Introduction

Process-Resource Model

What is it?

Pancake production
Print production
Workflow puzzle

Thomas Hoffmann-Walbeck
Process-Resource Models

- Processes are described by verbs, resources are physical things, files or parameter sets.
  - Processes normally have several input resources, i.e., prerequisites that are needed for running a process.
  - Processes have one or more output resource(s), i.e., the result(s) that the process produces.
  - A output resource of one process might be the input resource of the next process (a “transitional” resource).
Process-Resource Model (PRM)

Let’s make pancakes!
Sorry, let’s make a PRM recipe
Process-Resource-Model for Pancake Production

- **bowl**
- **flour 1 cup**
- **whisk**
- **baking Powder 1 Tbls**
- **sugar 1/3 cup**
- **measuring devices**
- **milk 1/2 cup**
- **chef**
- **yolk**
- **beaten egg white**
- **eggs 2**
- **separate**
- **egg white**
- **baking Powder 1 Tbls**
- **pan Radius > 11**
- **stove**
- **oil 1 tbls**
- **chef**
- **mixing**
- **beating**
- **batter**
- **frying**
- **pancake**

**Preparation:**
- Mix flour, sugar, milk, eggs, and baking powder.
- Beat egg white separately.
- Combine all ingredients in a bowl.
- Fry the batter in a pan with oil.

**Equipment:**
- Bowl
- Whisk
- Measuring devices
- Milk
- Chef
- Yolk
- Beaten egg white
- Eggs
- Baking powder
- Pan
- Stove
- Oil

**Tools:**
- Mixing bowl
- Measuring cups
- Whisk
- Mixing paddle
- Chef's knife
- Non-stick pan
- Measuring spoons

Processes & Resources Must be Specified

- If you want to replace the “chef” by a “mixing robot”, a “frying robot”, a “separating robot” and a “beating robot” a precise specification for all processes and resources is needed, which...
  - ...must be clear, unambiguous, universal (not for pancakes only!) and represents a complete “language”
  - ...should be an open standard – otherwise the pancake manufacturers cannot buy robots from different vendors
- The specification is the tricky part - and, of course, robots must understand the language and can execute the processes accordingly.
- Please note: The PRM is just a model, just a description what to do (“recipe”). It’s not the production!
Example of PRM in Print (JDF)

- Production is described by a network of processes and resources.
  - Each process is executable when all mandatory input resources are available and the production time window is reached.
Model a print production workflow

https://www.torontomu.ca/~wdp/workflow-puzzle/print/print.html
PRM for Prepress in Commercial Printing

MIS – Production Controller – Planning Board

PDF pages → Preflight & optimizing → PDF pages → Colour conversion → PDF pages → Trapping → PDF pages → Page assigning

PDF pages → Defining sheet layout → Sheet layout → Page assigning

Plate → Imaging → Bitmap → RIPing → PDF sheets → Imposition → PDF pages
PRM for Prepress in Commercial Printing

MIS – Production Controller – Planning Board

PDF pages → Preflight & optimizing

PDF pages → Colour conversion

PDF pages → Trapping

PDF pages → Defining sheet layout

PDF pages → Page assigning

PDF pages → Plate

PDF pages → Imaging

PDF pages → RIPing

PDF pages → Imposition

PDF pages → Bitmap

PDF pages → Bitmap

PDF pages → PDF sheets

PDF pages → PDF sheets

PDF pages → PDF pages
What is still wrong with the chart?

- Resources such as PDF or plates are not sent back and forth to the Controller.
  » Rather references, where the PDF is stored in the file system.
- Most input resources are missing such as trapping details.
- Some output resources are missing, such as preflight report.
- Process and resource naming are not (X)JDF compatible,
  » E.g., instead of “PDF” it should be "Runlist"
- Everything is simplified, e.g., “RIPing” is not a process, but a process group.