Process simulation

Enn Õunapuu enn.ounapuu@ttu.ee
+3725097720

Content

- Problem
- How?
- Example

Simulation Definition

Modeling and simulation functionality allows for pre-execution “what-if” modeling and simulation. Post-execution optimization is available based on the analysis of actual as-performed metrics.[6]

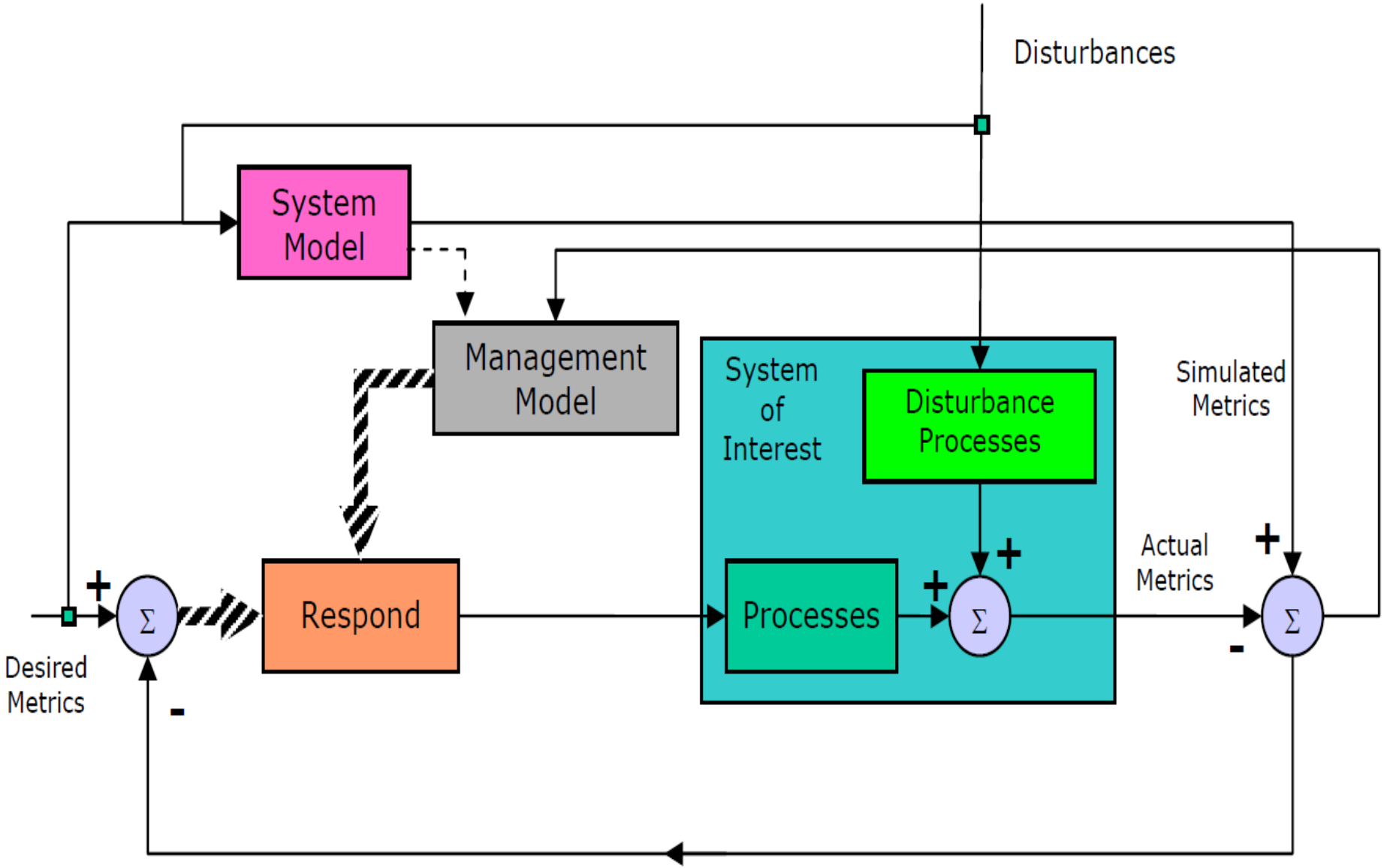

Figure 1. System models and management models work together in a real-time setting.

