

LIBOCON19

# Reusing the Online as an Android app

By Jan Holešovský

**Collabora Productivity**

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# History of LibreOffice on Android



# 2011-2012: “Get something on the screen”

**Pioneered by Tor Lillqvist and Michael Meeks, LibreOffice was cross-compiled to Android**

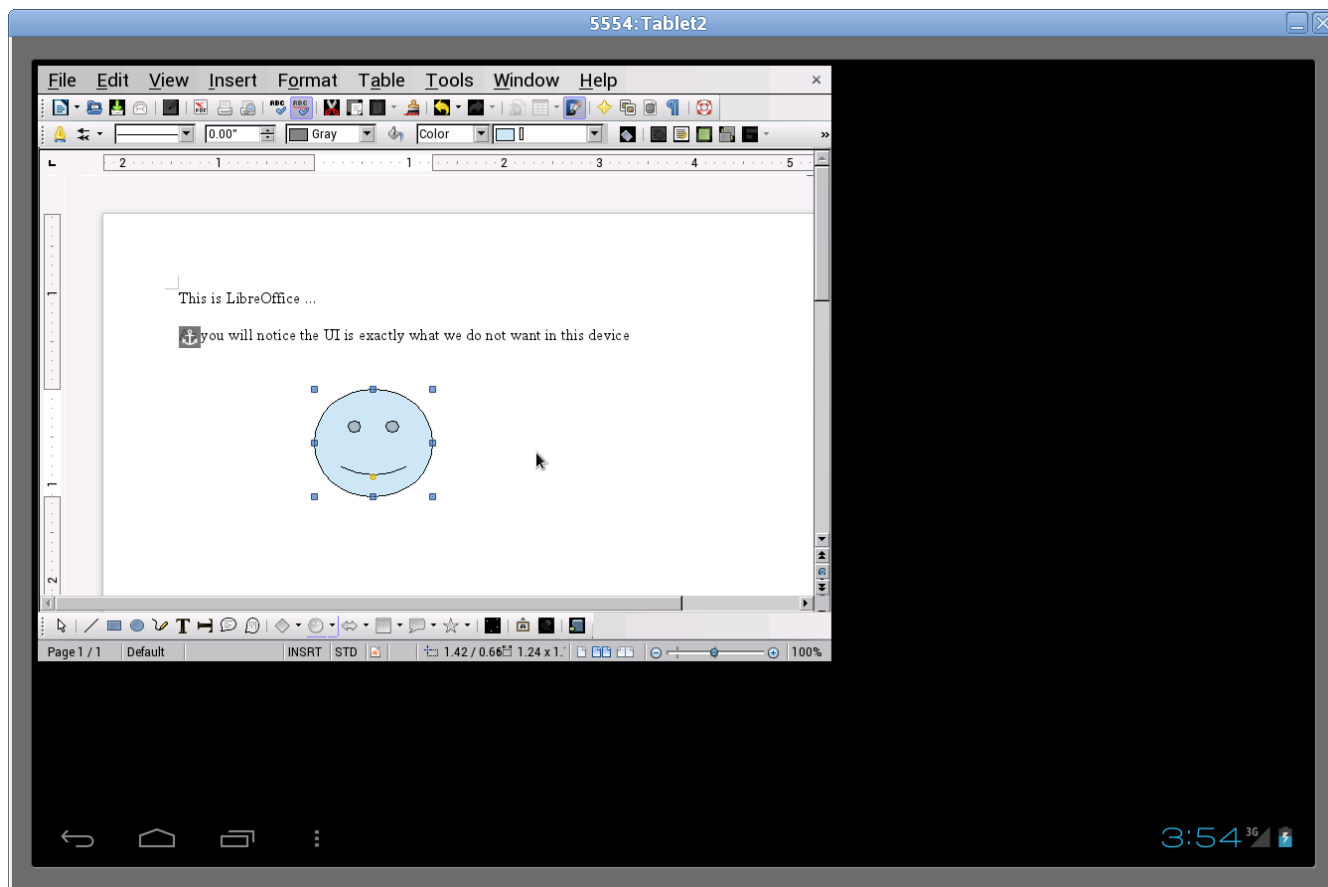
- Sheer amount of limitations on the way
  - Linker – a limited amount of dynamic libraries in one app
  - Fontconfig, using the assets, ...
  - Mergelib, components constructors – Matúš Kukan
  - First loader – Iain Billett
- Debugging a nightmare!
- But resulted in the first version showing LibreOffice on the screen



# The 1<sup>st</sup> iteration just showed the entire LibreOffice UI

Not usable for real work,  
but showed it was  
possible!

