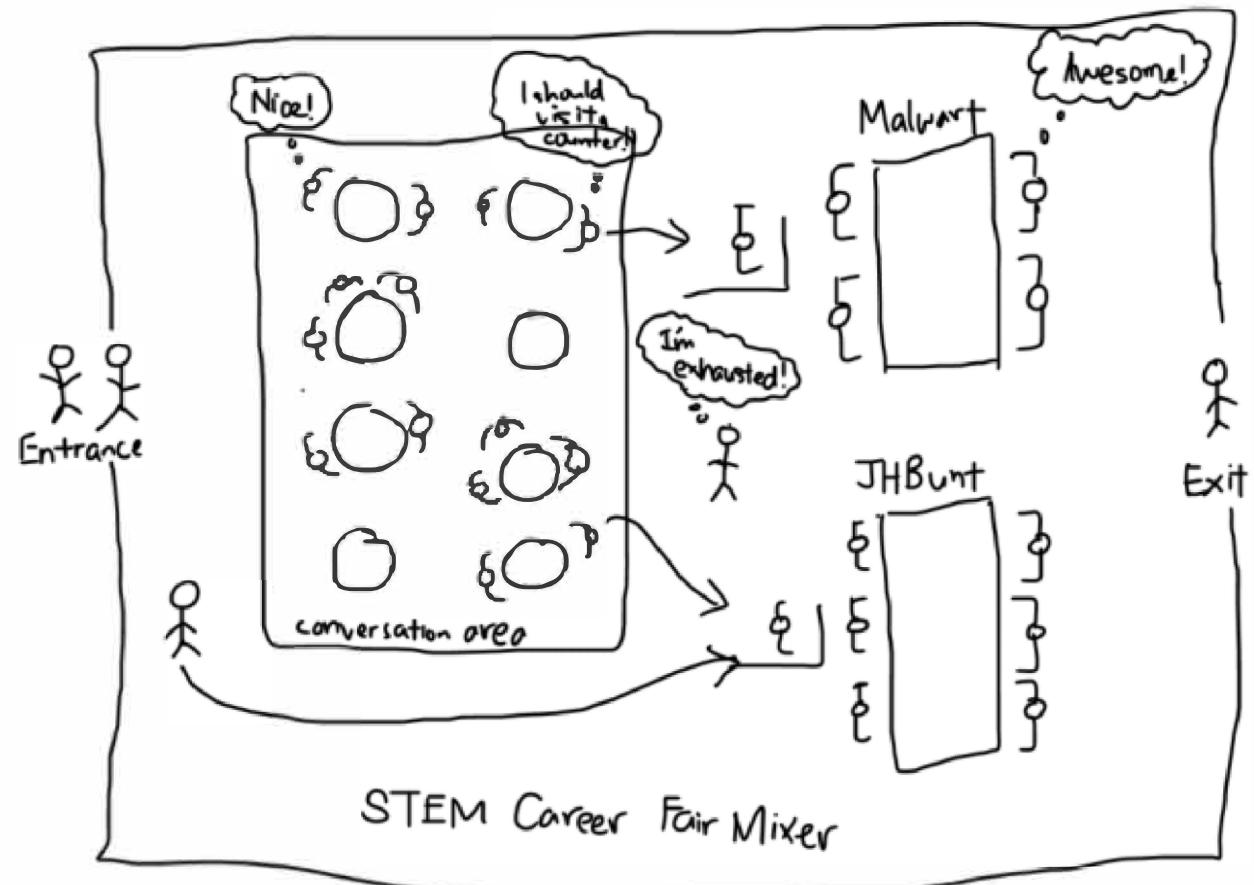


# DES elements of STEM mixer

Data Literacy Programme



# Outline

① Planning the model

② DES terms

③ Activity diagram

# Learning Objectives

- ① Learn to apply the DES elements into STEM career mixer.
- ② Draw an activity diagram for the STEM career mixer.

# Planning the model



# Involved elements in model planning

## Students

- Determined students (Type 1).
- Wanderers who manage to pluck up some courage later on (Type 2).
- Timid wanderers (Type 3).