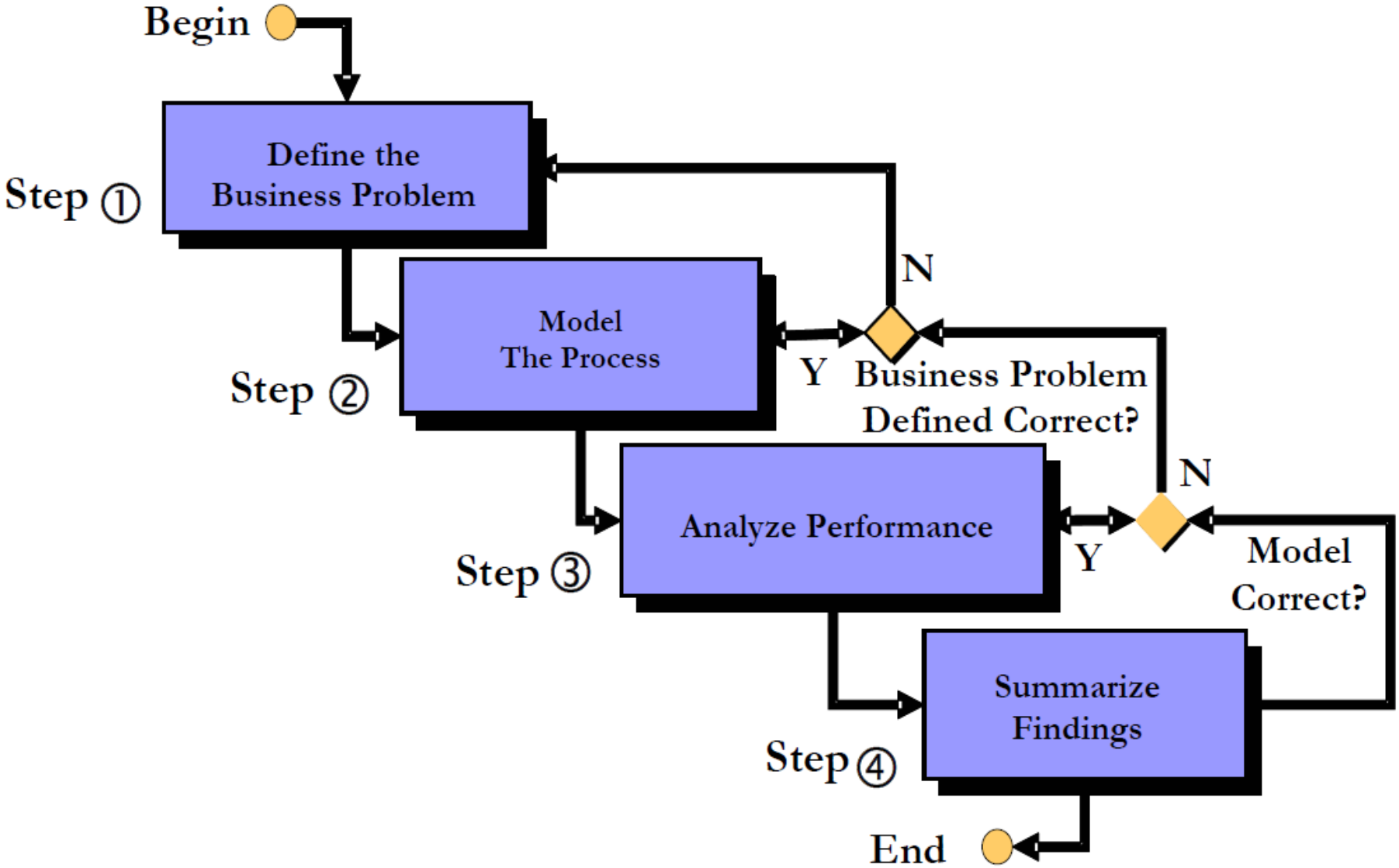

Figure 4. A design-of-experiments methodology.

