



Automated Print Procurement ICS

Version 2.1

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1 Introduction

This Interoperability Conformance Specification (ICS) document standardizes business transactions between a *Print Buyer* and a *Print Provider*. In particular, this document defines a subset of the **XJDF** and **PrintTalk** specifications that has relevance for automated print procurement. The price negotiation workflow that is defined by the **RFQ** and **Quotation Business Objects** in **PrintTalk** is explicitly out of scope for this ICS.

This ICS document describes the workflow *Business Objects* required for submitting jobs from a *Print Buyer* to a *Print Provider* and mechanisms for the *Print Provider* to either accept or refuse the job and to provide the *Print Buyer* with job status information. Jobs can either be completely specified in detail for *Blind Exchange* or reference pre-negotiated product configurations by identifier that have been synchronized offline.

1.1 General Architecture

All transactions in an automated print procurement environment SHALL conform to **PrintTalk 2.0**. Each **PrintTalk** document SHALL contain a *Business Object*. Job descriptions SHALL be specified as **XJDF**.

1.1.1 Transport Protocol

Manager and *Worker* SHALL implement the bidirectional transport protocol according to ▶ [PrintTalk 2.1]. Implementation of the unidirectional transport protocol is outside of the scope of this ICS.

1.1.2 XML and ZIP Packaging

Conforming data SHALL be packaged either as a ZIP stream or as raw XML. Raw XML SHALL be accepted by conforming readers. ZIP packaging SHOULD be accepted by conforming readers. Conforming writers SHALL be capable of writing raw XML and SHOULD be capable of writing ZIP streams.

For details of ZIP and raw XML packaging, see ▶ [PrintTalk 2.1].

1.1.3 Availability of Referenced Assets

Referenced assets such as PDF files SHALL be available for download until a **Confirmation** or a **Refusal Business Object** has been received by the *Manager* or the deadline that was defined in **PurchaseOrder/@Expires** has been reached.

1.2 Security

Modified in ICS 2.1

All transactions SHALL use encryption technology for security and authentication. The use of unsecured transport is out of scope for this ICS. For details see ▶ [PrintTalk 2.1].

Modification note: Encryption technology was strongly encouraged (but not mandatory) prior to ICS 2.1.

1.3 Conventions Used in this Specification

Throughout this document a number of formatting and stylistic conventions have been employed that are intended to help the reader. These are intended to align with those of the **PrintTalk** and **XJDF** specification. See ▶ [PrintTalk 2.1] and ▶ [XJDF 2.1].

1.3.1 Document References

References to other publications are collated in ▶ Appendix A References. Within the text these references use a meaningful short symbolic name that may be clicked to allow the reader to navigate directly to the full description in the appendix. These references use a common text style as described in the following section.

1.3.2 Text Styles

There are a number of text styles that are used to identify the various components of the specification. Some of the text styles support dynamic links; these allow the reader to click on the term and navigate to the definition of the term (if it is locally defined).

- **PurchaseOrder** A **PrintTalk**, **XJDF** or **XJMF** element. Usually these are dynamic links leading to the definition of the element.
- **Process** A specific *Process* such as **ColorSpaceConversion** or **Rendering**. These can be dynamic links leading to the definition of the *Process*.

INTRODUCTION

- **@Attribute** A **PrintTalk**, **XJDF** or **XJMF** attribute within the context of an element.
- **"Value"** The content of an attribute.
- **PrintTalk** **PrintTalk**, **XJDF** or **XJMF** are used when referring to the specification in general rather than elements with the same name.
- *Glossary Item* The document utilizes some specialist terms; these are defined in ▶ Table 1.2 Glossary and highlighted throughout the document.
- ▶ [XJDF 2.1] Identifies a reference to an item within this specification (such as a particular table, section etc) or to an entry in the references appendix. These are dynamic links leading to the item itself.
- <http://www.CIP4.org> A hyperlink reference to an external item.

1.3.3 XPath Notation

- **PrintTalk/@Version** The document utilizes ▶ [XPath] notation when it is required to define the particular context for an item. It is particularly useful when there is a conditional term relating to the context, e.g., **Credential[@domain = "CustomerID"]** identifies the credentials of a customer.

1.3.4 Specification of Cardinality

The following table illustrates the notation of *Manager* and *Worker Conformance Requirements* in ICS tables.

If an attribute, attribute value or element is not provided explicitly or implicitly by a table row of <all other values>, it is assumed to be out of scope. An empty cell for a *Conformance Level* specifies that the *Trait* is out of scope for that *Conformance Level*. Out of scope values MAY be written and MAY be processed, but a conforming processor NEED NOT support them. The implied cardinality of out of scope values is therefore w? r?.

Table 1.1: Specification of cardinality

| NOTATION | NAME | DESCRIPTION |
|----------|-------------------|--|
| w | Write Required | When this cardinality indicator is applied to an attribute or element name, the <i>Trait</i> SHALL be written by the <i>Manager</i> or <i>Worker</i> . When this cardinality indicator is applied to an attribute value that is not a list type it specifies the only acceptable value. When this cardinality indicator is applied to an attribute value that is a list type, it specifies that the value SHALL be present in the list. |
| w? | Write Optional | The element, or attribute, or attribute value MAY be written by the <i>Manager</i> or <i>Worker</i> . When this cardinality indicator is applied to an attribute value that is a list type, it specifies that the value MAY be present in the list. |
| w← | Write Conditional | When this cardinality indicator is applied to an attribute or element name, the <i>Trait</i> SHALL be written by the <i>Manager</i> or <i>Worker</i> depending on conditions. The details of the condition will be specified in the description. When this cardinality indicator is applied to an attribute value that is not a list type, it specifies that the value is a valid selection from a list of acceptable values, one of which SHALL be present. When this cardinality indicator is applied to an attribute value that is a list type, it specifies that the value is a valid selection from a list of the values defined in this ICS that have a w←, one or more of which SHALL be present. |
| w! | Write Forbidden | The element, or attribute, or attribute value SHALL NOT be written by the <i>Manager</i> or <i>Worker</i> . When this cardinality indicator is applied to an attribute value that is a list type, it specifies that the value SHALL NOT be present in the list. |
| r | Read Required | The element, or attribute, or attribute value SHALL be read by the <i>Manager</i> or <i>Worker</i> . |
| r? | Read Optional | The element, or attribute, or attribute value MAY be read by the <i>Manager</i> or <i>Worker</i> . |
| r← | Read Conditional | The element, or attribute, or attribute value SHALL be read by the <i>Manager</i> or <i>Worker</i> depending on conditions. The details of the condition will be specified in the description. |

1.3.5 Conformance Terminology

This document uses exactly the same terminology as the **XJDF** specification to indicate the strictness of conformance. See ▶ [XJDF 2.1].

1.4 Changes from Version 2.0

This version of the Automated Print Production ICS has been revised to align it with the latest releases of ▶ [XJDF 2.1], ▶ [PrintTalk 2.1] and other **XJDF** 2.1 ICSs.

1.4.1 Additions

- ▶ Chapter 2 Conformance has been added with additional information on *Conformance Requirements* for products conforming to this ICS.
- Use of encryption technology is now required for all transactions. In previous releases, such technology was strongly encouraged but not mandated.
- ▶ Table 4.1 Business Object Types has been added to clarify the *Conformance Requirements* for the *Business Objects* included in this ICS. That table now makes clear that support for the **Confirmation**, **PurchaseOrder** and **Refusal Business Objects** is required by both *Managers* and *Workers*.

1.4.2 Removals

There are no significant removals.

1.4.3 Modifications

- The descriptions of the cardinality values described in ▶ Section 1.3.4 Specification of Cardinality have been significantly improved and clarified.
- Many conditionally-mandatory *Conformance Requirements* have been clarified, with many of them becoming optional.

1.5 Glossary

This section defines the terms and definitions that are required for automated print procurement. For general **XJDF** and **PrintTalk** terms please see ▶ [XJDF 2.1] and ▶ [PrintTalk 2.1] respectively.

