



Symbian OS

Multimedia Framework

Disclaimer

- These slides are provided free of charge at <http://www.symbianresources.com> and are used during Symbian OS courses at the University of Applied Sciences in Hagenberg, Austria (<http://www.fh-hagenberg.at/>)
- Respecting the copyright laws, you are allowed to use them:
 - for your own, personal, non-commercial use
 - in the academic environment
- In all other cases (e.g. for commercial training), please contact andreas.jakl@fh-hagenberg.at
- The correctness of the contents of these materials cannot be guaranteed. Andreas Jakl is not liable for incorrect information or damage that may arise from using the materials.
- Parts of these materials are based on information from Symbian Press-books published by John Wiley & Sons, Ltd. This document contains copyright materials which are proprietary to Symbian, UIQ, Nokia and SonyEricsson. “S60™” is a trademark of Nokia. “UIQ™” is a trademark of UIQ Technology. Pictures of mobile phones or applications are copyright their respective manufacturers / developers. “Symbian™”, “Symbian OS™” and all other Symbian-based marks and logos are trademarks of Symbian Software Limited and are used under license. © Symbian Software Limited 2006.

Contents

- Multimedia (mainly based on S60)
 - Audio, Video
 - Camera
- ... very short overview.



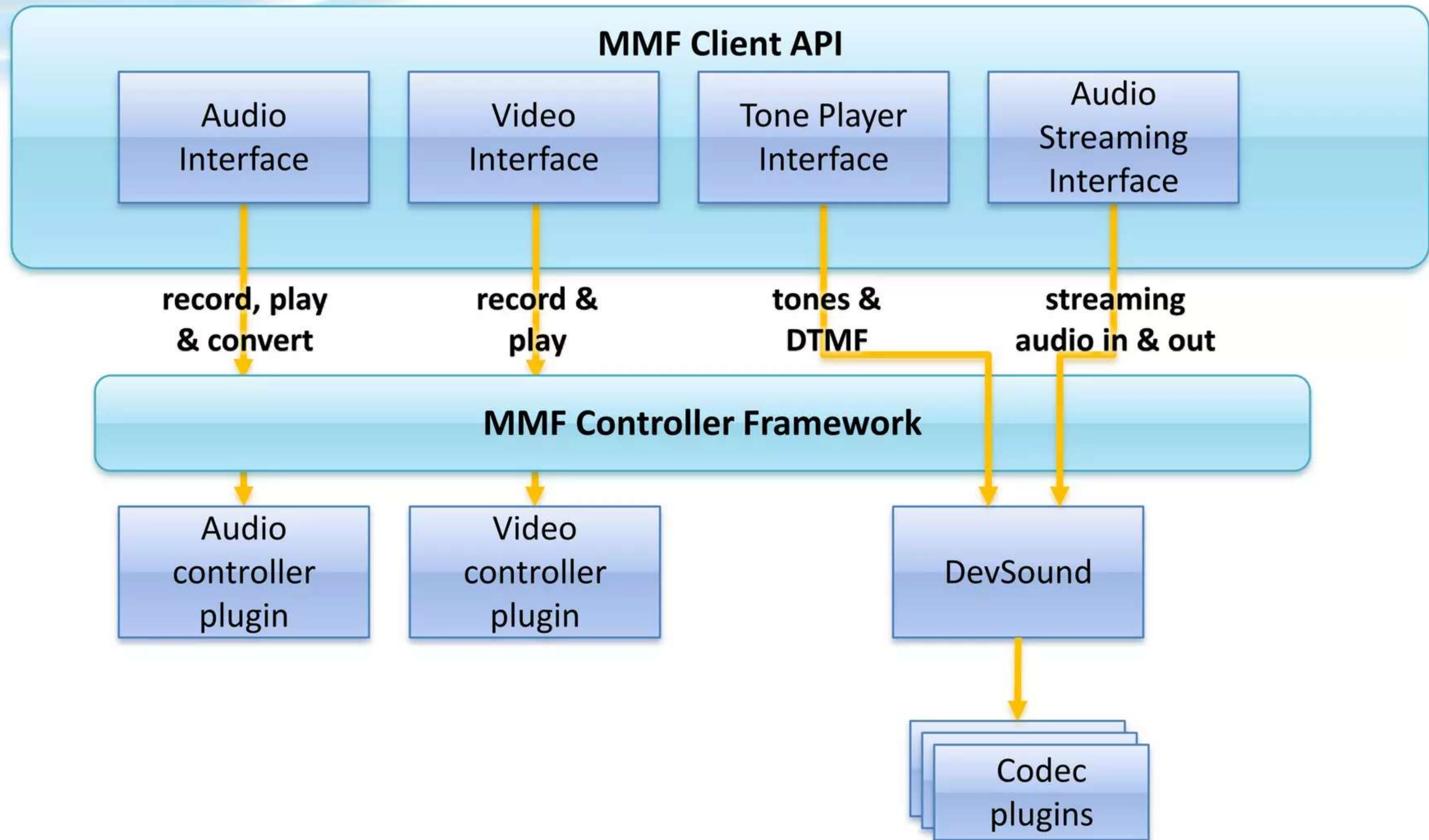
Grafik, Sound and Video

Multimedia

MultiMedia-Framework

- **Plug-ins** for audio and video
- Integrated support for codecs and formats
- Possibilities:
 - **Audio:** play, record and convert
 - **Video:** play and record
 - **Tones:** play (sine waves, DTMF (Dual Tone Multi-Frequency))
 - **Streaming Audio:** play and record (e.g. web streams)

MMF – Structure



MMF

- **Application** communicates with Client-APIs
- **Client-APIs** use Controller Framework
- **Controller Framework** = Client/Server interface, provides functionality through plug-in resolver
- **Controller Plug-ins** provide specific multimedia functionality to the MMF

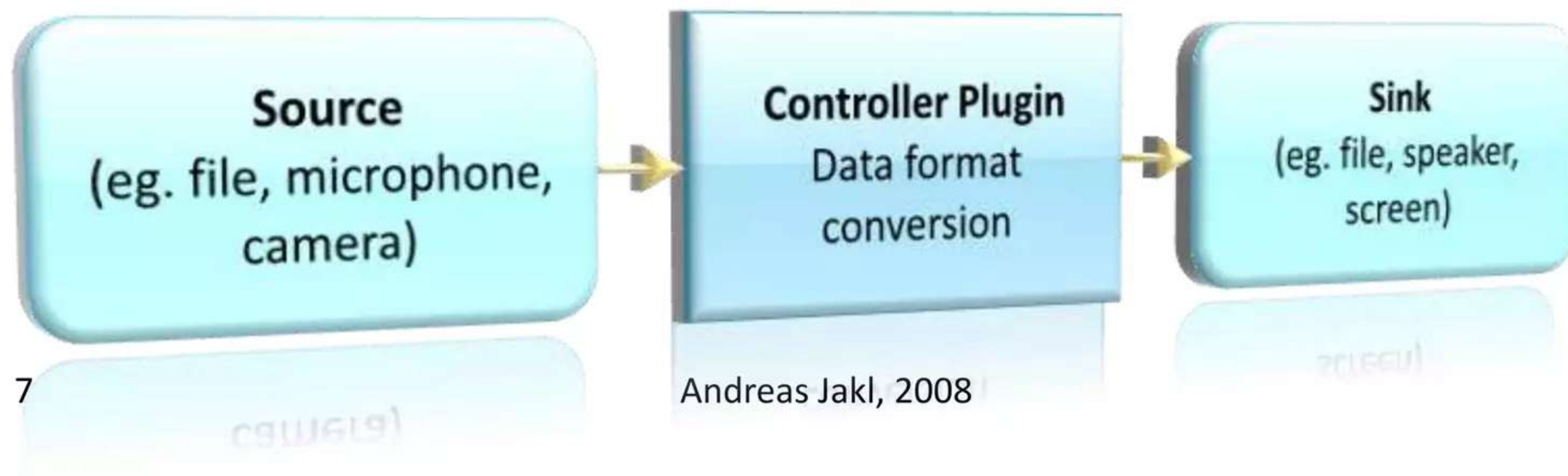


Image Converter Library (ICL)

