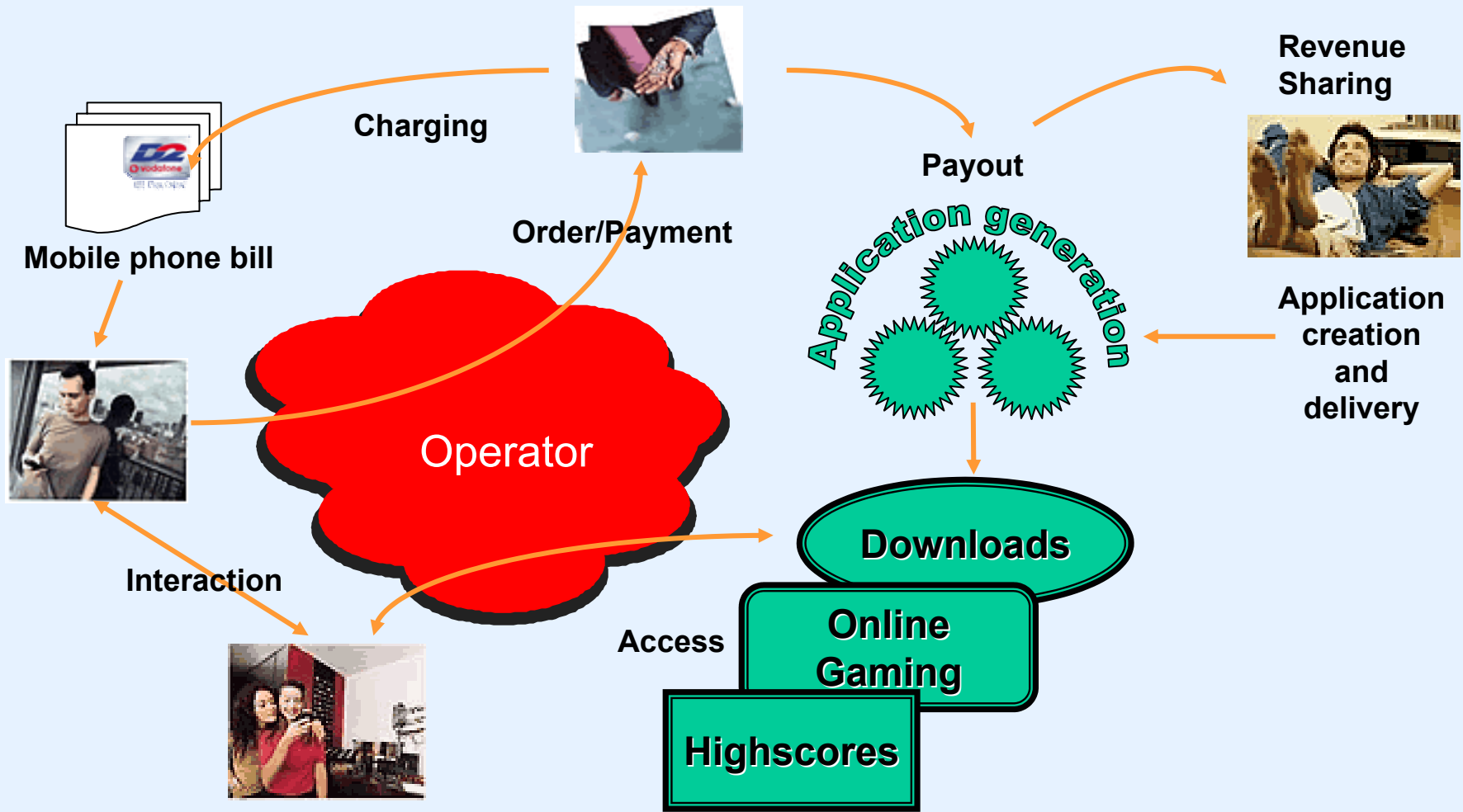
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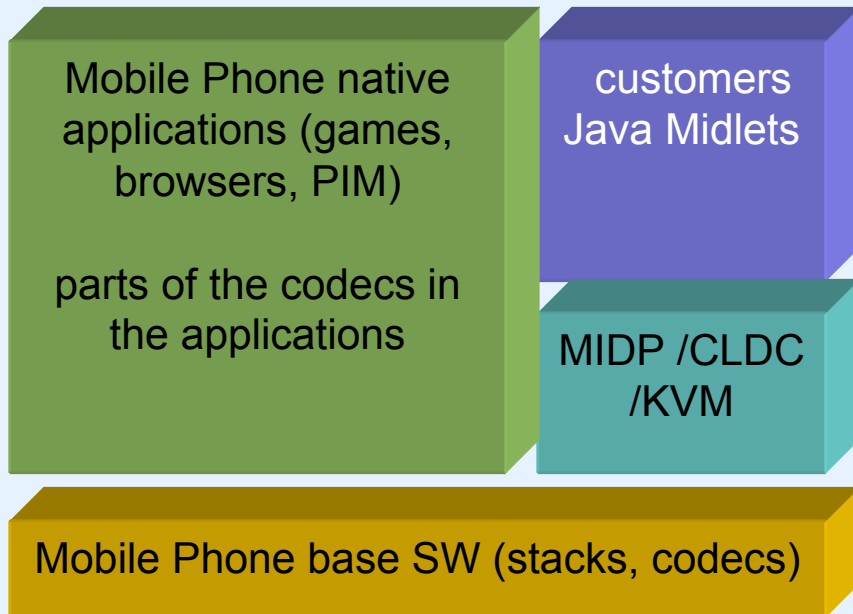
Payment Principles and Infrastructure