Table 1.2: Glossary (Sheet 1 of 2)

| TERM | DEFINITION |
|--------------------------------|--|
| Blind Exchange | Defines a complete <i>Business Transaction</i> where no <i>Out of Band</i> synchronization of identifiers is required. |
| Business Object | See ▶ [PrintTalk 2.1]. |
| Business Transaction | See ▶ [PrintTalk 2.1]. |
| Conformance Level | Defines a subset of <i>Conformance Requirements</i> for an ICS. |
| Conformance Requirement | A single requirement that a conforming XJDF enabled product SHALL meet. An ICS specifies a set of <i>Conformance Requirements</i> that a conforming XJDF enabled product SHALL meet in order to achieve interoperability with other conforming XJDF enabled products that meet the same <i>Conformance Requirements</i> . |
| Manager | The software that implements the manager interface. The <i>Manager</i> software is used by the <i>Print Buyer</i> . |
| MIS | See ▶ [XJDF 2.1]. |
| Out Of Band | The exchange of metadata that is not conveyed using XJDF or PrintTalk . |
| Print Buyer | See ▶ [PrintTalk 2.1]. |
| Print Product | See ▶ [PrintTalk 2.1]. |
| Print Provider | See ▶ [PrintTalk 2.1]. |
| Process | See ▶ [XJDF 2.1]. |

Table 1.2: Glossary (Sheet 2 of 2)

| TERM | DEFINITION |
|---------------|---|
| Trait | In the context of an element, a single sub-element of it, a single attribute of it or a single value of one of its attributes. In the context of the specification, a table for an element contains all <i>Traits</i> of the element. |
| Worker | The software that receives XJDF instances, XJMF messages and other data from a <i>Manager</i> . The <i>Worker</i> SHOULD appropriately process the data and MAY send information back to a <i>Manager</i> . |

2 Conformance

New in ICS 2.1

2.1 Conformance Requirements

A product conforming to this ICS:

- SHALL produce or consume **PrintTalk** instances that conform to the ▶ [PrintTalk 2.1] specification.
- SHALL produce or consume **XJDF** instances that conform to the ▶ [XJDF 2.1] specification
- SHALL be able to read and write XML encoded in UTF-8 (variable number of octet Unicode characters).

2.2 Conformance Levels

This ICS specifies one *Conformance Level of Conformance Requirements*.

The *Conformance Level* is represented by a column. To be conformant to this ICS, a *Print Buyer* SHALL conform to the *Manager* part and a *Print Provider* SHALL conform to the *Worker* part of this ICS document.

Table 2.1: Conformance Levels

| LEVEL OF THIS ICS | DESCRIPTION |
|-------------------|--|
| 1 | <p>This ICS level includes support for:</p> <ul style="list-style-type: none"> • Submitting products that are completely specified in detail for <i>Blind Exchange</i> from a <i>Print Buyer</i> to a <i>Print Provider</i>. • Submitting pre-negotiated product configurations from a <i>Print Buyer</i> to a <i>Print Provider</i>. • Mechanisms for the <i>Print Provider</i> to either accept or refuse the job. • Mechanisms to provide job status information. |

2.3 Certification

CIP4 no longer provides certification for ICSs. Vendors are encouraged to certify their products by ensuring that all requirements laid out in the respective ICS are met. Additional hints for self certification are provided in the descriptions and are marked with the label "**Conformance Test:**".

In addition to self certification, vendors are encouraged to verify the interoperability of their products with other vendor's products that also comply with a given ICS and to publish the results in the CIP4 ▶ [Interoperability Matrix]. CIP4 regularly organizes interoperability testing events called "Interops". In addition to providing an informal venue where vendors and developers can test the interoperability of their products, active work groups meet to discuss the details of the next ICS documents and specifications.

2.4 Extensions and Deprecated Items

Elements, attributes or attribute values (including NMTOKEN values) that are neither defined in ▶ [PrintTalk 2.1] or ▶ [XJDF 2.1] or that are deprecated in ▶ [PrintTalk 2.1] or ▶ [XJDF 2.1] are optional to read or write (w?/r?). That is, write support for **XJDF** extensions and deprecated *Traits* is allowed.

Note: Interoperability based on such *Traits* might be reduced.

3 PrintTalk Requirements

This chapter describes the requirements of the **PrintTalk** *Business Objects* to support automated print procurement.

3.1 PrintTalk

The **PrintTalk** element SHALL be the root element of each *Business Transaction*.

Table 3.1: PrintTalk Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|-----------------------|----------|----------|--|
| <i>ICSVersions</i> | w r | r w | See ▶ [PrintTalk 2.1]. |
| Cus-APP_L1-2.1 | w r | r w | Specifies conformance to the Automated Print Procurement ICS <i>Conformance Level 1</i> . |
| <all other values> | w? r? | r? w? | @ <i>ICSVersions</i> MAY contain values specified in other ICS documents that require conformance to this ICS. |
| <i>timestamp</i> | w r? | r? w | The date and time the message was sent, in ▶ [ISO8601] format. @ <i>timestamp</i> SHOULD be provided with millisecond precision. @ <i>timestamp</i> SHALL NOT change for retry attempts. |
| Header | w r | r w | Header SHALL provide credentials of the parties that are involved. |
| Request | w r | r w | The Request element contains the body of the transaction as further specified in this document. |

3.2 Header

The **Header** element is a container element for information about the parties that are involved in the transaction.

Table 3.2: Header Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|---------------|---------|--------|--|
| From | w r | r w | From SHALL identify the original sender of the PrintTalk transaction. Note: This ICS assumes point to point interactions without 3rd party intermediaries. |
| Sender | w! | | Sender SHALL NOT be specified. |
| To | w r | r w | To SHALL be specified to identify the recipient of the PrintTalk transaction. |

3.3 From

This ICS assumes point to point transactions. Therefore **From** SHALL identify the single sender of the **PrintTalk** transaction.

Table 3.3: From Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|---|---------|---------|--|
| Credential [@domain="CustomerID"] | w | r | The customers identification string in the scope of the <i>Print Provider</i> . |
| Credential [@domain="ResponseURL"] Modified in ICS 2.1 | w? | r w! | If present, Credential [@domain="ResponseURL"] SHALL specify the target URL for all asynchronous <i>Business Transactions</i> from <i>Print Provider</i> to <i>Print Buyer</i> . Modification note: In ICS 2.1, the <i>Manager Conformance Requirement</i> changed from w<- to w?. |
| Credential [@domain="URL"] | w r | r w | The URL of the sender of the <i>Business Transaction</i> . The <i>Worker</i> SHALL provide a copy of the URL that received the initial request. |

3.4 To

Definition of the **To** element that SHALL be written.

Table 3.4: To Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|--------------------------------------|---------|--------|--|
| Credential [@domain="URL"] | r w | w r | The URL of the receiving <i>Manager</i> or <i>Worker</i> . |

3.5 Credential

Definition of the **Credential** that contains all credential details.

Table 3.5: Credential Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|-----------------|---------|--------|------------------------|
| <i>domain</i> | r w | w r | See ▶ [PrintTalk 2.1]. |
| <i>Identity</i> | r w | w r | See ▶ [PrintTalk 2.1]. |

3.6 Request

Modified in ICS 2.1

The **Request** element is a container element for the actual *Business Object*.

Modification Note: This table has been revised to clarify the requirements for *Business Objects*. *Conformance Requirements* for specific *Business Objects* have been moved to ▶ Table 4.1 Business Object Types, and replaced by <**Business Object**>.

Table 3.6: Request Element (Sheet 1 of 2)

| NAME | MANAGER | WORKER | DESCRIPTION |
|-------------------|---------|--------|---|
| <i>BusinessID</i> | w r | r w | @ <i>BusinessID</i> SHALL be specified with the unique identifier for this <i>Business Object</i> . |

Table 3.6: Request Element (Sheet 2 of 2)

| NAME | MANAGER | WORKER | DESCRIPTION |
|---|---------|---------|--|
| <i>BusinessRefID</i> | w← r | r w← | <p>@<i>BusinessRefID</i> SHALL NOT be present in a PurchaseOrder and SHALL be present in all other <i>Business Objects</i>.</p> <p>In the context of this ICS, the value of @<i>BusinessRefID</i> SHALL be the value of Request/<i>@BusinessID</i> of the initiating PurchaseOrder.</p> |
| < Business Object > Modified in ICS 2.1 | w r | r w | <p>See ▶ Section 4.1 Business Object Types for the <i>Conformance Requirements</i> of specific <i>Business Objects</i>.</p> <p>Modification note: This row replaces a number of rows that listed specific <i>Business Objects</i>; those rows have been moved to ▶ Table 4.1 Business Object Types.</p> |

4 Business Objects

Business Objects handle the *Business Transactions* between the two parties, the *Print Buyer* and the *Print Provider*.

4.1 Business Object Types

New in ICS 2.1

The following table specifies the *Conformance Requirements* for *Business Object* types that *Managers* and *Workers* SHALL support. The specific details of *Conformance Requirements* for each *Business Object* type is described later in this chapter. *Managers* and *Workers* MAY support other *Business Object* types; if so, they SHALL conform to the *Conformance Requirements* of those *Business Object* types.

