

UP³I –Universal Printer Pre- and Post Processing Interface

Connecting Print Production for Profit

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Abstract

The Universal Printer- Pre- and Post-Processing Interface (short: UP³I) Specifications Committee was formed in the year 2000, with the intent to provide a seamless specification for the interface between the printer and the pre and post processing and finishing devices. This common device level communication standard benefits the digital printing industry by giving customers far greater productivity through faster set-up times and greater communication between devices in a single print manufacturing process. The core group members of UP³I are Duplo International Ltd., Hunkeler AG, IBM Corporation, Océ Printing Systems GmbH, Stralfors AB, and Xerox Corporation. Recognizing the benefit to the market, many other vendors of digital printing products have already joined as “Associate Members”.

Introduction

The UP³I initiative was formed to establish an internationally binding communications interface for all hardware components in a process line.



Figure 1. UP³I devices - with an neutral, vendor independent design

UP³I is based on an open vendor-independent non-proprietary standard enabling integration with present and future workflow management standards. It enables integration with other workflow standards, such as JDF developed by CIP4, by being the conduit for job ticket

and control information to reach every device in the digital print line.

In today 's fast-paced and cost-conscious market, it is more important than ever to make print production line more productive —and that is what UP³I is for. This industry standard enables centrally control of all devices via one unified interface, regardless of the manufacturer of the printing and finishing devices. With UP³I's open and expandable design for networking equipment, unleashed productivity and unprecedented process control— backed by long-term investment protection is witnessed.



Figure 2. official UP³I logo (Trademark)

Get on the Track to Higher Productivity and Profit

Significant productivity gains are just around the corner with UP³I. This industry standard breaks down proprietary barriers and enables operators to centralize command over digital printing and finishing equipment into one smart interface. With UP³I, following rewards can be reaped:

- Integrate UP³I-enabled devices and software and upgrade the power of dynamic workflow with faster, continuous and reliable throughput.
- Speed up the set-up time for entire production from a single, automated point of information or even operation — the unified UP³I interface.
- Confidently accelerate the printing pace and time-to-market, and free up valuable operator time.

With this new level of integration, specific printing and finishing instructions in job tickets (like CIP4 's

standard “JDF ”), can be used and UP³I sends this information to all UP³I-enabled equipment. What needs to be printed, how it needs to be printed, and how to finish it.

Control Your Production Process In Ways You’ve Only Imagined

UP³I delivers an easy-to-use single point of control over production. Not only does the UP³I interface talk to UP³I-enabled devices, the equipment brings also information back to the user. This allows to:

- Print documents more confidently. UP³I-enabled devices communicate back to the interface and continually inform operators about the status of the entire production line —including notifications like suggestions for synchronized maintenance timing etc.
- Optimize production, as UP³I reduces the effects of human error, by confirming the specifications required to correctly process jobs.
- Eliminate print processing marks on your documents. As UP³I codes each page with a package of information that is carried throughout the process, you ’ll no longer need to produce these unsightly marks —producing better-looking documents.
- Flexibly control varied output and finishing, with UP³I ’s job separation and delivery capabilities. These makes shorter runs easier to manage and more profitable.

UP³I Protects Your Long-Term Investment — and Your Freedom of Choice

What does UP³I mean to your organization? A significant increase in your solution choices, as this intelligent interface is an open, non-proprietary standard. Not only can you connect and integrate new UP³I-enabled equipment and most existing printers and finishing devices into your network, but we also expect even more companies will climb aboard. This will open up even wider solution possibilities to customers. With UP³I, you can more easily expand and update productive equipment as your business grows, and adapt it to fit your profit-driven printing process chain. Over time, newer interface versions will be developed offering additional benefits, and you can be confident that your UP³I-enabled equipment will be as productive as when you purchased it. And the result? Investment protection for the future —with UP³I connecting your print production for profit.

Architecture Overview

From a technical point of view the UP³I interface uses a peer to peer protocol. On physical layer, UP³I is built upon the well established IEEE1394 interface with native frames. The UP³I logical layer is strongly adapted to the existing print production environment (e.g. IPDS).

UP³I relevant information is communicated synchronously to and from the printer device together with the print data along the so far used path. The additional needed finishing parameters are specified in the concerning interface environments. Former not available administrative and reporting queries are now asynchronously possible via the UP³I manager device. This simple element is mostly integrated to the UP³I printer device. It converts an external request to the low level UP³I protocol and behaves so as an Ethernet / UP³I bridge. Additionally the UP³I manager hosts respectively bridges the graphical user interfaces of the production line.

