### Chapter 5: Taking Apps to Market and Wireless Languages

**1. Taking Apps to Market**

**1.1 Versioning of Mobile Apps**

* **Definition**: Versioning is the process of assigning unique version numbers to mobile apps to track updates, bug fixes, and new features.
* **Types of Versioning**:
  1. **Major Version** (X.0.0): Significant changes, redesigns, or new features.
  2. **Minor Version** (X.Y.0): Adds smaller features, improvements.
  3. **Patch/Fix Version** (X.Y.Z): Bug fixes or minor security patches.

🔹 **Example**:

* WhatsApp v2.21.1.13 →
  + 2 = Major
  + 21 = Minor
  + 1.13 = Patch

**Importance**:

* Helps users know when an update is significant.
* Required by app marketplaces (Google Play, App Store) for submission.
* Ensures backward compatibility and maintenance.

**1.2 Signing Mobile Apps**

* **Definition**: Signing is the process of attaching a **digital certificate** to an app before distribution to verify its authenticity and integrity.
* **Purpose**:
  + Confirms the app is from a trusted developer.
  + Prevents tampering or modification by attackers.
  + Ensures secure installation on devices.
* **Example**:
  + Android apps are signed using **APK Signing Key**.
  + iOS apps require **Apple Developer Certificate**.

🔹 **Without signing,** app stores will reject the app and users cannot install it.

**1.3 Packaging Mobile Apps**

* **Definition**: Packaging refers to **bundling code, resources, and metadata** into a distributable format for mobile platforms.
* **Formats**:
  + **Android** → APK (Android Package Kit) / AAB (Android App Bundle).
  + **iOS** → IPA (iOS App Archive).
* **Contents of Package**:
  + Compiled code (DEX for Android, LLVM for iOS).
  + App resources (images, layouts, strings).
  + Manifest file (permissions, app info).
  + Signature & certificate.

🔹 **Example**:

* An Android APK contains AndroidManifest.xml, classes.dex, res/, META-INF/ (signatures).

**1.4 Distributing Apps on Mobile Marketplaces**

* **Steps for Distribution**:
  1. **Register as Developer**
     + Google Play Developer Console ($25 one-time fee).
     + Apple Developer Program ($99/year).
  2. **Prepare the App Package** (signed APK/AAB or IPA).
  3. **Upload to Store** with:
     + App name, description, screenshots, icons.
     + Content rating, privacy policy.
  4. **Review Process** (automated + manual review for policy compliance).
  5. **Publishing** – App becomes available for users to download.
* **Alternative Distribution**:
  1. Sideloading (direct installation from file).
  2. Enterprise distribution (for internal company apps).

🔹 **Example**:

* A banking app is uploaded to the Play Store after versioning, signing, and packaging.
* Updates follow the same cycle with a new version number.

**2. Wireless Languages**

Wireless languages are **markup languages** designed for mobile and wireless devices with limited screen size, bandwidth, and processing power.

**2.1 HDML (Handheld Device Markup Language)**

* **Early markup language** for mobile phones (before WML).
* Developed by Openwave.
* Designed for very small screens and limited devices.
* Similar to HTML but lightweight.

🔹 **Example**:

<HDML VERSION=3.0>

<DISPLAY>

<ACTION TYPE=ACCEPT LABEL="OK">

Welcome to HDML page!

</DISPLAY>

**2.2 WML (Wireless Markup Language)**

* Based on XML, designed for **WAP (Wireless Application Protocol)**.
* Used in early mobile browsers.
* Organized in **cards** inside a **deck**.

🔹 **Example**:

<?xml version="1.0"?>

<!DOCTYPE wml PUBLIC "-//WAPFORUM//DTD WML 1.1//EN">

<wml>

<card id="welcome" title="Hello">

<p>Welcome to WML Page!</p>

</card>

</wml>

**2.3 HTML (HyperText Markup Language)**

* Standard language for web pages.
* Widely supported on modern smartphones with full browsers.
* Allows multimedia, CSS, JavaScript.

🔹 **Example**:

<!DOCTYPE html>

<html>

<head><title>Mobile Page</title></head>

<body>

<h1>Hello Mobile!</h1>

<p>This is an HTML page for mobile devices.</p>

</body>

</html>

**2.4 cHTML (Compact HTML)**

* Subset of HTML for **Japanese i-mode phones**.
* Lightweight version without advanced tags like <frameset>.
* Supports basic text, links, and forms.

🔹 **Example**:

<html>

<head><title>cHTML Example</title></head>

<body>

<h1>i-mode Page</h1>

<a href="next.html">Next Page</a>

</body>

</html>

**2.5 XHTML (Extensible Hypertext Markup Language)**

* Reformulation of HTML using **XML rules**.
* Stricter syntax than HTML (e.g., tags must be closed).
* Mobile variant: **XHTML Mobile Profile (XHTML-MP)**.

🔹 **Example**:

<?xml version="1.0" encoding="UTF-8"?>

<html xmlns="http://www.w3.org/1999/xhtml">

<head><title>XHTML Example</title></head>

<body>

<h1>Welcome</h1>

<p>This is XHTML page for mobile devices.</p>

</body>

</html>

**2.6 VoiceXML (Voice Extensible Markup Language)**

* XML-based language for **voice-enabled applications**.
* Used in IVR (Interactive Voice Response) systems.
* Supports speech recognition and text-to-speech.

🔹 **Example**:

<vxml version="2.1">

<form>

<field name="name">

<prompt>What is your name?</prompt>

</field>

</form>

</vxml>

**3. Summary Table**

| **Language** | **Use Case** | **Example Device/Platform** |
| --- | --- | --- |
| HDML | Early mobile browsing | Early feature phones |
| WML | WAP browsing | Nokia, Ericsson WAP phones |
| HTML | Standard web | Smartphones, tablets |
| cHTML | i-mode service | Japanese phones |
| XHTML | XML-compliant web | Modern mobile browsers |
| VoiceXML | Voice interaction | IVR, call centers |