Table 4.1: Business Object Types

| NAME | MANAGER | WORKER | DESCRIPTION |
|--|----------|----------|---|
| Confirmation Modified in ICS 2.1 | r | w | <p>Confirmation confirms the referred <i>Business Object</i>.</p> <p>In the context of the Automated Print Procurement ICS, the initiating <i>Business Object</i> PurchaseOrder SHALL be accepted with all its details specified. Confirmation SHALL NOT be sent prior to confirming that the job can be produced as requested and using the referenced print data.</p> <p>Note: This implies an implementation dependent preflight check.</p> <p>Conformance Test: The <i>Manager</i> SHALL mark the referenced PurchaseOrder as accepted when receiving a Confirmation.</p> <p>Modification note: The Conformance Test above was added in Automated Print Procurement 2.1.</p> |
| OrderStatusResponse | r? | w? | <p>An automatically generated OrderStatusResponse <i>Business Object</i> that describes the status of an order whose associated PurchaseOrder is referenced by the <code>@BusinessRefID</code>.</p> <p>OrderStatusResponse SHOULD be provided whenever a print job passes an <code>xjdf:Milestone</code>.</p> |
| PurchaseOrder | w | r | <p>The PurchaseOrder <i>Business Object</i> that contains all details about a single purchase order.</p> |
| Refusal Modified in ICS 2.1 | r | w | <p>A Refusal refuses a <i>Business Object</i>.</p> <p>In the context of the Automated Print Procurement ICS the Refusal <i>Business Object</i> refuses the referenced PurchaseOrder <i>Business Object</i>. This means that the automated job submission is NOT accepted.</p> <p>Conformance Test: The <i>Manager</i> SHALL mark the referenced PurchaseOrder as rejected when receiving a Refusal.</p> <p>Modification note: The Conformance Test above was added in Automated Print Procurement 2.1.</p> |
| <All other Business Objects> | w? r? | r? w? | <p>Other <i>Business Objects</i> may be provided but are out of scope for this ICS.</p> |

4.2 Confirmation

The **Confirmation** Business Object confirms the initiating **PurchaseOrder**, which is referenced by @*BusinessRefID*. The **Confirmation** Business Object SHOULD be an empty element.

A **Confirmation** Business Object SHALL NOT be sent prior to confirming that the job can be produced as requested and using the referenced print data.

Flow: *Print Provider to Print Buyer*

Table 4.2: Confirmation

| NAME | MANAGER | WORKER | DESCRIPTION |
|---------|---------|--------|-------------|
| <empty> | | | |

Example 4.1: Confirmation

The following example illustrates a **Confirmation** for the **PurchaseOrder** in ▶ Example 4.3: PurchaseOrder.

```
<PrintTalk ICSVersions="Cus-APP_L1-2.1"
  timestamp="2022-10-23T09:28:00.000+02:00" xmlns="http://www.printtalk.org/schema_20">
  <Header>
    <From>
      <Credential domain="URL">
        <Identity>https://worker.example.org/XJDF</Identity>
      </Credential>
    </From>
    <To>
      <Credential domain="URL">
        <Identity>https://manager.example.org/XJDF</Identity>
      </Credential>
    </To>
  </Header>
  <Request BusinessID="B-47" BusinessRefID="B-42">
    <Confirmation/>
  </Request>
</PrintTalk>
```

4.3 OrderStatusResponse

OrderStatusResponse Business Objects SHALL be sent to the *Print Buyer* whenever a condition as specified in a **PurchaseOrder/StatusRequest** is triggered.

Flow: *Print Provider to Print Buyer*

Table 4.3: OrderStatusResponse

| NAME | MANAGER | WORKER | DESCRIPTION |
|-----------------------|---------|--------|--|
| <i>xjdf:AuditPool</i> | r? | w | Milestones and delivery details are defined in this ICS. See ▶ [XJDF 2.1]. |

4.3.1 xjdf:AuditNotification

Table 4.4: xjdf:AuditNotification Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|--------------------------|---------|--------|---|
| <i>xjdf:Header</i> | r | w | See ▶ [XJDF 2.1]. |
| <i>xjdf:Notification</i> | r? | w | <i>xjdf:Notification</i> SHALL contain an <i>xjdf:Milestone</i> that describes the current status of the job. |

4.3.2 xjdf:AuditPool

xjdf:AuditPool is an **XJDF** element used by some **PrintTalk** Business Objects to allow for feedback from the *Print Provider*. For details see ▶ [XJDF 2.1] and ▶ [PrintTalk 2.1].

Table 4.5: *xjdf:AuditPool* Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|--|---------|--------|---|
| <i>xjdf:AuditNotification</i> Modified in ICS 2.1 | r | w? | <i>xjdf:AuditNotification</i> SHOULD be used to transfer milestones. All other usages of <i>xjdf:AuditNotification</i> are out of scope for this ICS. Modification note: In ICS 2.1, the <i>Worker Conformance Requirement</i> changed from w<- to w?. |
| <i>xjdf:AuditResource</i> Modified in ICS 2.1 | r | w? | <i>xjdf:AuditResource</i> SHOULD be used to transfer tracking IDs. All other usages of <i>xjdf:AuditResource</i> are out of scope for this ICS. Modification note: In ICS 2.1, the <i>Worker Conformance Requirement</i> changed from w<- to w?. |

4.3.3 *xjdf:AuditResource*

Table 4.6: *xjdf:AuditResource* Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|--------------------------|---------|--------|-------------------|
| <i>xjdf:Header</i> | r | w | See ▶ [XJDF 2.1]. |
| <i>xjdf:ResourceInfo</i> | r | w | See ▶ [XJDF 2.1]. |

4.3.4 *xjdf:Header*

Table 4.7: *xjdf:Header* Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|-----------------|---------|--------|-------------------|
| <i>DeviceID</i> | r | w | See ▶ [XJDF 2.1]. |
| <i>Time</i> | r | w | See ▶ [XJDF 2.1]. |

4.3.5 *xjdf:Milestone*

An *xjdf:Milestone* describes the overall status of a print job. The *Print Buyer* requirements for processing milestones only define the requirement to appropriately process a received milestone. This ICS does not define any requirements regarding the forwarding milestones, e.g. to an end customer.

Table 4.8: *xjdf:Milestone* Element (Sheet 1 of 2)

| NAME | MANAGER | WORKER | DESCRIPTION |
|---------------------------------|---------|--------|--|
| <i>MilestoneType</i> | r | w | See ▶ [XJDF 2.1]. |
| <i>JobCompletedSuccessfully</i> | r | w<- | @ <i>MilestoneType</i> = " <i>JobCompletedSuccessfully</i> " SHALL be specified by the <i>Print Provider</i> when the job has been completely produced. See ▶ [XJDF 2.1]. |
| <i>PostPressCompleted</i> | r | w? | @ <i>MilestoneType</i> = " <i>PostPressCompleted</i> " SHOULD be specified by the <i>Print Provider</i> when finishing of the job has been completed. See ▶ [XJDF 2.1]. |
| <i>PrePressCompleted</i> | r | w? | @ <i>MilestoneType</i> = " <i>PrePressCompleted</i> " SHOULD be specified by the <i>Print Provider</i> when prepress for the job has been completed. See ▶ [XJDF 2.1]. |

Table 4.8: *xjdf:Milestone Element (Sheet 2 of 2)*

| NAME | MANAGER | WORKER | DESCRIPTION |
|--------------------|---------|--------|--|
| PressCompleted | r | w? | @MilestoneType = "PressCompleted" SHOULD be specified by the <i>Print Provider</i> when the job has been printed. See ▶ [XJDF 2.1]. |
| <all other values> | r? | w? | Additional milestones MAY be specified but are out of scope of this ICS. |

4.3.6 xjdf:Notification

xjdf:Notification is a container for **xjdf:Milestone** elements. All other usages are out of scope for this ICS.

Table 4.9: *xjdf:Notification Element*

| NAME | MANAGER | WORKER | DESCRIPTION |
|-----------------------|---------|--------|--|
| Class | r? | w | See ▶ [XJDF 2.1]. |
| Event | r? | w | |
| JobID | r? | w | Identifier of the job that this xjdf:Notification applies to in the context of the <i>Print Buyer</i> . This SHALL be a copy of PurchaseOrder/xjdf:XJDF/@JobID . |
| xjdf:Milestone | r? | w | The milestone definition. |

4.3.7 xjdf:ResourceInfo

Table 4.10: *xjdf:ResourceInfo Element*

| NAME | MANAGER | WORKER | DESCRIPTION |
|--|---------|--------|---|
| xjdf:ResourceSet [@Name= "DeliveryParams"] Modified in ICS 2.1 | r? | w? | Container for an xjdf:DeliveryParams resource that in turn contains delivery details such as tracking IDs etc. Delivery details SHOULD be provided if the delivery is being done by a shipping provider. Modification note: In ICS 2.1, the <i>Worker Conformance Requirement</i> changed from w<- to w?. |
| xjdf:ResourceSet [@Name= <all other values>] | r? | w? | Additional resources MAY be specified but are out of scope for this ICS. |

Example 4.2: OrderStatusResponse

The following example illustrates an **OrderStatusResponse** that applies to the **PurchaseOrder** in ▶ Example 4.3: PurchaseOrder. It provides a milestone stating that the prepress work has been completed.

```
<PrintTalk ICSVersions="Cus-APP_L1-2.1"
timestamp="2022-10-23T09:28:00.000+02:00"
xmlns="http://www.printtalk.org/schema_20" xmlns:xjdf="http://www.CIP4.org/JDFSchema_2_0">
<Header>
  <From>
    <Credential domain="URL">
      <Identity>https://worker.example.org/XJDF</Identity>
    </Credential>
  </From>
  <To>
    <Credential domain="URL">
      <Identity>https://manager.example.org/XJDF</Identity>
    </Credential>
  </To>
</Header>
<Request BusinessID="B-49" BusinessRefID="B-42">
  <OrderStatusResponse JobIDRef="JOB-22">
    <xjdf:AuditPool>
      <xjdf:AuditNotification>
        <xjdf:Header DeviceID="Example-Worker-1" Time="2022-10-23T09:28:00.000+02:00"/>
        <xjdf:Notification Class="Event" JobID="B-52">
          <xjdf:Milestone MilestoneType="PrePressCompleted"/>
        </xjdf:Notification>
      </xjdf:AuditNotification>
    </xjdf:AuditPool>
  </OrderStatusResponse>
</Request>
</PrintTalk>
```

4.4 PurchaseOrder

A **PurchaseOrder** Business Object places a new order at the *Print Provider*.