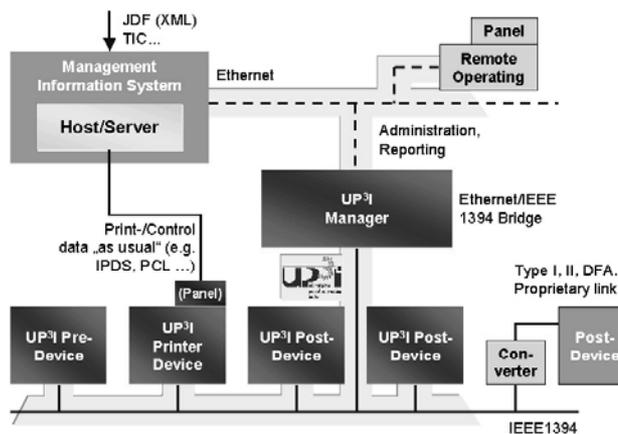


Figure 3. UP³I Architecture Concept

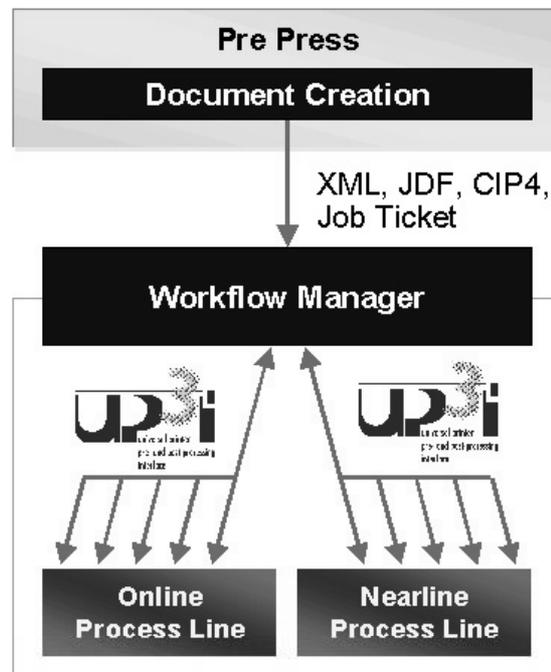


Figure 4. Architecture Overview

Adaption AFP / IPDS / UP³I Workflow

To enable UP³I advantages within an IPDS production environment, IBM's owned IPDS[®] (Intelligent Printer Data Stream Specification) specification was also enhanced with UP³I commands. These newly implemented functionality now guarantees a smooth production flow from document to finished product. Due to the easy extensible structure any future device functionality will be integrated into this mechanism.

CIP4 / JDF Corporation:

The CIP4 (Cooperation for the Integration of Processes in Prepress, Press and Postpress) Association and the UP³I Group. agreed to cooperate, for mutual benefit and the benefit of the industry to coordinate technical standards, studies, and development activities where synergies between the respective organizations can be maximized.

The organizations specified together the areas in which each organization has a distinct competence, and to which each will endeavor to defer to and avoid duplication of effort.

Convergence of Xerox Machine Module Interface (MMI) with UP³I

At a recent meeting of the Core Technical Group of the Universal Pre-Post Processing Interface Committee (UP³I), it was decided to converge the machine interface used by Xerox today, Machine Module Interface (MMI) with UP³I. Additionally, the group made the decision to have a year to focus specifically on completing the development of the UP³I Specification v.2.0, which will include several updates, of which MMI will be one. Specification v.2.0 will not have any significant changes in functionality, but will include updates to continue to leverage and include the industry Job Definition Format (JDF) from the CIP4 committee, and efforts like this one with Xerox and MMI.

Current Status:

With the first implementations of UP³I a range of features is available including automatic job changeovers, real-time process control, automatic waste reject, automatic job recovery and reprinting, single point of operator control, dynamic finishing and delivery control and enhanced document appearance. The new interface increases the customers' productivity, optimizes production workflow and saves the expenses of implementing several different interfaces.

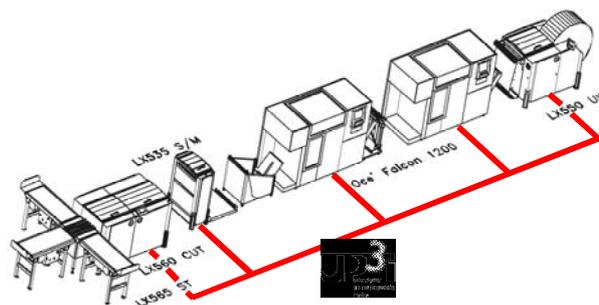


Figure 5. One of the first customer installations with UP³I

References

UP³I Specification; UP³I Limited (www.up3i.org)

Biography

Christian Sack, 36, graduate engineer from the renowned university of applied sciences in Munich, Germany, is manager in the technology department at Océ Printing Systems in Poing. Since 1992 he is working in the printers development area for Océ, currently as project leader and group head. His current research interest at Océ includes electronics and sensors. From start of the international project UP³I he is in charge of this organization.