- Asynchronous **conversion of image formats** between *CFbsBitmap* and *files / descriptors*
- Supports **formats through plugins**
- Client-App communicates with generic class:
 - **CImageDecoder** (file/descriptor → CFbsBitmap)
 - **CBufferedImageDecoder** (multiple files)
 - **CImageEncoder** (CFbsBitmap → file/descriptor)
 - File type through file header or specified as parameter

ICL – Structure

Image encoding

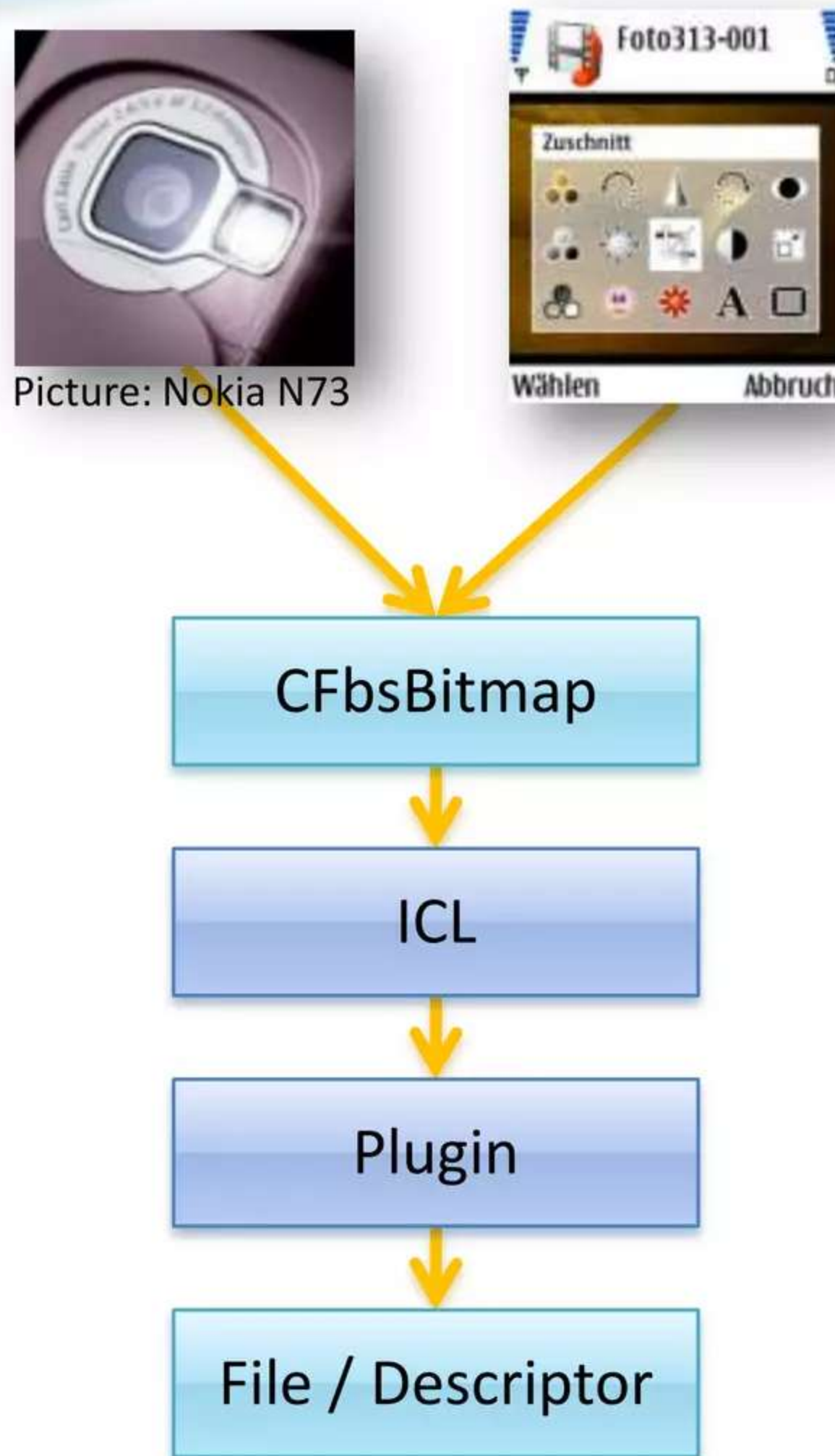
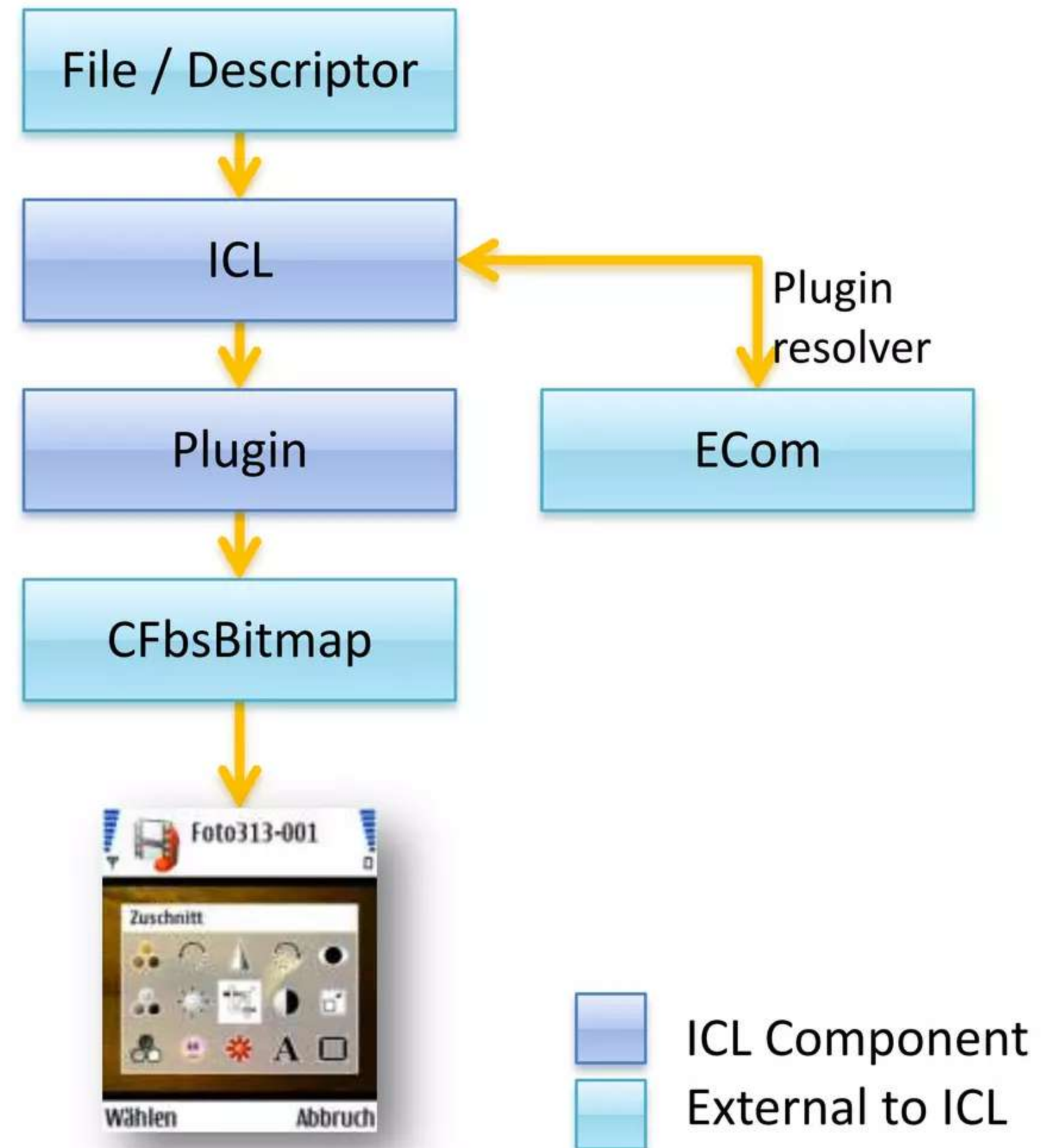