Flow: *Print Buyer to Print Provider*

Table 4.11: PurchaseOrder

| NAME | MANAGER | WORKER | DESCRIPTION |
|-----------------------|---------|--------|---|
| <i>Expires</i> | w | r | @ <i>Expires</i> SHALL be specified with the date and time when this PurchaseOrder is no longer binding for the <i>Print Buyer</i> . The value of @ <i>Expires</i> SHALL be later than the value of PrintTalk / <i>@timestamp</i> and SHOULD be at least one hour after the time that this PurchaseOrder was sent. Note: An hour was chosen to allow sufficient time for automated preflighting of larger files. See ▶ [PrintTalk 2.1]. |
| MasterContract | w? | r | If a master contract has been negotiated, MasterContract SHOULD be provided by the <i>Print Buyer</i> . |
| Pricing | w? | r | If specified, Pricing SHALL specify the price of all final products and services. Pricing MAY be omitted in workflows with pre-negotiated contract prices. |
| StatusRequest | w? | r | See ▶ [PrintTalk 2.1]. |
| xjdf:XJDF | w | r | Description of each print job to be purchased. Each XJDF SHALL represent an individual product. Note: Multiple XJDF documents typically describe a shopping cart in a B2C environment or a batch of jobs in a B2B environment. |

4.4.1 MasterContract

Table 4.12: MasterContract Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|-------------------|---------|--------|---|
| <i>ContractID</i> | w | r | See ▶ [PrintTalk 2.1]. Note: Master contract identifiers are exchanged <i>Out of Band</i> . |

4.4.2 Pricing

The **Pricing** element SHALL contain a list of prices for all items.

Table 4.13: Pricing Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|---------------------|---------|--------|------------------------|
| <i>Currency</i> | w | r | See ▶ [PrintTalk 2.1]. |
| Price | w | r | See ▶ [PrintTalk 2.1]. |
| <i>xjdf:Contact</i> | w? | r | See ▶ [PrintTalk 2.1]. |

4.4.3 Price

The **Price** element specifies the price of a single item.

Table 4.14: Price Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|------------------------|---------|--------|--|
| <i>DescriptiveName</i> | w | r | The description of the price. |
| <i>LineID</i> | w | r | See ▶ [PrintTalk 2.1] for details of linking <i>@LineID</i> to products in XJDF . |
| <i>LineIDRefs</i> | w← | r | <i>@LineIDRefs</i> SHALL be specified if <i>@Price</i> of this Price element includes the value of <i>@Price</i> of other Price elements in this Pricing element, e.g., if <i>@PriceType</i> = "Total". See ▶ [PrintTalk 2.1] for details of how to use <i>@LineIDRefs</i> when calculating a sum of prices. |
| Price | w | r | See ▶ [PrintTalk 2.1]. |
| <i>PriceType</i> | w | r | See ▶ [PrintTalk 2.1]. |
| Product | w← | r | |
| Total | w← | r | |
| <all other values> | w? | r? | Other <i>@PriceType</i> values NEED NOT be included in the Price element but SHALL be included in calculations of sub-totals. |
| <i>TaxType</i> | w | r | This ICS has no business requirements regarding the inclusion or exclusion of taxes in Pricing . See ▶ [PrintTalk 2.1]. |
| Gross | w← | r | |
| Net | w← | r | |
| Tax | w← | r | |

4.4.4 StatusRequest

Table 4.15: StatusRequest Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|------------------------|---------|--------|--|
| <i>JobIDRef</i> | w! | | Only global status subscriptions are supported by this ICS. |
| <i>MilestoneAmount</i> | w← | r | Exactly one of @ <i>MilestoneAmount</i> or @ <i>ResourceAudit</i> SHALL be specified. See ▶ [PrintTalk 2.1]. |
| Brief | w | r | This ICS only supports subscriptions for individual milestones. See ▶ [PrintTalk 2.1]. |
| <i>ResourceAudit</i> | w← | r | Exactly one of @ <i>MilestoneAmount</i> or @ <i>ResourceAudit</i> SHALL be specified. See ▶ [PrintTalk 2.1]. |
| DeliveryParams | w← | r | @ <i>ResourceAudit</i> = "DeliveryParams" SHALL be specified for delivery tracking information. |
| <all other values> | w? | r? | Additional values MAY be specified but are out of the scope of this ICS. |

Example 4.3: PurchaseOrder

The following example illustrates a **PurchaseOrder** for 1000 A6 leaflets printed in CMYK on 90 gsm paper. It includes the charged price and delivery details.

```
<PrintTalk ICSVersions="Cus-APP_L1-2.1"
timestamp="2022-10-23T09:28:00.000+02:00"
xmlns="http://www.printtalk.org/schema_20" xmlns:xjdf="http://www.CIP4.org/JDFSchema_2_0">
<Header>
  <From>
    <Credential domain="CustomerID">
      <Identity>CID-123</Identity>
    </Credential>
    <Credential domain="URL">
      <Identity>https://manager.example.org/XJDF</Identity>
    </Credential>
  </From>
  <To>
    <Credential domain="URL">
      <Identity>https://worker.example.org/XJDF</Identity>
    </Credential>
  </To>
</Header>
<Request BusinessID="B-42">
  <PurchaseOrder Expires="2022-10-24T10:00:00.000+02:00">
    <Pricing Currency="EUR">
      <Price DescriptiveName="1000 Flyer DIN A6" LineID="L-1"
        Price="100.00" PriceType="Product" TaxType="Net"/>
      <Price DescriptiveName="Tax 19 %" LineID="L-2" Price="19.00"
        PriceType="Product" TaxType="Tax"/>
      <Price DescriptiveName="Total Price" LineID="L-3"
        LineIDRefs="L-1 L-2" Price="119.00" PriceType="Total" TaxType="Gross"/>
    </Pricing>
    <xjdf:XJDF JobID="JOB-22" Types="Product">
      <xjdf:ProductList>
        <xjdf:Product Amount="1000">
          <xjdf:GeneralID IDUsage="LineID" IDValue="L-1"/>
          <xjdf:Intent Name="ColorIntent">
            <xjdf:ColorIntent>
              <xjdf:SurfaceColor
                ColorsUsed="Cyan Magenta Yellow Black"
                PrintStandard="FOGRA51" Surface="Front"/>
              <xjdf:SurfaceColor
                ColorsUsed="Cyan Magenta Yellow Black"
                PrintStandard="FOGRA51" Surface="Back"/>
            </xjdf:ColorIntent>
          </xjdf:Intent>
          <xjdf:Intent Name="LayoutIntent">
            <xjdf:LayoutIntent FinishedDimensions="297.64 419.53 0"
```

```

    Pages="2" Sides="TwoSidedHeadToHead" SpreadType="SinglePage"/>
  </xjdf:Intent>
  <xjdf:Intent Name="MediaIntent">
    <xjdf:MediaIntent Coating="None" MediaType="Paper" Weight="90"/>
  </xjdf:Intent>
</xjdf:Product>
</xjdf:ProductList>
<xjdf:ResourceSet Name="Contact" Usage="Input">
  <xjdf:Resource>
    <xjdf:Part ContactType="Delivery"/>
    <xjdf:Contact>
      <xjdf:Address City="ExampleCity" Country="Germany"
        CountryCode="DE" PostalCode="12345"
        Region="North Rhine-Westphalia" Street="ExampleStreet 1"/>
      <xjdf:Company OrganizationName="Example Company Ltd."/>
    </xjdf:Contact>
  </xjdf:Resource>
  <xjdf:Resource>
    <xjdf:Part ContactType="SenderAlias"/>
    <xjdf:Contact>
      <xjdf:Address City="PrinterCity" Country="Germany"
        CountryCode="DE" PostalCode="54321" Street="Printerstreet 1"/>
      <xjdf:Company OrganizationName="ACME Printing"/>
    </xjdf:Contact>
  </xjdf:Resource>
</xjdf:ResourceSet>
<xjdf:ResourceSet Name="DeliveryParams" Usage="Input">
  <xjdf:Resource>
    <xjdf:DeliveryParams Method="StandardShipping" Required="2022-10-28T16:00:00.000+02:00"/>
  </xjdf:Resource>
</xjdf:ResourceSet>
<xjdf:ResourceSet Name="NodeInfo" Usage="Input">
  <xjdf:Resource>
    <xjdf:NodeInfo NaturalLang="German"/>
  </xjdf:Resource>
</xjdf:ResourceSet>
<xjdf:ResourceSet Name="RunList" Usage="Input">
  <xjdf:Resource>
    <xjdf:RunList>
      <xjdf:FileSpec MimeType="application/pdf" URL="http://example.org/artwork.pdf"/>
    </xjdf:RunList>
  </xjdf:Resource>
</xjdf:ResourceSet>
</xjdf:XJDF>
</PurchaseOrder>
</Request>
</PrintTalk>

```

4.5 Refusal

The **Refusal** Business Object refuses the initiating **PurchaseOrder**, which is referenced by **@BusinessRefID**.