- See the menus and toolbars

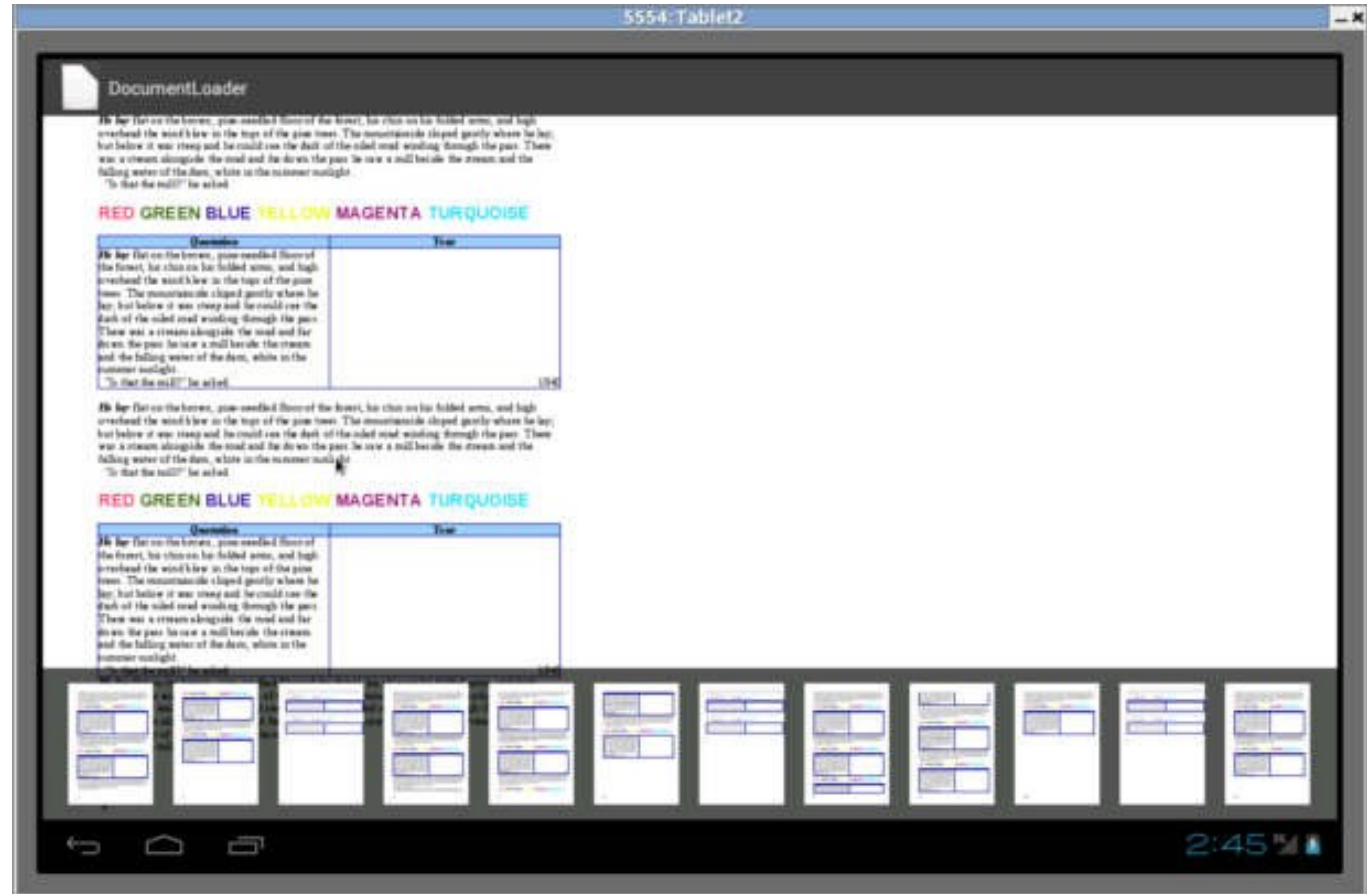




# 2012-2013: Rendering whole pages

## Just a viewer

- But closer to what the mobile UI is supposed to look like
- Scrolling the entire document: problem

