

WHITE PAPER

Smart Front Panels

Leveraging the power of the
Mobile Operating System ecosystem

By Ranga Raj, January 2011

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Smart Panels

Introduction

Traditional printers and MFP devices have had proprietary front panels, and over time have become larger, color, touch screen capable, etc. These panels have exposed the features of an MFP and in some cases allowed OEM specific Web services/Java-based applications to run from them. Front panels either provided a browser experience or native applications to be run, and enabled access to content resident on other systems located within the intranet or across the Internet in a controlled and secure manner. The challenge for Printer OEMs has been to attract application developers to embrace their platform, and for application developers the pains involved in porting their applications across various OEM flavors of frameworks has been a nightmare. Service Oriented Architectures based on Web 2.0 are becoming the defacto standard in the CIO's strategy. These application frameworks were restricted to the more expensive, higher-end models of MFPs and could not be brought to the consumer/SMB markets – hence a common framework to address the entire fleet remains an unsolved problem for Printer OEMs.

Why Smart Panels?

Application Ecosystem

With the emergence of smartphones and tablets, a new and rapidly growing ecosystem could have an answer to this problem. Application developers, whether they are individuals or large companies, have taken advantage of Apple's iOS, Google's Android and RIM's frameworks. The applications available across these platforms number several hundred thousand and are growing at double digit rates. These applications span from inconsequential

consumer apps to serious enterprise apps. Applications developers have traditionally targeted the PC based OS – MAC or Windows, Browser environments and now the emerging smartphone/tablet ecosystems. If Printer OEMs could think of their front panels to be such a screen that enables a subset of applications that need the services of an MFP, this could be a tremendous win-win situation and lead to growth in the usage of MFPs.

Dynamic Transformation Capability

The power of smartphones or tablets has been the ability of applications (and in some cases add on peripherals) to morph the capability of the device to become the equivalent of another device – e.g., Remote control, GPS navigation, BP machine, etc. Taking advantage of this capability, traditional MFPs that had a fixed set of features from the moment they were shipped to their end-of-life, can now be looked at as dynamically-configurable machines whose capabilities applications transform based on need – either for specific verticals e.g., HIPPA compliance for Healthcare, or security applications and authentication for Government – or for changing needs as they get shifted from one department to another. Printer OEMs have struggled with the time to market challenges of variants of products (with common base capability) to address specific needs of different verticals or applications/geographies. This new approach has the potential to significantly alter the traditional approach and the ability of Printer OEMs to re-look at their product roadmaps and time to market. Combined with remote device management and configurable frameworks, the ability of OEMs –either through an app store model of monetizing features/application bundles that transform a standard MFP to a specialty MFP suited for a particular vertical, or through a managed print services (MPS) model – will dramatically change.

Elements of a Smart Panel

Base Features

The standard capability of an MFP – scan, fax, copy, print functions in addition to configuration and setting, is typically found in traditional front panels and this would continue to remain the base foundation. Most MFPs either have an embedded Web server or similar frameworks to expose these capabilities. These base set of features are exposed to users in two ways – a traditional front panel set of features or application enablement.

Traditional Front Panel Feature Enablement

The base feature set is exposed to users with the OEM's look and feel (from a UI perspective using themes and styles if based on Android). Based on user privileges, end users or administrators could be presented with different capabilities of configuration parameters.

Application Access Enablement

Each of the mobile operating system platforms – Apple, Android, RIM, have a vast number of application developers, applications and distribution channels for these to be consumed. The application enablement of MFP capability is an extension of mobile cloud printing capability (refer Thinxstream's white paper on mobile cloud printing strategy), by exposing applications to not only the print path of the MFP/Printer, but the remote control capability to scan a document to the smartphone, or to fax a document, or to make copies of a document. Applications on the smartphone can now be enabled to utilize the entire set of MFP services.

Use cases could be Scan to application/folder, and if the formats of the scanned image need to be

transformed to a format compatible with a target application, appropriate cloud services can be invoked to complete the workflow.

In the case of dedicated smart panels based on Android, "methods" for print, scan, etc. can be exposed as extensions to the SDK for application developers to build MFP-aware applications. Extensions to the Libraries and Kernels of the Android OS are also necessary during the integration with the controller and the embedded Web server. A similar approach could be taken for the other two platforms – iOS and RIM, to enable the applications to invoke the MFP services.

Stage 3 applications in a Managed Services Environment (document workflow, etc.) can now integrate with the hardware through the Android SDK or similar extensions for other Mobile Operating System SDKs.

Dynamic Transformation Capability Enablement

This is an extension to the application enablement, in conjunction with remote application and device management frameworks, whereby an application or a set of applications combined with configuration changes can dynamically transform an MFP to address a unique requirement.

Implementing Smart Panels – Approaches

There are two main approaches to smart panels – either a dedicated front-end hardware that complements or replaces an existing hardware panel, or a remote smart panel approach of moving the front panel capability to smartphones or tablets as an application.

Dedicated Approach

This approach is similar to the current front panels of MFPs/Printers and would be looked at as a replacement strategy. Most front panels today are based on grounds-up engineering to meet a price point. There is minimal reuse of code and thus they often have different usability features across the family of products and lack a common look and feel. A few manufacturers have used style sheets with HTML, Java or Flash frameworks to achieve this, but due to constraints of hardware, a common environment is often not achieved.