Flow: **Print Provider to Print Buyer**

Table 4.16: Refusal

| NAME | MANAGER | WORKER | DESCRIPTION |
|----------------------|---------|--------|--|
| <i>Reason</i> | r? | w | @ <i>Reason</i> SHALL be specified. See ▶ [PrintTalk 2.1] for a list of valid values. |
| <i>ReasonDetails</i> | r? | w? | @ <i>ReasonDetails</i> SHOULD be supplied and SHOULD be selected from the predefined list of refusal codes defined in ▶ [PrintTalk 2.1]. |

Example 4.4: Refusal

The following example illustrates a **Refusal** for the **PurchaseOrder** in ▶ Example 4.3: PurchaseOrder because the provided price is unacceptable.

```
<PrintTalk ICSVersions="Cus-APP_L1-2.1"
timestamp="2022-10-23T09:28:00.000+02:00" xmlns="http://www.printtalk.org/schema_20">
  <Header>
    <From>
      <Credential domain="URL">
        <Identity>https://worker.example.org/XJDF</Identity>
      </Credential>
    </From>
    <To>
      <Credential domain="URL">
        <Identity>https://manager.example.org/XJDF</Identity>
      </Credential>
    </To>
  </Header>
  <Request BusinessID="B-43" BusinessRefID="B-42">
    <Refusal Reason="InvalidPrice" ReasonDetails="WrongPrice"/>
  </Request>
</PrintTalk>
```

5 XJDF Product Description

Product description allows the *Manager* to specify the requirements for the final product without having to specify any *Processes*.

If a *Print Provider* is not capable of producing or procuring the end product as described, it SHALL NOT accept the order.

5.1 xjdf:XJDF

Table 5.1: xjdf:XJDF Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|---|---------|--------|--|
| <i>JobID</i> | w | r | Job identification in the context of the <i>Print Buyer</i> . Note: <i>@JobID</i> will typically not be used as the internal job identifier by the <i>Print Provider</i> . |
| <i>Types</i> | w | r | See ▶ [XJDF 2.1]. |
| Product | w | r | The XJDF shall contain a product description. |
| <all other values> | w? | r? | Additional <i>Processes</i> MAY be specified in addition to " Product " but are out of scope for this ICS. Note: If additional values are specified then " Product " SHOULD be the first value in the list. |
| <i>xjdf:ProductList</i> | w | r | <i>xjdf:ProductList</i> SHALL specify a list of products and product parts from the <i>Print Buyer</i> 's point of view. |
| <i>xjdf:ResourceSet</i> [<i>@Name</i> ="Contact"] | w | r | Container for <i>xjdf:Contact</i> resources that contain details such as delivery address, sender's address or customer details. |
| <i>xjdf:ResourceSet</i> [<i>@Name</i> ="DeliveryParams"] Modified in ICS 2.1 | w? | r | Container for <i>xjdf:DeliveryParams</i> resources that contain delivery details including split deliveries and shipping details. Modification note: In ICS 2.1, the <i>Manager Conformance Requirement</i> changed from w<- to w?. |
| <i>xjdf:ResourceSet</i> [<i>@Name</i> ="NodeInfo"] | w | r | Container for an <i>xjdf:NodeInfo</i> resource that contains scheduling details. |
| <i>xjdf:ResourceSet</i> [<i>@Name</i> ="RunList"] | w | r | Container for <i>xjdf:RunList</i> resources that contain details about the customer's artwork. |
| <i>xjdf:ResourceSet</i> [<i>@Name</i> ="<all other values>"] | w? | r? | Additional resources MAY be specified but are out of scope for this ICS. |

5.2 xjdf:ProductList

The *xjdf:ProductList* element is a container for one or multiple *xjdf:Product* elements. Each *xjdf:Product* element represents either a product (self-containing product) or a product part (multi-part product).

Examples for self-containing products are simple flyers, folded leaflets or even single component brochures. A sample for a multi-part product is a brochure with an extra cover (i. e. stronger paper or different color or finishing configuration).

Table 5.2: *xjdf:ProductList* Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|---------------------|---------|--------|--|
| <i>xjdf:Product</i> | w | r | <i>xjdf:ProductList</i> SHALL contain exactly one root product (<i>xjdf:Product</i> / <i>@IsRoot="true"</i>). Partial products (<i>xjdf:Product</i> / <i>@IsRoot="false"</i>) such as cover and body MAY be provided. Note: This ICS describes individual end products. Multiple root products, which are only required for gang jobs in production, are out of the scope of this ICS. |

5.3 *xjdf:Product*

xjdf:Product specifies an individual product or product part.

Note: If *@ExternalID* is provided, *Out Of Band* product synchronization is required, where a specific product configuration has been bound to a unique identifier thus preventing a *Blind Exchange*.

Table 5.3: *xjdf:Product* Element (Sheet 1 of 2)

| NAME | MANAGER | WORKER | DESCRIPTION |
|---|---------|--------|--|
| <i>Amount</i> | w← | r | If <i>@IsRoot="true"</i> , this attribute SHALL define the total number of final products needed. When specifying a product part with <i>@IsRoot="false"</i> , the attribute <i>@Amount</i> SHALL define how many items are required in order to produce a single final product. If not specified, the product part is assumed to be required once per final product. |
| <i>ExternalID</i> | w? | r | If present, <i>@ExternalID</i> SHALL identify a product type. Note: The presence of this attribute prohibits <i>Blind Exchange</i> . See ▶ [XJDF 2.1]. |
| <i>IsRoot</i> | w | r | If <i>@IsRoot="true"</i> , this <i>xjdf:Product</i> element describes either a self-contained product or describes the root product part of a multi-part product description. If <i>@IsRoot="false"</i> , this <i>xjdf:Product</i> element is a product part of another <i>xjdf:Product</i> , such as a cover or body of a brochure. |
| <i>xjdf:GeneralID</i> [<i>@IDUsage="LineID"</i>] | w← | r | <i>xjdf:GeneralID</i> / <i>@IDValue</i> SHALL reference the <i>Pricing/Price</i> / <i>@LineID</i> of the pricing element that describes the price of this <i>Print Product</i> . This element SHALL be written in case <i>@IsRoot="true"</i> and <i>Pricing</i> is provided. |
| <i>xjdf:Intent</i> [<i>@Name="BindingIntent"</i>] | w? | r | <i>xjdf:BindingIntent</i> specifies the binding of a product. In case of a multi-part product description, this intent SHALL reference the product parts (<i>@IsRoot="false"</i>). |
| <i>xjdf:Intent</i> [<i>@Name="ColorIntent"</i>] | w← | r | <i>xjdf:ColorIntent</i> specifies the color and varnishing of the product. <i>xjdf:Intent</i> [<i>@Name="ColorIntent"</i>] SHALL be specified if <i>xjdf:Product</i> / <i>@ExternalID</i> is not present. |
| <i>xjdf:Intent</i> [<i>@Name="FoldingIntent"</i>] | w? | r | <i>xjdf:FoldingIntent</i> specifies the straight line folding, creasing and perforating of a product. |
| <i>xjdf:Intent</i> [<i>@Name="LayoutIntent"</i>] | w← | r | <i>xjdf:LayoutIntent</i> specifies the size and orientation of the finished pages. <i>xjdf:Intent</i> [<i>@Name="LayoutIntent"</i>] SHALL be specified if <i>xjdf:Product</i> / <i>@ExternalID</i> is not present. |

Table 5.3: *xjdf:Product* Element (Sheet 2 of 2)

| NAME | MANAGER | WORKER | DESCRIPTION |
|---|---------|--------|--|
| <i>xjdf:Intent</i> [@Name="MediaIntent"] | w← | r | <i>xjdf:MediaIntent</i> describes the printing substrate to be used for the product. <i>xjdf:Intent</i> [@Name="MediaIntent"] SHALL be specified if <i>xjdf:Product</i> /@ExternalID is not present. |
| <i>xjdf:Intent</i> [@Name=<all other values>] | w? | r | All further intents are optional for the <i>Manager</i> . The <i>Worker</i> SHALL at least detect that a specific intent is not supported. Note: Detecting unsupported intents will typically cause an order refusal. |

5.3.1 *xjdf:GeneralID*

In the context of the **Automated Print Procurement ICS** this element is used to reference the pricing in a product definition.