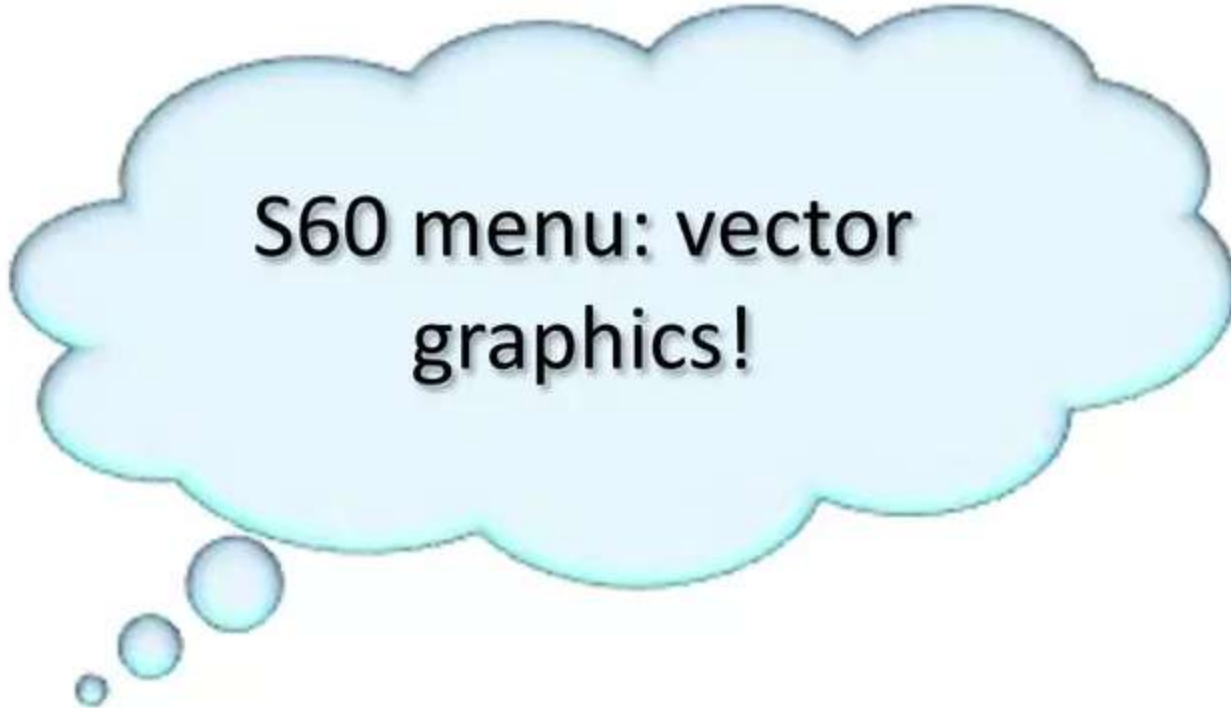
Image decoding



ICL – Formats

Format	Encoding support	Decoding support
BMP (Bitmap)	Yes	Yes
EXIF (Exchangable Image File format)	Yes	Yes
GIF (Graphics Interchange Format)	Single frame, no transparency	Single & multi frame, bitmap mask support
JPEG (Joint Photographic Experts Group)	Yes	Yes
MBM (Multi Bitmap)	Single frame	Single & multi frame
MNG (Multiple image Network Graphic)	Yes	Yes
PNG (Portable Network Graphics)	No transparency	Bitmap mask support
SMS OTA (Over The Air)	No	Yes
TIFF (Tagged Image File Format)	No	LittleEndian and BigEndian sub-type support
WBMP (Wireless Bitmap)	No	Yes
ICO (Icon)	No	Single & multi frame
WMF (Windows Meta File)	No	Std, apm and clp sub-type support

Vector Graphics



S60 menu: vector graphics!

