HD+ OpApp development
From takeoff to successful landing

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Introduction – TPV explained

TPV Products include various types of monitors, TVs, mobile phones, tablet PCs and other Display products

~30,000 employees worldwide

OBM/ODM business:

Philips brand
• To develop an HbbTV Operator Application:
  – structural cooperation needed between the operator and the manufacturer
  – to make it a seamless experience, deeper user integration needed
  E.g. the installation of the OpApp on top of a native satellite list requires co-work between operator and manufacturer

→ All of the above is captured in the OpApp Bilateral agreement between the manufacturer and the operator
Introduction – HbbTv app vs HbbTv OpApp

Current HbbTV shows
Broadcaster apps

HbbTV OpApp spec
- Allows operator UI on TV
- Requires authentication by TV manufacturer

shows broadcaster application

OK key starts Operator UI

Guide key shows Operator EPG

+/- shows Operator Zap Banner
• Horizontal market development, 1 serves all
  – Making use of open industry standards
  – No HW dependency with respect to DVB Conditional Access

• Platform development explained
  – TV ranges build-up using different platforms
    • Some Android based
    • Some linux based
  – Average platform development lead time: 9 to 12 months
Takeoff - Different aspects to consider

• Determine the stakeholders: internally and externally

• Finding the right vehicle to enable takeoff:
  – Timeline of OpApp integration needs to match the platform development timeline
  – Match found in our Android upmarket platform

• **Bilateral agreement** with operator:
  – Commercial: icon positioning, contract, when/how to introduce, marketing
  – Technical aspects: Requirements discussions, performance expectations, security aspects,...
Takeoff - Stakeholders

Ghent, Belgium
TP Vision Belgium N.V.

Munich

Xiamen, China
TPV Display Technology (Xiamen) Co., Ltd.

Taipei, China
Top Victory Electronics (Taiwan) Co., Ltd.

Bangalore, India
TP Vision India Private Limited
• Business terms:
  – **Quality assurance**: How to ensure the OpApp and Tv behave as expected
    → Testing organization is crucial in this:
      o Multi-site setup: who tests what, how to test,…
      o Test case coverage to handle both functional, integration, stability as performance requirements
  – **Software updates**: How to handle SW updates of both the OpApp and Tv → all should remain functional at any time for the end user
  – **Branding**: How to represent the OpApp to the end user
Bilateral agreement – Application aspects

• Application provision and framework:
  – **Application provision**: describes the preconditions for the OpApp to run e.g. size, discovery mechanism, network required
  – **Application framework**: describes the behavior of the OpApp
    • Description of first time installation
    • Launch of the OpApp: which keys are entry points, which page to display
    • Error handling in case something goes wrong
Bilateral agreement – **Security, Scope, Capabilities**

- **Security**:
  - How to handle authentication of the OpApp
  - How to exchange and manage the certificates

- **Scope** of Operator Application
  - Describe the UI interaction: where to replace the TV UI by OpApp UI
  - Key handling: which keys are handled by the OpApp

- **Terminal capabilities**:
  - Describes the channel list management and potential use of optional APIs
Impact of COVID

- Project timing: Q4 2020 – Q3 2021
- No onsite workshops, no F2F meetings
- Workaround using regular telco’s and virtual one roofs
- Work multi-site based on same environment: embedded CA test app, test bed

→ Time loss in establishing requirements baseline and debug of system issues (needing stakeholders from different sites/timezones to debug)
Turbulence along the way

• First time OpApp development
  → Requirements baseline is essential component of the bilateral agreement
    • Expectations from operator and manufacturer must match: feature usability, messages shown to user, ...
    • Allows the preparation of test material
    • Covers handling of security aspects like certificate handling

• First time embedded CA system
  – SOC supplier co work with CAS supplier (Nagra)
The landing

- Staged introduction to the field of OpApp capable TV SW
- First TVs launched in June, HD+ OpApp introduced in October
- Different means used to control the staging of TV SW:
  - IP Pull: Enable HD+ OpApp for customers actively ‘looking’ to update the SW of their TV set
  - IP Push: Enable HD+ OpApp for all customers who have enabled automatic SW update
  - Production: Introducing HD+ OpApp enabled SW into production
Safety instructions – Lessons learned

• We stayed close to the HbbTv standard (avoid proprietary fixes)
  – Gain for manufacturer: allows easier integration of other OpApps
  – Gain for the operator: allows easier integration of other brands

• Open and direct Communication
  – supported by tooling: Slack, Confluence and Jira
  – this feeds into the trust relationship between manufacturer and operator

• Clever setup of the test environments
  – Access to live recordings for all development teams: most stakeholders not in EU hence outside of the satellite footprint
  – Automation of stream capturing and deployment across the globe (India, China)
Conclusion

• First time development effort done in spite of Covid
• Looking for new engagements