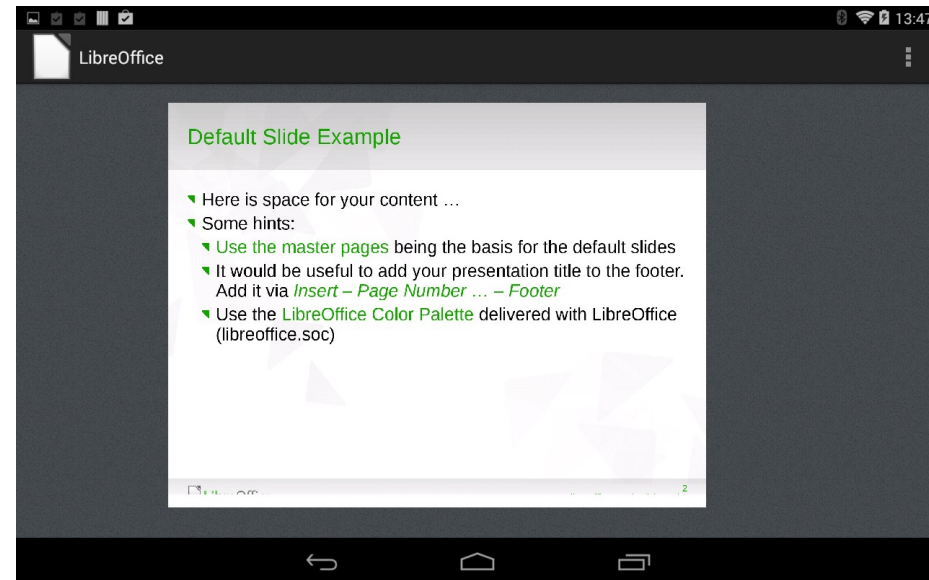




# 2014-2015: LibreOfficeKit used for rendering

## Tomaž Vajngerl introduced tiled rendering into the Android app

- Using the compositing code from Mozilla
- The document consists of “tiles”, each can be rendered separately
- Editing made possible thanks to Miklos Vajna
  - It's easy to re-draw a tile after invalidation!

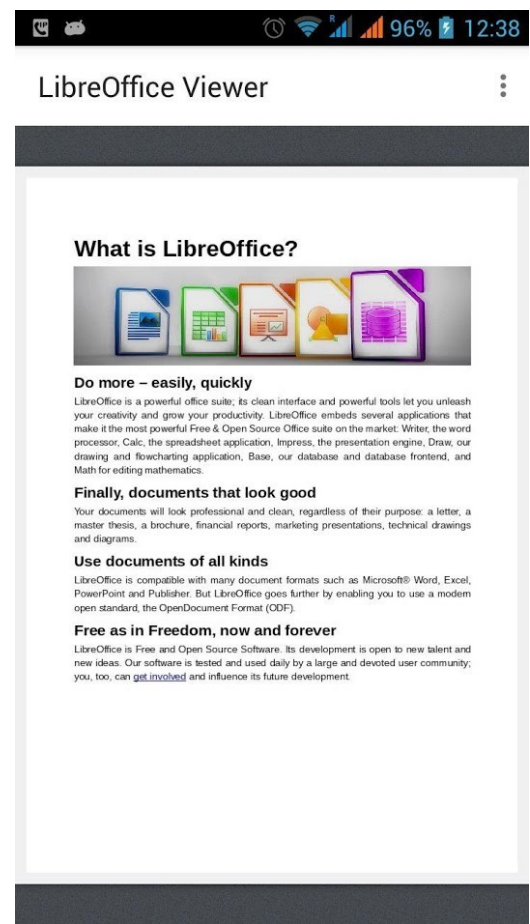




# 2016-2018: More features to the toolbar & elsewhere

Christian Lohmaier, Ximeng Zu, Mert Tumer and many more are adding various features

- But the Android app is not catching up
- Lots of LibreOfficeKit improvements triggered by the Online development





# 2019: Use the Online as the base for the Android app

## Idea the same as what Tor Lillqvist has done for the iOS

- Make the app UI just a WebView
- Reuse loolwsd for the document rendering
- Use the existing JavaScript to compose the tiles, handle the UI, everything...
- Tor has prototyped that for iOS, and it worked, so why not on Android
  - Share code!