- **Scalable UI** since S60 2nd Ed., FP3
- Support for **SVG-T** (Scalable Vector Graphics – Tiny)
- Combination of multiple SVG files in a single **.MIF-file** (Multi-Image Files)
 - similar to .MBM = Multi-Bitmap Files
- **Loading and drawing:**
 - Create icon: `AknIconUtils::CreateIconL(...)`
 - Set size: `AknIconUtils::SetSize(...)`
 - Show: `gc.BitBltMasked(...)`

Camera (in S60)

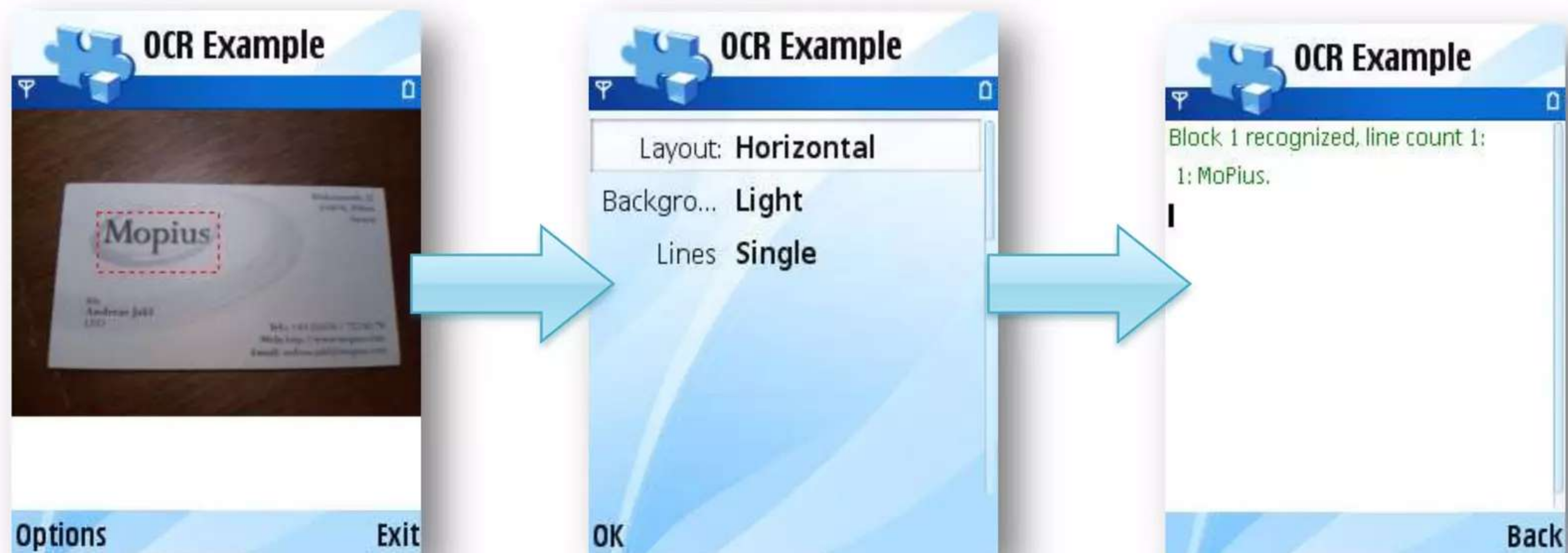
- Differences depending on Symbian OS SDK
(<http://www3.symbian.com/faq.nsf/0/AADD2D771E93636A80257233005922B3>)
- Requires *UserEnvironment*-Capability (User-Grantable)
- Interaction through **CCamera**-Object, Callbacks to object derived from **MCameraObserver**
- Allows setting parameters
(flash, exposure, contrast, zoom, ...)
- No camera support in the emulator

Camera (in S60)

- Camera Capturing (nearly everything is asynchronous!):
 - Create **CCamera-Object**
(no Capability defined: KErrPermissionDenied)
 - **Reserve** camera (CCamera::Reserve())
 - **Activate** camera (CCamera::PowerOn())
 - **Settings:** format, size, frame rate
 - **Capturing** – Options:
 - Single image(s)
 - Video
 - Viewfinder (Send images to specified memory region)

OCR

- Introduced in S60 3rd Ed., FP1 – engine not yet available in devices
- Supports English, Japanese, Chinese
- Two options:
 - Automatic layout analysis
 - Manual regions



Tuner API (Radio)

- Access to **radio tuner hardware**
- Uses MMF for format support, DevSound for playing
- Supports:
 - RDS (Radio Data System)
 - Playing
 - Recording
 - Searching for stations



Try it for your own

... let's move to the Challenges!