With smart front panels, the business driver is not necessarily just cost, but functionality. Access to applications and content drives more usage of the device increasing tone revenue. This is common

across consumer, SMB, Enterprise markets. The other key driver is the dynamic transformation capability of the feature set to meet a market need.

The choice of hardware could be based on a single processor driving the controller as well as the smart panel at the low end, to higher end models having multi-touch large screens with dedicated hardware. The mobile platform choices today fall under two categories: Open or Proprietary.

Proprietary Platforms

RIM, Apple are examples of the OS and hardware coming from the same manufacturer and not being made available to others. These would not be the best choice for smart panels, due to price and lack of multiple sourcing options.

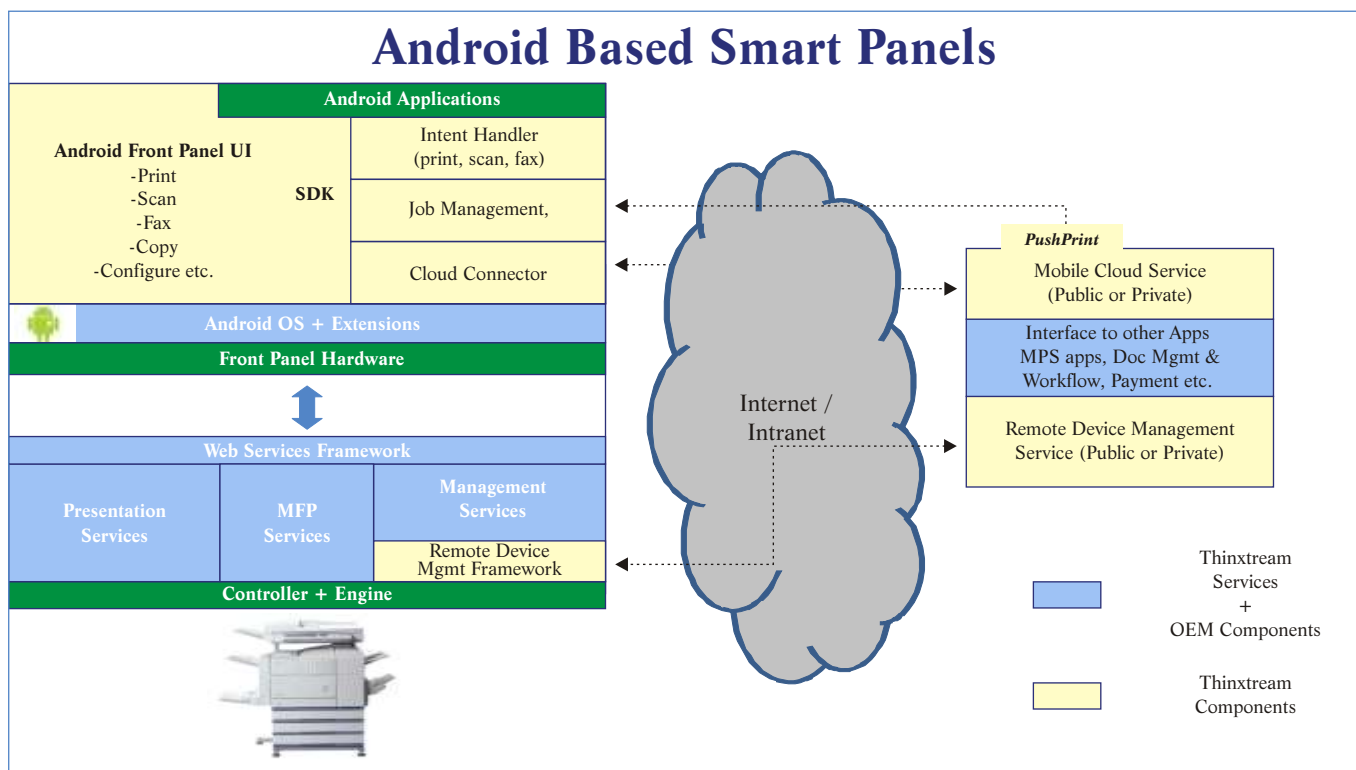


Figure 1 – An Android based solution

Open Platforms

Android, Microsoft's Windows Mobile 7, MeeGo are examples of software platforms that are supported by multiple hardware manufacturers. The economies of scale & competition, especially with Android, enable customization and multiple price points based on features and functionality. Some of these platforms are deployed across other products such as Set Top Boxes which add to the volume and bring the cost down. Non-Android Platforms are in the infancy, and though may meet price points, but lack the developer/application base which is the main reason for adopting this approach. Android is the front runner amongst the open platforms as of today.

Application Approach

This approach leverages the mobile platforms – both proprietary and open, and allows users to load up a smart panel application, which transforms the smartphone/tablet to a remote front panel - similar to the way TVs and Home automation systems can be controlled and managed. A good analogy of such a capability is the Slingbox which enables users to remotely connect and control a device through an IP network. The feature set could include traditional front panel feature set as well as applications enablement. To enable this, the smartphone/tablet needs to be in the proximity of the MFP/Printer and connected via IP.

Summary

To enable any of these approaches, the components available from Thinxstream Technologies can be integrated with the components from the OEM to create a unique differentiated offering. Figure 1 shows a solution scenario based on Android. This involves additional services for integration and customization. Thinxstream is the ideal partner of choice that can deliver these components and services to dramatically shorten the time to market in a cost-effective manner.

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