Table 5.4: *xjdf:GeneralID* Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|--------------------|---------|--------|--|
| <i>IDUsage</i> | w | r | See ▶ [XJDF 2.1]. |
| <i>LineID</i> | w← | r | @ <i>IDUsage</i> = " <i>LineID</i> " specifies the unique identifier for the line item that a <i>Price</i> represents. |
| <all other values> | w? | r? | Other values MAY be used but are out of scope of this ICS. |
| <i>IDValue</i> | w | r | See ▶ [XJDF 2.1]. |

6 XJDF Intent Descriptions

Specific details of products or product parts that are specified in *xjdf:Intent* elements.

6.1 *xjdf:BindingIntent*

BindingIntent specifies the binding intent for a product.

6.1.1 *xjdf:Intent*

Table 6.1: *xjdf:BindingIntent xjdf:Intent Element*

| NAME | MANAGER | WORKER | DESCRIPTION |
|---------------------------|---------|--------|------------------------------|
| <i>Name</i> | w | r | See ▶ [XJDF 2.1]. |
| <i>BindingIntent</i> | w | r | |
| <i>xjdf:BindingIntent</i> | w | r | The specific binding intent. |

6.1.2 *xjdf:BindingIntent*

Table 6.2: *xjdf:BindingIntent Element*

| NAME | MANAGER | WORKER | DESCRIPTION |
|---|---------|--------|--|
| <i>BindingOrder</i> | w | r | See ▶ [XJDF 2.1]. |
| <i>BindingSide</i> | w | r | See ▶ [XJDF 2.1]. |
| <i>BindingType</i> | w | r | See ▶ [XJDF 2.1]. |
| <i>ChildRefs</i> Modified in ICS 2.1 | w? | r | See ▶ [XJDF 2.1]. Modification note: In ICS 2.1, the <i>Manager Conformance Requirement</i> changed from w<- to w?. |

6.2 *xjdf:ColorIntent*

xjdf:ColorIntent specifies the color and varnishing intent for a product. Each surface SHALL be specified individually in an *xjdf:SurfaceColor* element. Single sided printing SHALL be specified by providing exactly one *xjdf:SurfaceColor* element. In addition to the printed images, *xjdf:ColorIntent* also provides details of protective or gloss enhancing coatings.

Note: In case a more precise color definition is needed, please check the **Quality Control ICS**.

6.2.1 *xjdf:Intent*

Table 6.3: *xjdf:ColorIntent xjdf:Intent Element*

| NAME | MANAGER | WORKER | DESCRIPTION |
|-------------------------|---------|--------|----------------------------|
| <i>Name</i> | w | r | See ▶ [XJDF 2.1]. |
| <i>ColorIntent</i> | w | r | |
| <i>xjdf:ColorIntent</i> | w | r | The specific color intent. |

6.2.2 xjdf:ColorIntent

Table 6.4: xjdf:ColorIntent Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|-----------------------------------|---------|--------|---|
| xjdf:SurfaceColor | w | r | See ▶ [XJDF 2.1]. Note: See also xjdf:LayoutIntent/@Sides for rules on imposing pages on front and back surfaces. |

6.2.2.1 xjdf:SurfaceColor

This element specifies the color configuration of the desired product's surface.

Table 6.5: xjdf:SurfaceColor Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|-------------------------------|---------|--------|-------------------|
| Coatings | w? | r | See ▶ [XJDF 2.1]. |
| ColorsUsed | w? | r | See ▶ [XJDF 2.1]. |
| PrintStandard | w? | r | See ▶ [XJDF 2.1]. |
| Surface | w | r | See ▶ [XJDF 2.1]. |

6.3 xjdf:FoldingIntent

[xjdf:FoldingIntent](#) specifies the straight line folding of a product.

Note: [xjdf:FoldingIntent](#) specifies the folding intent for a product excluding folds that are implied by binding. See [xjdf:BindingIntent](#) for additional details.

6.3.1 xjdf:Intent

Table 6.6: xjdf:FoldingIntent xjdf:Intent Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|------------------------------------|---------|--------|------------------------------|
| Name | w | r | See ▶ [XJDF 2.1]. |
| FoldingIntent | w | r | |
| xjdf:FoldingIntent | w | r | The specific folding intent. |

6.3.2 xjdf:FoldingIntent

Table 6.7: xjdf:FoldingIntent Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|-----------------------------|---------|--------|-------------------|
| FoldCatalog | w | r | See ▶ [XJDF 2.1]. |
| Orientation | w | r | See ▶ [XJDF 2.1]. |

6.4 xjdf:LayoutIntent

[xjdf:LayoutIntent](#) specifies the size of the final product as well as how the artwork is delivered. The positioning of the artwork pages on the final product is also defined in [xjdf:LayoutIntent](#).

6.4.1 xjdf:Intent

Table 6.8: xjdf:LayoutIntent xjdf:Intent Element (Sheet 1 of 2)

| NAME | MANAGER | WORKER | DESCRIPTION |
|----------------------|---------|--------|-------------------|
| Name | w | r | See ▶ [XJDF 2.1]. |

Table 6.8: *xjdf:LayoutIntent* *xjdf:Intent* Element (Sheet 2 of 2)

| NAME | MANAGER | WORKER | DESCRIPTION |
|--------------------------|---------|--------|-----------------------------|
| LayoutIntent | w | r | |
| <i>xjdf:LayoutIntent</i> | w | r | The specific layout intent. |

6.4.2 *xjdf:LayoutIntent*

Table 6.9: *xjdf:LayoutIntent* Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|---------------------------|---------|--------|--|
| <i>Dimensions</i> | w← | r | <i>@Dimensions</i> SHALL be specified for products with a varying page size such as a wrap-around cover with a spine. Exactly one of <i>@Dimensions</i> and <i>@FinishedDimensions</i> SHALL be specified. Note: This is commonly known as the open product size. See ▶ [XJDF 2.1]. |
| <i>FinishedDimensions</i> | w← | r | <i>@FinishedDimensions</i> SHALL be specified for products where all pages have the same size. Exactly one of <i>@Dimensions</i> and <i>@FinishedDimensions</i> SHALL be specified. Note: This is commonly known as the closed product size. See ▶ [XJDF 2.1]. |
| <i>Pages</i> | w | r | See ▶ [XJDF 2.1]. |
| <i>Sides</i> | w | r | See ▶ [XJDF 2.1]. |
| <i>SpreadType</i> | w | r | See ▶ [XJDF 2.1]. |

6.5 *xjdf:MediaIntent*

xjdf:MediaIntent describes the substrate that SHALL be used for the product or product part.

Note: If *@MediaQuality* is provided, *Out Of Band* media synchronization is required, where a specific media has been bound to a unique identifier thus preventing a *Blind Exchange*.

6.5.1 *xjdf:Intent*

Table 6.10: *xjdf:MediaIntent* *xjdf:Intent* Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|-------------------------|---------|--------|----------------------------|
| <i>Name</i> | w | r | See ▶ [XJDF 2.1]. |
| MediaIntent | w | r | |
| <i>xjdf:MediaIntent</i> | w | r | The specific media intent. |

6.5.2 *xjdf:MediaIntent*

Table 6.11: *xjdf:MediaIntent* Element (Sheet 1 of 2)

| NAME | MANAGER | WORKER | DESCRIPTION |
|--------------------------|---------|--------|---|
| <i>Brand</i> | w? | r | See ▶ [XJDF 2.1]. |
| <i>Coating</i> | w← | r | <i>@Coating</i> SHALL be specified if <i>@MediaQuality</i> is not present. See ▶ [XJDF 2.1]. |
| <i>ISOPaperSubstrate</i> | w? | r | <i>@ISOPaperSubstrate</i> SHALL specify the type of paper material defined in accordance with the print substrate, see ▶ [ISO12647-2:2013]. |

Table 6.11: *xjdf:MediaIntent* Element (Sheet 2 of 2)

| NAME | MANAGER | WORKER | DESCRIPTION |
|---|---------|--------|--|
| <i>MediaQuality</i> | w← | r | @ <i>MediaQuality</i> SHALL be specified if either of @ <i>Coating</i> or @ <i>Weight</i> is NOT specified. If @ <i>MediaQuality</i> is present, additional details of the media SHOULD NOT be present. See ▶ [XJDF 2.1]. |
| <i>MediaType</i> | w | r | See ▶ [XJDF 2.1]. |
| Paper | w← | r | In most cases the value of @ <i>MediaType</i> will be "Paper". |
| <all other values> Modified in ICS 2.1 | w? | r? | Additional media types MAY be specified but are out of scope for this ICS. Modification note: In ICS 2.1, the <i>Worker Conformance Requirement</i> changed from r to r?. |
| <i>Weight</i> | w← | r | @ <i>Weight</i> SHALL be specified if @ <i>MediaQuality</i> is not present. See ▶ [XJDF 2.1]. |
| <i>xjdf:Certification</i> | w? | r | <i>xjdf:Certification</i> SHALL specify a minimum requested paper certification level. Not more than one <i>xjdf:Certification</i> SHALL be specified. |

6.5.2.1 *xjdf:Certification*

Certification specifies the certification properties of the paper.