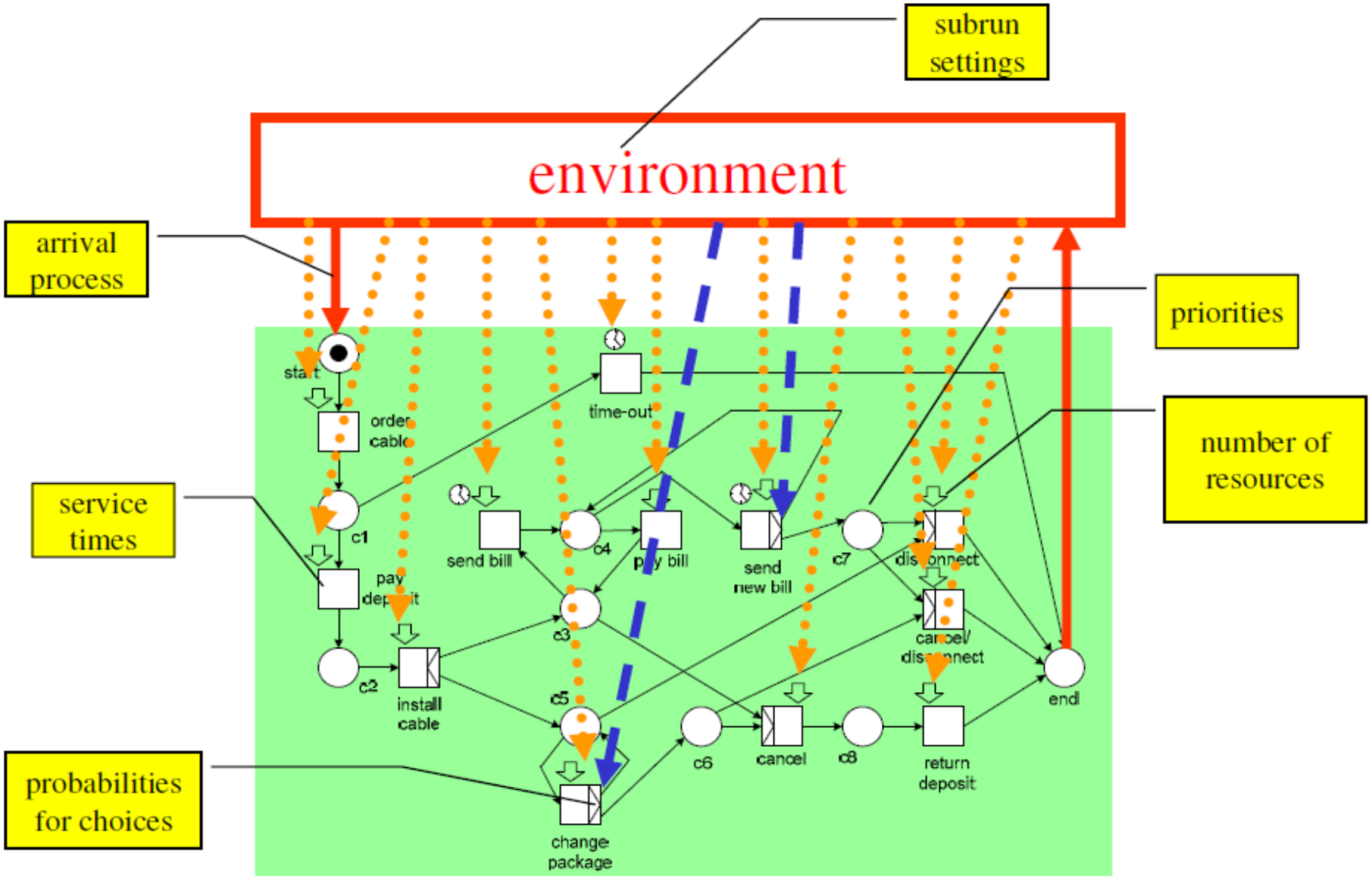

Fig. 1. Information required for a traditional simulation.

Bizagi simulation

Randomness is simulated by the use of probabilities for sequence flows and token routing and also by using statistical distributions to reflect variability in process times of activities etc. To make sure results are valid, the simulation needs be run for long enough to yield random behavior without chance (consider the scenario of tossing a coin or rolling a dice multiple times). Provision should be made to compare results from the same scenario, but different run lengths or replications.The required run length to yield usable outcomes depends on the process model structure, amount of variability and the objective; consequently, a single recommended run length cannot be provided. A replication shares the same scenario configuration and runs for the same length of time, but uses an alternative random stream.

Level 1 - Process Validation

Data: It requires estimated percentage splits of sequence flows to provide a basis for routing. It also needs the value of the trigger counter contained in the Start Event shape.

Results: The outcomes show all paths activated during the execution and whether all tokens actually finished. Additionally, it evaluates how many tokens passed through each Sequence Flow, Activity and End Event.

Level 2 – Time Analysis:

Second level of simulation to measure the end-to-end process time.

- Data: Apart from the data entered in *Process Validation*, estimated timings (service times) of each activity and the interval time between token generation is required. This data can either be constant or samples from statistical distributions[1].
- Results: The results show process throughput times for tokens, presented as minimum, maximum, mean and sum (total of all processing times). Similar results can be presented for individual key activities.

Level 3 – Resource Analysis:

Predicts how the process will perform with different levels of resources. This level of detail provides a reliable estimate of how the process will perform in operation.

Data: In addition to the data entered in Time Analysis, this level includes the definition of resources (and/or roles): how many are available and where they are used. Due to the inclusion of resources, the activity times should be adjusted to represent the actual work time; delay due to unavailability of staff will be explicitly indicated.

Results: The structure of the results is similar to Time Analysis. Also, the time spent, the time spent busy or idle for each type of resource is presented.

Level 4 – Calendar Analysis:

Includes calendar information that reflects the process performance over dynamic periods of time, such as shifts, days schedules or weeks.

Data: Apart from the data entered in Resource Analysis, it includes the definition of resource calendars.

Results: The structure of the results is similar to Resource Analysis.

Demo

ID035P.intra.ttu.ee

Questions?