# Reusing the Online code on Android



# Loolwsd ported to Android

## Based on the work that has been already done for iOS

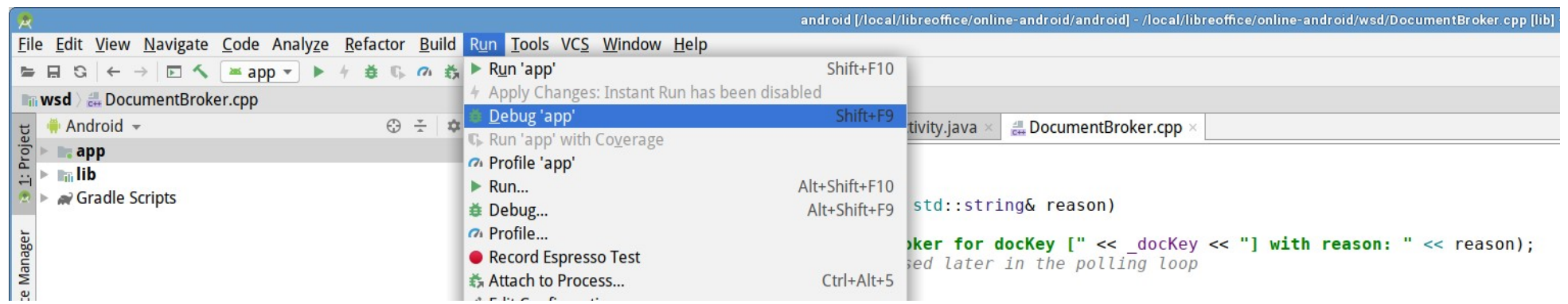
- Liblo-native-code.so had to be adapted so that it can be linked against
- Wanted the building the native code in online.git to be easy
  - Created an 'android/' subdir + the appropriate ./configure option
  - Then it should be entirely possible to build in Android Studio (modulo the liblo-native-code.so from the core.git)
  - Made the online.git part building via cmake Android Studio



# Side-effect: Debugging the native part is easy

## Works directly from the Android Studio

- You have to build the core.git with symbols
- But you want to limit their amount – otherwise linking of liblo-native-code.so takes ages
- See the details in online.git's android/README





# Minimal app created

## WebView over the entire screen

- Had to make the communication between the JS in the WebView and loolwsd working
- Using the FakeWebSockets the same way as the iOS app
  - JS → native: **`mWebView.addJavascriptInterface(this, "LOOLMessageHandler");`**
    - Methods on 'this' annotated with `@JavascriptInterface` can be called from the JS as `LOOLMessageHandler.<name>`, eg. `LOOLMessageHandler.postMessage(...);`
  - Native → JS:  
**`mWebView.loadUrl("javascript:window.TheFakeWebSocket.onmessage({'data': " + message + "});");`**



# Lots of functionality ported from the ‘old’ app

- The entire “LibreOfficeUIActivity” - that takes care of the initial document selection
- Associate the files with the editing activity
- Unpack assets that need to be read by the native part
- Displaying the License and the Notice
- Settings



# New features via GSoC – thanks Kaishu Sahu

- **Print support:** One can print the document with the printer connected to the same network.
- **SlideShow support:** The user can view the document in the full-screen mode.
- **Insert Image in the document:** This allows to insert the image in the document from the phone's gallery.
- **Share document:** The user can use the existing messaging applications to share the document from the LibreOffice.
- **Save\_As the document:** By this, one can make the fresh copy of the document anywhere in the storage media.
- **Rationale dialog for permissions:** To give the better understanding of a particular permission.
- **Launcher shortcuts support for api > 24:** The user can open the recent documents from the launcher (only if the launcher supports the shortcut feature).
- **Support for other document formats in save\_as and share feature:** The user can choose the format of the document in which they want to share/save it.
- **Dimming the document when inactive.**



# Bugfixing

## Huge challenge: Fix the lifecycle

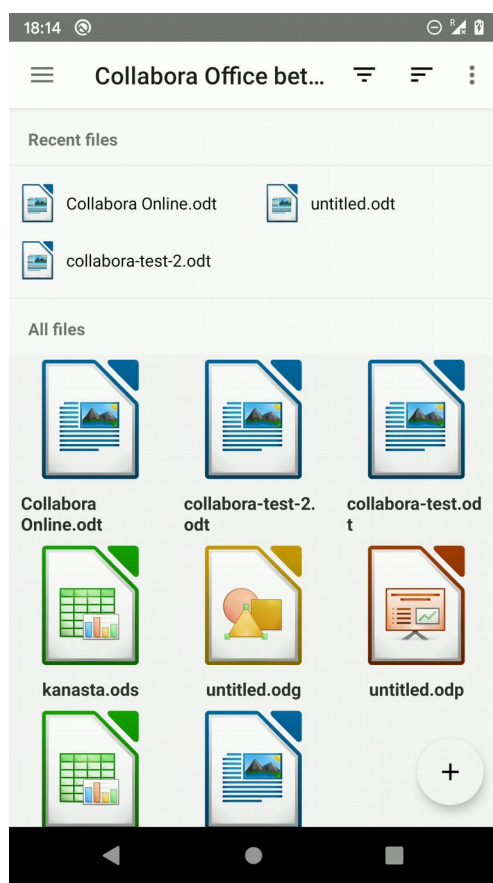
- So that switching to other apps work, without too much reloading / re-starting
- And that 2<sup>nd</sup> opening of the document work
- Ordering issue at the start; and more...

