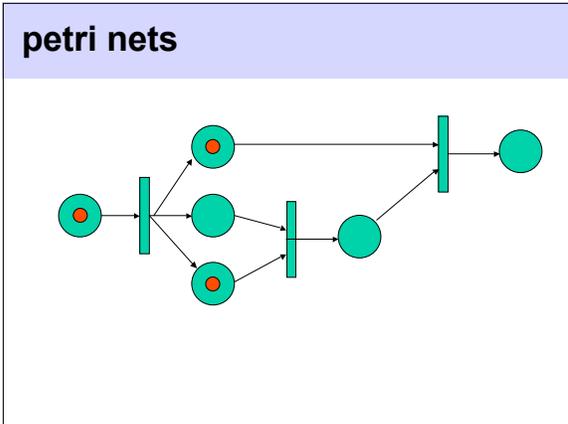
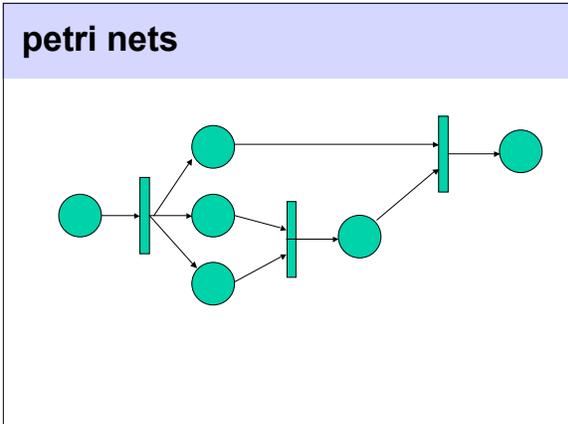
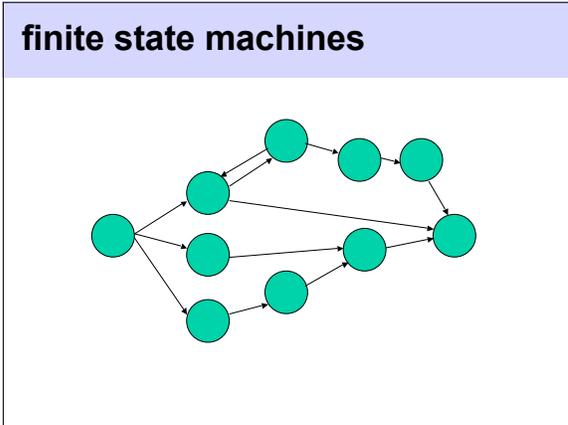