Table 6.12: *xjdf:Certification* Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|---------------------|---------|--------|-------------------|
| <i>Organization</i> | w | r | See ▶ [XJDF 2.1]. |

7 XJDF Resources

The term resources refers to all the production related metadata of a job that is needed to fulfill that job.

7.1 xjdf:Contact

Contacts are used to define various types of contact details.

The **xjdf:Contact** resource SHALL be partitioned according to the partition key @ContactType.

7.1.1 xjdf:ResourceSet

Table 7.1: xjdf:Contact xjdf:ResourceSet Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|---------------|---------|--------|---|
| Name | w | r | See ▶ [XJDF 2.1]. |
| Contact | w | r | |
| Usage | w | r | See ▶ [XJDF 2.1]. |
| Input | w | r | |
| xjdf:Resource | w | r | One xjdf:Resource element SHALL be specified for each contact. |

7.1.2 xjdf:Resource

Table 7.2: xjdf:Contact xjdf:Resource Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|--------------|---------|--------|--|
| xjdf:Part | w | r | The contact type SHALL be specified in one or more xjdf:Part elements. An individual xjdf:Contact that fulfills multiple roles SHOULD be specified as a single resource with multiple xjdf:Part elements. |
| xjdf:Contact | w | r | The specific xjdf:Contact element. |

7.1.3 xjdf:Part

Table 7.3: xjdf:Contact xjdf:Part Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|--------------------|---------|--------|--|
| ContactType | w | r | @ContactType SHALL be specified for xjdf:Contact . |
| Delivery | w← | r | One delivery xjdf:Contact SHALL be specified for each delivery address. |
| SenderAlias | w? | r | Definition of the <i>Print Buyers's</i> customer facing address. |
| <all other values> | w? | r? | Additional values MAY be specified but are out of scope of this ICS. |
| DropID | w← | r | If more than one delivery address or delivery date is specified, then @DropID SHALL also be specified. |

7.1.4 xjdf:Contact

Table 7.4: xjdf:Contact Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|------------------------------|---------|--------|--|
| xjdf:Address | w | r | See ▶ [XJDF 2.1]. |
| xjdf:Company | w← | r | Company that this xjdf:Contact is associated with. At least one of xjdf:Company or xjdf:Person SHALL be specified. |
| xjdf:Person | w← | r | Name of the contact person. At least one of xjdf:Company or xjdf:Person SHALL be specified. |

7.1.4.1 xjdf:Address

[xjdf:Address](#) SHALL specify those attributes necessary for a given address; the precise combination of attributes will depend on the address type and nationality, i.e., localization.

Table 7.5: xjdf:Address Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|---------------------------------|---------|--------|-------------------|
| City | w← | r← | See ▶ [XJDF 2.1]. |
| CivicNumber | w← | r← | See ▶ [XJDF 2.1]. |
| Country | w← | r← | See ▶ [XJDF 2.1]. |
| CountryCode | w← | r← | See ▶ [XJDF 2.1]. |
| ExtendedAddress | w← | r← | See ▶ [XJDF 2.1]. |
| PostalCode | w← | r← | See ▶ [XJDF 2.1]. |
| PostBox | w← | r← | See ▶ [XJDF 2.1]. |
| Region | w← | r← | See ▶ [XJDF 2.1]. |
| Street | w← | r← | See ▶ [XJDF 2.1]. |

7.1.4.2 xjdf:Company

Table 7.6: xjdf:Company Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|----------------------------------|---------|--------|-------------------|
| OrganizationName | w | r | See ▶ [XJDF 2.1]. |

7.1.4.3 xjdf:Person

Table 7.7: xjdf:Person Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|--|---------|--------|--|
| AdditionalNames | w? | r | See ▶ [XJDF 2.1]. |
| FamilyName | w | r | See ▶ [XJDF 2.1]. |
| FirstName Modified in ICS 2.1 | w? | r | @ FirstName SHOULD be specified if known. Modification note: In ICS 2.1, the <i>Manager Conformance Requirement</i> changed from w←- to w? and the sentence just above was added. |
| NamePrefix | w? | r | See ▶ [XJDF 2.1]. |

7.2 xjdf:DeliveryParams

xjdf:DeliveryParams are used to define details of shipping. If *xjdf:DeliveryParams* is specified in the context of a *PurchaseOrder*, it defines the *Print Buyer's* requested delivery details. If *xjdf:DeliveryParams* is specified in the context of an *OrderStatusResponse*, it defines the actual delivery details that the *Print Provider* has arranged.

7.2.1 xjdf:ResourceSet

Table 7.8: *xjdf:DeliveryParams xjdf:ResourceSet Element*

| NAME | MANAGER | WORKER | DESCRIPTION |
|-----------------------|---------|--------|--|
| <i>Name</i> | w r | r w | See ▶ [XJDF 2.1]. |
| <i>DeliveryParams</i> | w r | r w | |
| <i>Usage</i> | w r | r w | See ▶ [XJDF 2.1]. |
| <i>Input</i> | w r | r w | |
| <i>xjdf:Resource</i> | w r | r w | One <i>xjdf:Resource</i> element SHALL be specified for each delivery. |

7.2.2 xjdf:Resource

Table 7.9: *xjdf:DeliveryParams xjdf:Resource Element*

| NAME | MANAGER | WORKER | DESCRIPTION |
|-------------------------------------|----------|---------|---|
| <i>Brand</i> Modified in ICS 2.1 | w? r? | r w← | @ <i>Brand</i> SHALL specify the brand of the requested carrier that provides delivery services. The <i>Print Provider</i> SHALL specify @ <i>Brand</i> if <i>xjdf:DeliveryParams/@TrackingID</i> is present. Modification note: In ICS 2.1, the statement above regarding <i>Print Provider</i> support was changed from 'SHOULD' to 'SHALL'. |
| <i>xjdf:Part</i> | w← r | r w← | <i>xjdf:Part</i> SHALL be specified if multiple <i>xjdf:ResourceSet/xjdf:Resource</i> elements are specified. |
| <i>xjdf:DeliveryParams</i> | w r | r w | See ▶ [XJDF 2.1]. |

7.2.3 xjdf:Part

Table 7.10: *xjdf:DeliveryParams xjdf:Part Element*

| NAME | MANAGER | WORKER | DESCRIPTION |
|--------------------|---------|--------|--|
| <i>DropID</i> | w r | r w | See ▶ [XJDF 2.1]. |
| <all other values> | w! | w! | Other partition keys SHALL NOT be specified. |

7.2.4 xjdf:DeliveryParams

Table 7.11: xjdf:DeliveryParams Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|-------------------------|----------|----------|---|
| <i>Method</i> | w? r? | r w? | Delivery method that is desired by the <i>Print Buyer</i> or has been selected by the <i>Print Producer</i> . |
| StandardShipping | w← r? | r w← | Delivery according to the standard terms of service of the carrier, optimized by price. |
| ExpressShipping | w← r? | r w← | Guaranteed delivery, faster than " StandardShipping ", optimized by time. |
| <all other values> | w? r? | r? w? | Other methods of delivery MAY be specified but are out of scope of this ICS. |
| <i>Required</i> | w← | r | The date and time by which the delivery is intended to be made (commonly known as the customer's delivery date). Exactly one of <i>xjdf:DeliveryParams/@Required</i> or <i>xjdf:NodeInfo/@End</i> SHALL be provided by the <i>Manager</i> . |
| <i>TrackingID</i> | w? r? | r? w← | The carrier's identifier for the delivery. The format of <i>@TrackingID</i> is determined by the carrier chosen to ship the product(s). The <i>Worker</i> SHALL provide <i>@TrackingID</i> as early as possible if available. |

7.3 xjdf:NodeInfo

xjdf:NodeInfo elements are used to define details about planned scheduling.