## Various other fixes

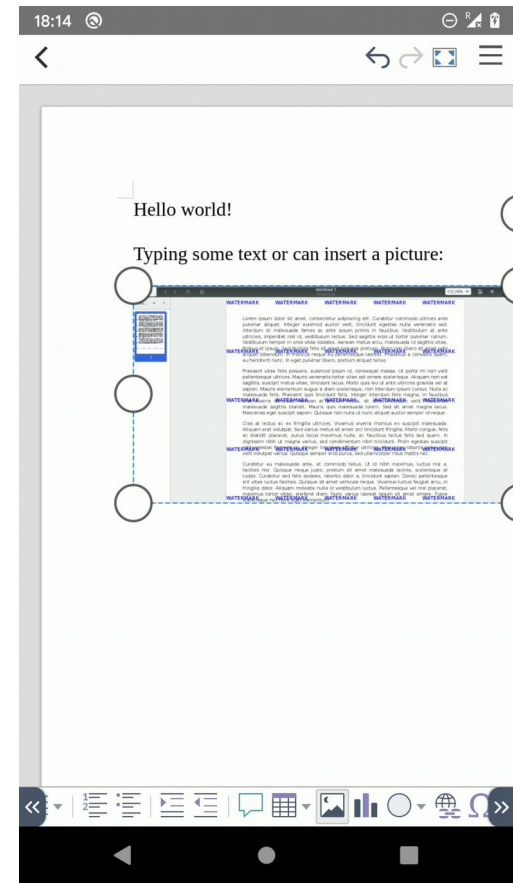
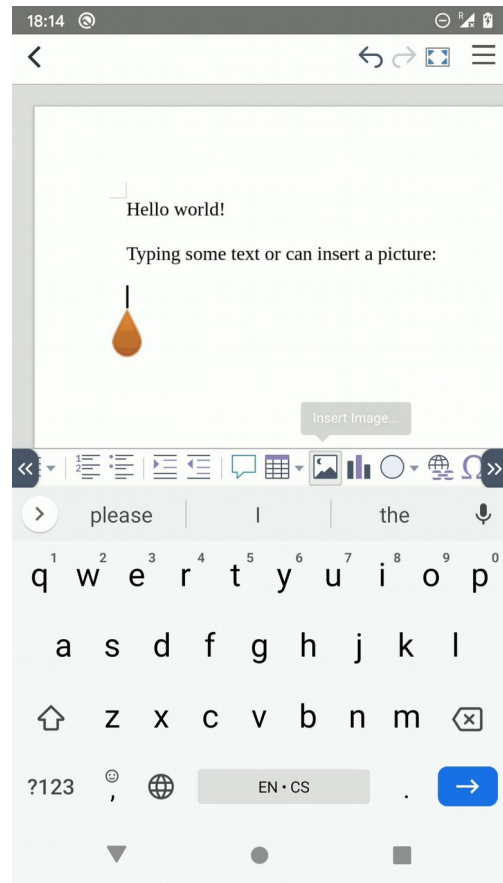
- Startup time – was huge thanks to the fontconfig / built-in fonts
- Some crashes, etc.



# Demo (video)



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**Future steps**



## More to do

- Profile the text input
  - Suspect that the **WebView.loadUrl("javascript:...** takes a lot of time
  - If it's the source of slowness, should be possible to use a websocket to localhost
- Still sometimes the document does not load
  - And presents a “File not found” dialog box
- Update the document creation code
  - At the moment, we just copy a file to the new location; instead the TemplateSource property should be used
- Maybe few more fixes – but these are the most pressing



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# Thank you – and get involved!

- Familiar development in Android Studio
- Steps how to build:
  - <https://gerrit.libreoffice.org/plugins/gitiles/online/+/master/android/README>
- Many thanks to: **Florin Ciornei, Gülşah Köse, Kaishu Sahu** – who committed to android/ in online.git

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