

Automated exchange of quality parameters with XJDF

Two-part CIP4 XJDF Quality Control ICS available:

CusQC ICS and MisQC ICS can now be used for interface development in quality workflows

The CIP4 organization has published two parts of the "XJDF Quality Control ICS" called "Customer to Quality Control (CusQC)" and "MIS to Quality Control Device ICS (MisQC)". An Interoperability Conformance Specification (ICS) is an additional specification that combines elements of one or more overall specifications that are relevant for a purpose-oriented issue and precisely defines specific parameters, properties and options to be expected. An ICS thereby defines the logical interaction of the central controller and the other actors in the value chain. With such clear tools, which enable the manufacturer-independent interaction (interoperability) of systems and solutions, software and interface developers can reach their goal more quickly and efficiently.

The QC working group was formed on the joint initiative of CIP4 and bvdM (German Printing and Media Industries Federation, Berlin, Germany). Depending on changing tasks, it has about 15 members from the printing industry as well as from software and press manufacturing companies.

XJDF QC ICS = CusQC ICS + MisQC ICS

The two-part XJDF Quality Control ICS is designed to summarize and automate the exchange of quality control data over a print run or product. The CusQC part maps the quality-relevant processes between the customer and the print provider, whereas the MisQC part defines the exchange of quality data internally between the print shop MIS or color measurement software and networked production systems. Aligned to ISO color standards, CusQC defines the quality requirements at a high level. MisQC organizes the individual measurements and measurement summaries in production systems. All quality data can be automatically stored in an MIS or specialized quality monitoring software.

Together, CusQC and MisQC enable a seamless quality workflow from customer to production system and vice versa. The initial focus was on color in general, i.e. the definition of color measurement scenarios and parameters and their communication, but also on additional quality features such as register quality. Thus, the current ICS parts largely cover process quality from prepress to press. It is planned that the next versions will supplement both parts with the process quality of postpress and inspection systems. The QC working group is therefore asking for active cooperation from solution providers.

Software and interface developers can get started

But even at this stage, developers can begin to incorporate the essential ICS elements into their solutions. CusQC facilitates customer print service provider communication in online portals and in the integration of software solutions for quality assurance and quality monitoring. MisQC enables on the one hand the integration of CusQC into the central planning and management solutions (MIS, ERP software) and on the other hand its bidirectional communication with the production environment (measuring devices, sensors and interfaces at printing presses and control consoles). Bidirectional communication means that XJDF data is sent via the interfaces not only for production control, but also for quality control. This data is immediately returned in the form of XJMF quality measurement data from the measuring devices and production system sensors to the MIS/ERP. When implementing XJDF/XJMF, developers can modify existing JDF/JMF interfaces. However, a higher level of integration of measuring systems and sensors is required to achieve full automation.

ICS for automated transactions has been available since December 2019

The first XJDF-ICS was published at the end of 2019. The "Customer to Automated Print Procurement ICS (Cus-APP)" automates the transactions between print buyers and print / finishing service providers and makes it easier to map commercial processes in real time. It combines the relevant elements of XJDF 2.0 and PrintTalk 2.0. The main reason for providing such an ICS was the growing share of online printing in print procurement. The Cus-APP ICS, together with the Quality Control ICS that is already based on XJDF 2.1,

will facilitate the implementation of the new XJDF standard in practice. Although the Quality Control ICS is aligned with the Cus-APP ICS, it can be implemented independently.

XJDF brings a paradigm shift compared to JDF

XJDF, the "Exchange Job Definition Format", is the continued development of the widely used "Job Definition Format" (JDF). The XJDF specification had already been published in February 2018 as the JDF upgrade JDF 2.0 = XJDF 2.0. The original JDF will continue to be supported and developed for existing workflow solutions and machine interfaces.

The significant differences between JDF 1.x and XJDF 2.x are shown in the attached table "Paradigm Shift with XJDF". In short, a job ticket rich in redundant or internal parameters is transformed into a leaner, yet more detailed exchange format, as the name "Exchange JDF" already suggests. XJDF will enable the value creation network to react intelligently and act with foresight.

Paradigm shift with XJDF

Issue in JDF 1.x	New paradigm with XJDF 2.x
<p>From a rigid job ticket ... The model of the analog job ticket was not practicable digitally because all job data had to be communicated to all machines, even if only simple information was being transmitted. This is why JDF ultimately became the communication protocol between applications and machines.</p>	<p>... to a simple, expandable exchange format XJDF has therefore been structurally simplified compared to JDF - with the intention that production systems and applications can be integrated quicker, easier and more robustly. XJDF is now designed as a pure exchange format ("Exchange JDF") that can also be extended by programming. It describes both the interface between the customer and the central "MIS" and, on both the customer and production side, the interface to the applications and machines in production that execute specific instructions.</p>
<p>From a redundantly specified job ticket ... JDF was designed to be a complete electronic job ticket. In JDF, there were several ways of describing things in the right level of detail, but no fixed place to describe them. Despite updates at each process station, there was no strict sequence. So the applications had to search for the attributes in a large file.</p>	<p>... to a clear product definition XJDF avoids redundancies in the specification, i.e. the number of methods used to describe similar product and process features are limited to a single case if possible. The process and system settings are mostly generated automatically from the PDF and now describe products in a clear manner in a unique sequence of steps. This means that a complete ticket is no longer generated and passed on, but always only one transaction between a controller and individual applications in the process.</p>
<p>From inadequate description of the real world ... Only one product fit into the digital job bag. Product changes, gang jobs and versions could only be defined to a limited extent.</p>	<p>... to product flexibility XJDF can also process multiple products in a single job, which makes complex online automation possible. Short-term or systematic changes (versioning, personalization, individualization and cross-media) can now be easily described. This also benefits postpress.</p>
<p>From JDF-XML ... Although JDF-XML was standard XML, it also used JDF-specific concepts. This meant that solution and interface developers were dependent on certain JDF tools. JDF implementation was therefore initially the responsibility of machine and software manufacturers. Everyone developed their "turnkey" solutions without thinking outside the box. Proprietary dialects were abundant.</p>	<p>... to standard XML XJDF uses only "well-formed" XML 1.0, and the absence of additional concepts allows the use of an XML Schema that ensures that the XML is recognized as "valid" by limiting proprietary data structures. Thus, XJDF is adapted to common developer tools and programming styles, which will facilitate implementation. When adopting JDF elements, XJDF elements maintain consistency, so that the numerous human- and machine-readable elements do not have to be invented a second time; however, backward compatibility to JDF is limited.</p>
<p>From a purpose-built tool ... JDF was primarily used to process orders, taking advantage of the local networking of production systems with the print shop MIS.</p>	<p>... to an extensible networking language XJDF extends its scope beyond production systems by using it to network companies (ERP) and online platforms (transmission of print jobs via the Internet, web store connection).</p>