

# Simulation Process

Study Real Problem

All of Elements: entities, stations, resources.  
All of Behaviors: move criterions, delay, transfer,  
batch size, times.  
Collect data: collecting, distributing.

Develop Model

Draft Model: elements, relation.  
Develop Sim. Model: objects, link, parameters,  
terminating, replication, stat. accum.

Verify and Validate Model

Model Testing: run & watch for wrong behavior.  
- normal parameter.  
- extreme parameter.  
\* easy watching on graphic animation.

Experimentation

Define Hypothesis: what method might improve system.  
Define Process Parameters: what and how parameter be set.  
Run Replication: define statistical run criterion  
and run every hypothesis.  
Collected Statistics: accumulate output of each.

Conclusion and Report

Compare, conclude, and report.

# Real Problem

Banking

Purchasing Department

Production Line

Assembly Line

Warehouse

Service Shop

Retail Shop

Traffic

Distribution

Restaurant

Document Processing

Etc.

# Basic grocery model



# Basic grocery model (Cont.)

What are resources of system and what are behavior?

Cashier (or grocer) :

1. packing
2. check credit card and print slip.
3. receive cash
4. change
5. exchange

Which customer process must be used resource?

Packing

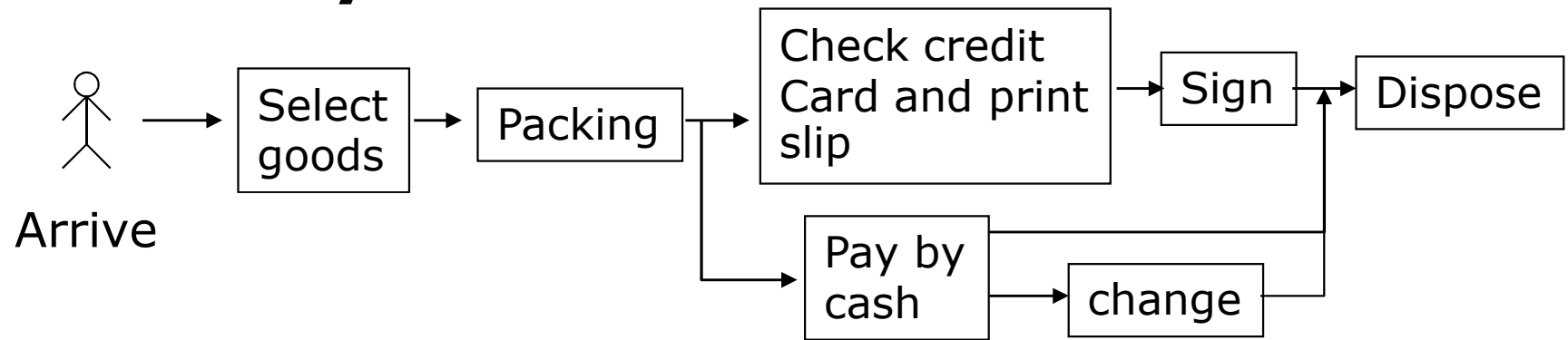
Check credit card and print slip

pay cash (cashier receive cash)

change

exchange

# Model Layout



Student Work shop – Group your own.

Define problem?

What are objective to improve this system?

What are Parameters?

What are Hypothesis?

# Basic elements in ARENA model

Create : Create entities and arrive to System

Process : Do any thing with entity

Entity : Object that arrive, be do any things, and dispose

Dispose : Position that entities leave from system

Decide : Shoot entity out more than 1 way by proportion, type, etc.

Batch : Combine entity

Separate : Separate batch of entity to be an entity

Assign : Assign any attribute, expression or anything to entity