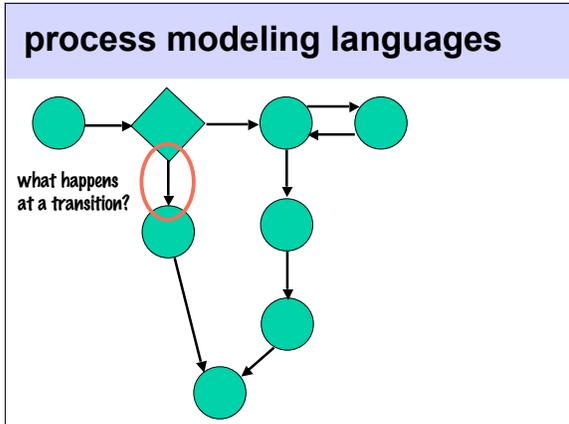
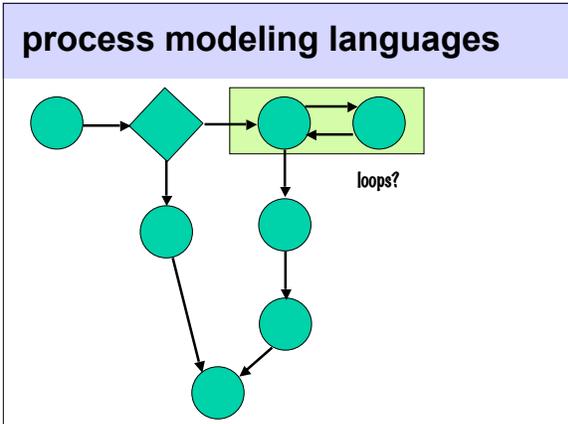
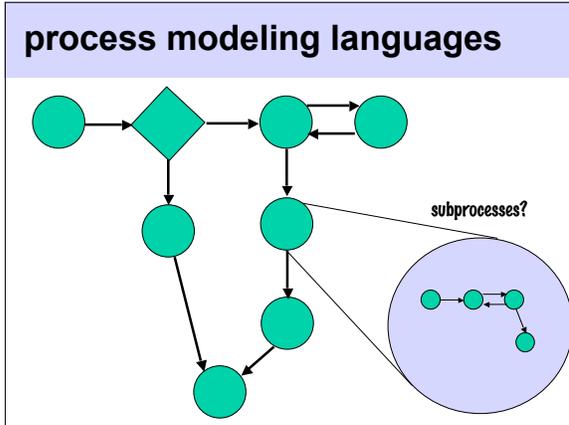
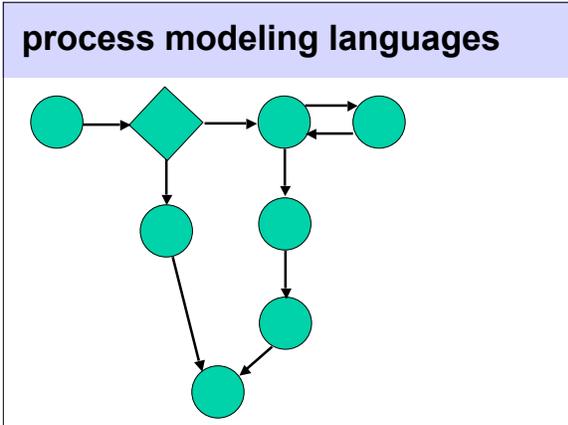
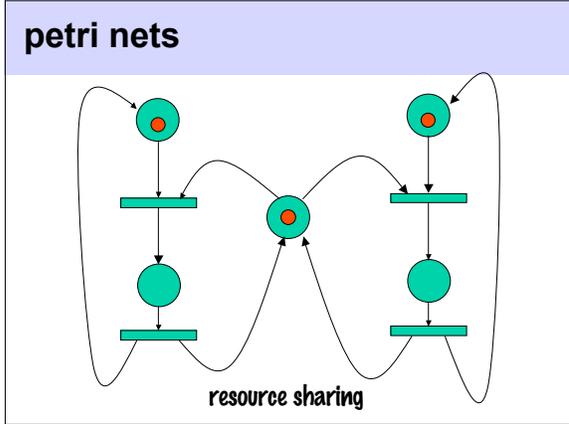
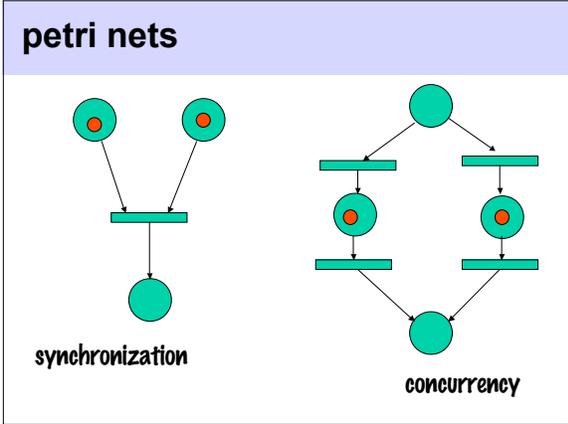
**what happens...**

- ... when you walk into Starbuck's?
- and why?

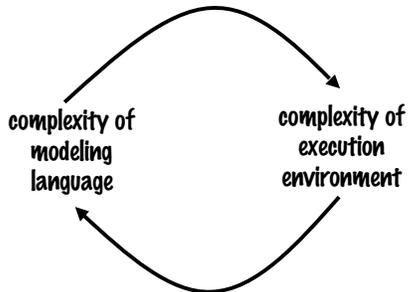
**machines and processes**

- the machine metaphor at work
  - standardization, measurement, repeatability
  - standardize outcome by standardizing process
- two key elements
  - a formal description of the process
    - so it can be analyzed, transformed, shared, exchanged
  - embodiment in software tools
    - tools are constrained to follow process
    - e.g. just as a wizard guides you through a step-by-step sequence of actions and prevents deviations