7.3.1 xjdf:ResourceSet

Table 7.12: xjdf:NodeInfo xjdf:ResourceSet Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|----------------------|---------|--------|--|
| <i>Name</i> | w | r | See ▶ [XJDF 2.1]. |
| NodeInfo | w | r | |
| <i>Usage</i> | w | r | See ▶ [XJDF 2.1]. |
| Input | w | r | |
| <i>xjdf:Resource</i> | w | r | Scheduling details such as the planned production date of the product. |

7.3.2 xjdf:Resource

Table 7.13: xjdf:NodeInfo xjdf:Resource Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|----------------------|---------|--------|-------------------|
| <i>xjdf:NodeInfo</i> | w | r | See ▶ [XJDF 2.1]. |

7.3.3 xjdf:NodeInfo

Table 7.14: xjdf:NodeInfo Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|---|---------|--------|--|
| <i>End</i> | w← | r | Date and time at which the product is scheduled to be completely manufactured. Exactly one of xjdf:DeliveryParams/@Required or xjdf:NodeInfo/@End SHALL be provided by the <i>Manager</i> . Note: This date excludes shipping times. |
| <i>FirstStart</i> | w! | | If initial start times are requested, use @Start . |
| <i>LastEnd</i> | w! | | If final end times are requested, use @End . |
| <i>NaturalLang</i> Modified in ICS 2.1 | w? | r | If systems are multilingual, @NaturalLang SHOULD be specified. Modification note: In ICS 2.1, the <i>Manager Conformance Requirement</i> changed from w← to w?. |
| <i>Start</i> | w? | r? | Note: Detailed production scheduling is out of scope for this ICS. See ▶ [XJDF 2.1]. |

7.4 xjdf:RunList

[xjdf:RunList](#) is used to reference binary data such as the customer's artwork file. In the context of the **Automated Print Procurement ICS** it references the customer's artwork.

7.4.1 xjdf:ResourceSet

Table 7.15: xjdf:RunList xjdf:ResourceSet Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|-------------------------------|---------|--------|--|
| <i>Name</i> | w | r | See ▶ [XJDF 2.1]. |
| <i>RunList</i> | w | r | |
| <i>Usage</i> | w | r | See ▶ [XJDF 2.1]. |
| <i>Input</i> | w | r | |
| xjdf:Resource | w | r | Not more than one xjdf:RunList SHALL be provided for each xjdf:Product . The pages SHALL be ordered in reader order within the referenced documents. |

7.4.2 xjdf:Resource

Table 7.16: xjdf:RunList xjdf:Resource Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|------------------------------|---------|--------|--|
| xjdf:Part | w← | r | xjdf:Part SHALL be specified if multiple resource elements are provided. |
| xjdf:RunList | w | r | The specific xjdf:RunList element. |

7.4.3 xjdf:Part

Table 7.17: xjdf:RunList xjdf:Part Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|--------------------|---------|--------|---|
| <i>Run</i> | w← | r | @ <i>Run</i> SHALL be specified if multiple resource elements are present in <i>xjdf:ResourceSet</i> [@Name="RunList"] unless pre-imposed press sheets are provided as content. |
| <i>SheetName</i> | w← | r? | @ <i>SheetName</i> SHALL be specified if multiple pre-imposed press sheets are provided as content. @ <i>SheetName</i> SHALL NOT be specified if @ <i>Run</i> is present. |
| <i>Side</i> | w← | r? | @ <i>Side</i> SHALL be specified if multiple pre-imposed press sheets are provided as content. @ <i>Side</i> SHALL NOT be specified if @ <i>Run</i> is present. |
| <all other values> | w! | | Other partition keys SHALL NOT be present. |

7.4.4 xjdf:RunList

Table 7.18: xjdf:RunList Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|----------------------|---------|--------|-------------------|
| <i>xjdf:FileSpec</i> | w | r | See ▶ [XJDF 2.1]. |

7.4.4.1 xjdf:FileSpec

Table 7.19: xjdf:FileSpec Element

| NAME | MANAGER | WORKER | DESCRIPTION |
|------------------------|---------|--------|---|
| <i>MimeType</i> | w | r | See ▶ [XJDF 2.1]. |
| <i>application/pdf</i> | w← | r | The <i>Worker</i> SHALL accept PDF documents. |
| <all other values> | w? | r? | Other values for mime type MAY be specified but are out of scope of this ICS. |
| <i>URL</i> | w | r | See ▶ [XJDF 2.1]. See ▶ Section 1.1.2 XML and ZIP Packaging and ▶ Section 1.1.3 Availability of Referenced Assets. |

Appendix A

A References

Throughout this specification references to other documents are indicated by short symbolic names inside square brackets (e.g., ▶ [PrintTalk 2.1]). Implementers need to read and conform to such referenced documents when implementing a part of this specification with such a reference. The reader is directed to this section to find the full title, date, source and availability of all such references.

Table A.1: References

| TERM | DEFINITION |
|-------------------|---|
| [ISO12647-2:2013] | <p>ISO 12647-2:2013</p> <p><i>Graphic technology — Process control for the production of half-tone colour separations, proof and production prints — Part 2: Offset lithographic processes</i></p> <p>Date: 2013 Produced by: ISO Available at: https://www.iso.org/store.html</p> |
| [ISO8601] | <p>ISO 8601:2004</p> <p><i>Data elements and interchange formats — Information interchange — Representation of dates and times.</i></p> <p>Date: 2004 Produced by: ISO Available at: https://www.iso.org/store.html</p> |
| [PrintTalk 2.1] | <p><i>PrintTalk Specification</i></p> <p>Version 2.1 Date: August 2020 Produced by: CIP4 Organization Available at: http://www.CIP4.org</p> |
| [XJDF 2.1] | <p><i>Exchange Job Definition Format Specification</i></p> <p>Version: 2.1 Date: August 2020 Produced by: CIP4 Organization Available at: http://www.CIP4.org</p> |
| [XPath] | <p><i>XML Path Language (XPath) 2.0 (Second Edition)</i></p> <p><i>Version W3C Recommendation 14 December 2010</i></p> <p>Date: 14 December 2010 Produced by: World Wide Web Consortium (W3C) Available at: https://www.w3.org/TR/xpath20/</p> |

Appendix B

B Release Notes

This appendix contains a brief summary of items that have been changed in Automated Print Procurement 2.1. Refer to previous versions of the Automated Print Procurement ICS for a complete history of changes.

Table B.1: Release notes for Automated Print Procurement ICS 2.1

| ITEM | ACTION | DESCRIPTION | LOCATION |
|---|----------|---|--|
| Security | Modified | Encryption technology is now required for all transactions. | ▶ Section 1.2 Security. |
| Conformance | New | Chapter added. | ▶ Chapter 2 Conformance. |
| Credential [@domain="Respo nseURL"] | Modified | Cardinality changed to w? for <i>Man-agers</i> in the From element. | ▶ Table 3.3 From Element. |
| <Business Object> | Modified | Multiple specific <i>Business Objects</i> have be replaced by a single <i>Business Object</i> in Request . | ▶ Table 3.6 Request Element |
| Business Object Types | New | Section added to clarify support re-quired for <i>Business Objects</i> . | ▶ Section 4.1 Business Object Types |
| Confirmation | Modified | A Conformance Test was added for Confirmation . | ▶ Table 4.1 Business Object Types. |
| Refusal | Modified | A Conformance Test was added for Refusal . | ▶ Table 4.1 Business Object Types. |
| xjdf:AuditNotifica tion | Modified | Cardinality changed to w? for <i>Work-ers</i> in xjdf:AuditPool . | ▶ Table 4.5 xjdf:AuditPool Element. |
| xjdf:AuditResourc e | Modified | Cardinality changed to w? for <i>Work-ers</i> in xjdf:AuditPool . | ▶ Table 4.5 xjdf:AuditPool Element. |
| xjdf:ResourceSet [@Name= "DeliveryParams"] | Modified | Cardinality changed to w? for <i>Work-ers</i> in xjdf:ResourceInfo . | ▶ Table 4.10 xjdf:ResourceInfo Element. |
| xjdf:ResourceSet [@Name= "DeliveryParams"] | Modified | Cardinality changed to w? for <i>Man-agers</i> in xjdf:XJDF . | ▶ Table 5.1 xjdf:XJDF Element. |
| @ChildRefs | Modified | Cardinality changed to w? for <i>Man-agers</i> in xjdf:BindingIntent . | ▶ Table 6.2 xjdf:BindingIntent Element. |
| @MediaType | Modified | Cardinality of " <all other values> " changed to r? for <i>Workers</i> in xjdf:MediaIntent . | ▶ Table 6.11 xjdf:MediaIntent Element. |
| @FirstName | Modified | Cardinality changed to w? for <i>Man-agers</i> in xjdf:Person . | ▶ Table 7.7 xjdf:Person Element. |
| @Brand | Modified | <i>Conformance Requirements for Print Provider</i> changed to 'SHALL' in xjdf:Resource . | ▶ Table 7.9 xjdf:DeliveryParams xjdf:Resource Element. |
| @NaturalLang | Modified | Cardinality changed to w? for <i>Man-agers</i> in xjdf:NodeInfo . | ▶ Table 7.14 xjdf:NodeInfo Element. |

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