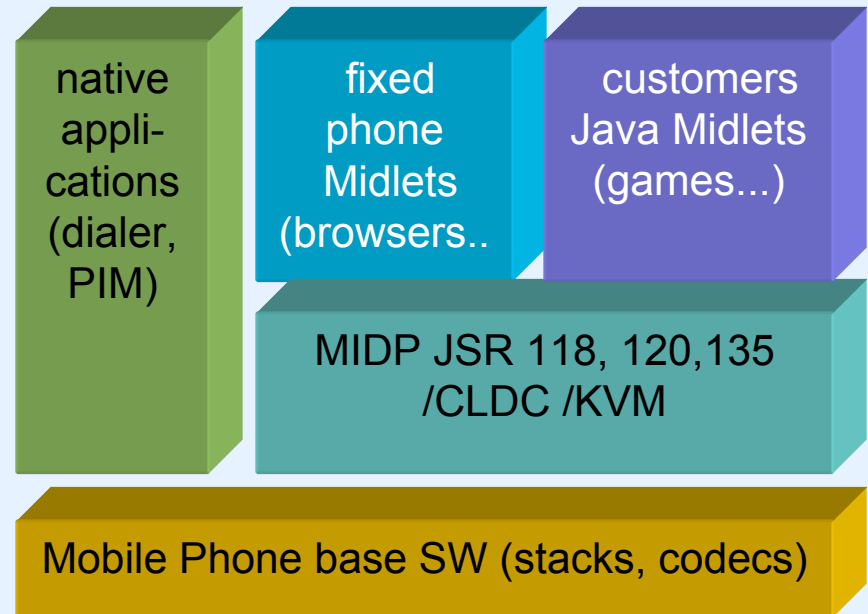
Future Phone Software Architecture (1/2)

- Many native phone applications will be replaced by Java applications (but the end customer will see no difference, e.g. games).
- This will speed up the development of new low and mid end phone models

Today



Tomorrow:

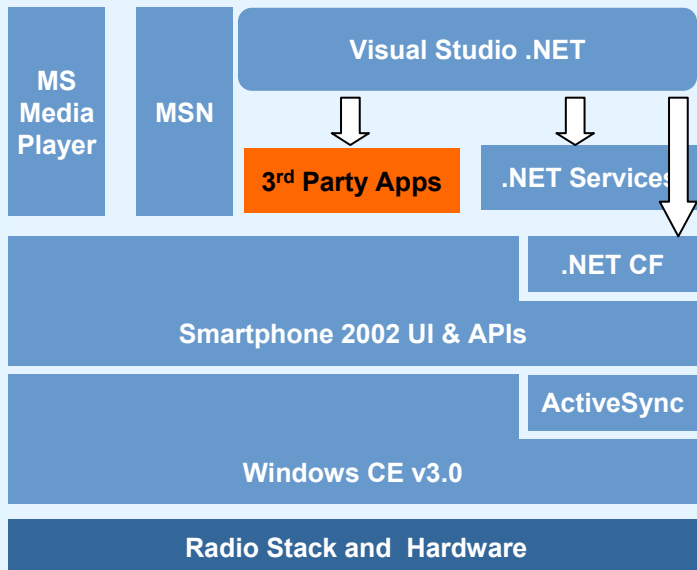


Future Phone Software Architecture (2/2)

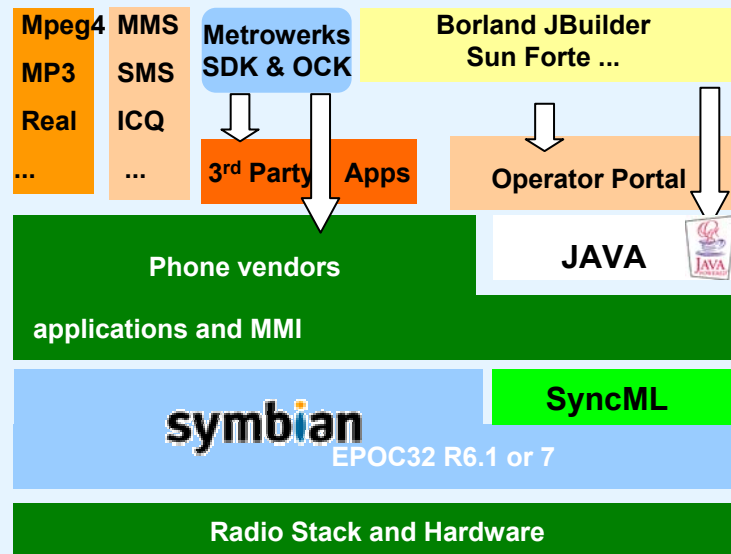
- diversity ⇔ no diversity ?
- high competition ⇔ low competition ?
- one price ⇔ price competition ?
- Fragmentation ⇔ consistency ?

Microsoft Smartphone

Blue = Microsoft level of control



Symbian Smartphone



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