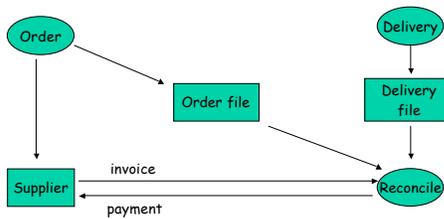
## modeling trade-off



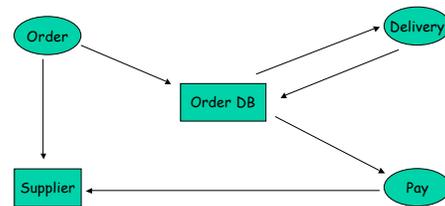
## BPR

- Business Process Reengineering
  - late 1980s to mid 1990s
  - focus on information flow
  - identify redundant or unnecessary steps
    - ... and eliminate them
  - critical role for technology
    - once your process has been redesigned, you need to make sure it's followed
    - you want to retain centralised control of the processes that are put into effect
    - workflow technology can accomplish this

## Ford : before



## Ford: after

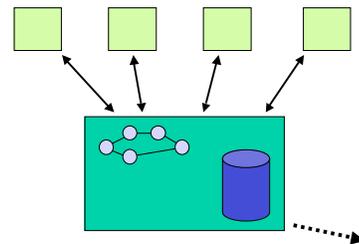


what does it take to achieve this?

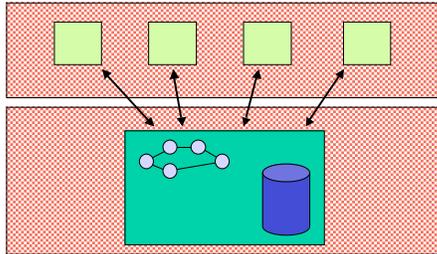
## process optimization

- that's half the story
  - eliminating redundancy
  - reducing round-trips
    - notice too that this works by turning your problems into the other guy's...
- and the other half?
  - need to ensure that the new process is carried out
  - a matter of control

## workflow architectures



## workflow architectures



dominant issues: *control & change*

## workflow technology

- technology for managing processes
  - embody an explicit representation of a process
- database of process *instances*
  - record details of each process
    - history, state, documents, etc
  - ensure the orderly execution of processes
    - turn process and tasks to to-do lists and action items
- some design questions
  - to what extent do people see the whole?
  - how can exceptions be managed?

## a major problem

- the basis for all this is finite-state technology
  - but the world is not finite
- exception management
  - trade-off again -- modeling or execution?
  - exceptions aren't exceptional
  - exceptions are often *\*good\**

## a case study

- workflow in factory production printing
  - the work from the systems' perspective
  - the work from the users' perspective
  - creative exception management
    - jumping the gun
    - balancing the load over machines
    - doing each others' jobs
    - blocking out time
  - where does the "smooth flow of work" come from?

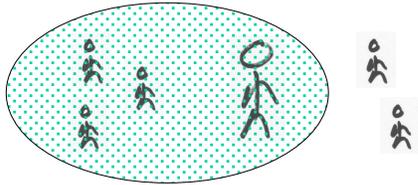
## an alternative for workflow

- workflow as an integration technology
  - focus less on automating internal processes
  - instead, on coordinating interactions
    - amongst organizations, clients, customers, suppliers
  - alternative view of process languages
    - a lingua franca between different technologies

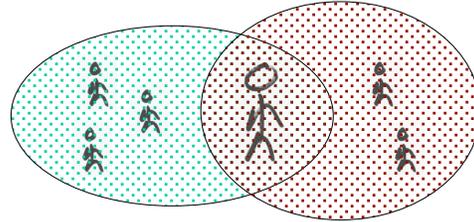
## workflow and integration



## workflow and integration



## workflow and integration



## however...

- degree of specification
  - balancing control with autonomy
  - different process languages vary
    - put the smarts in the language
    - put the smarts in the environment that executes it
- integration with existing practice
  - analysis of practice often focuses on what rather than why
  - we'll see this on Tuesday...

## next time

- more on the machine metaphor
- machine management of data
  - database systems
  - ER modeling
  - normalization