## Booths

- MalWart
  - ▶ 2 recruiters.
- JHBunt
  - ▶ 3 recruiters.

## Waiting Lines

One line for Malwart and One line for JHBunt.

# DES terms

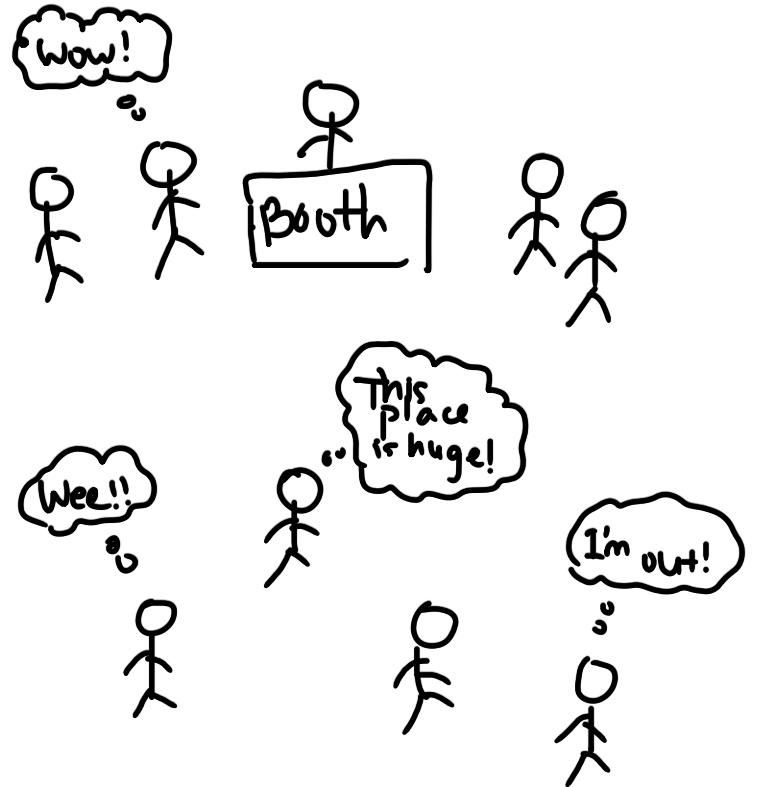


# System

STEM mixer event

System state: The number of students in the mixer.

- Number of students at each company booth.
  - ▶ Number of students queueing at each booth.
  - ▶ Number of students being served by recruiters.
- Number of students wandering around.



# Entities

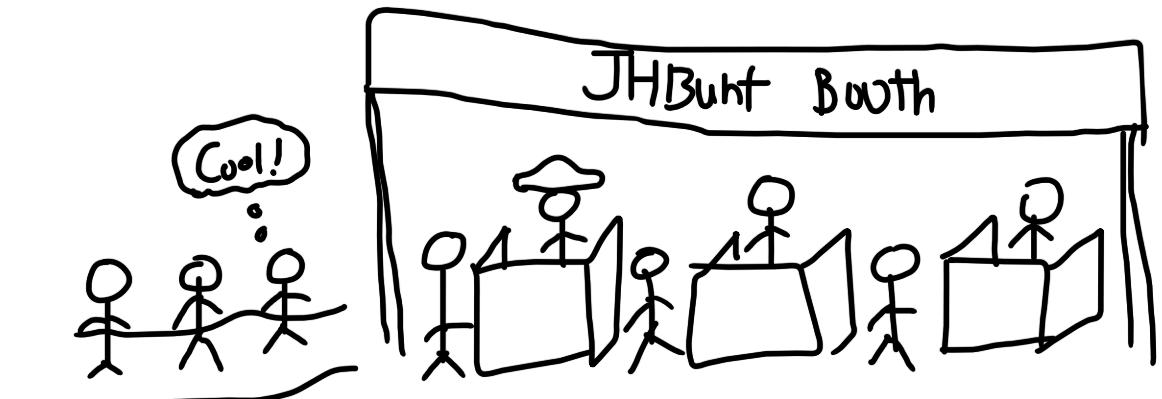
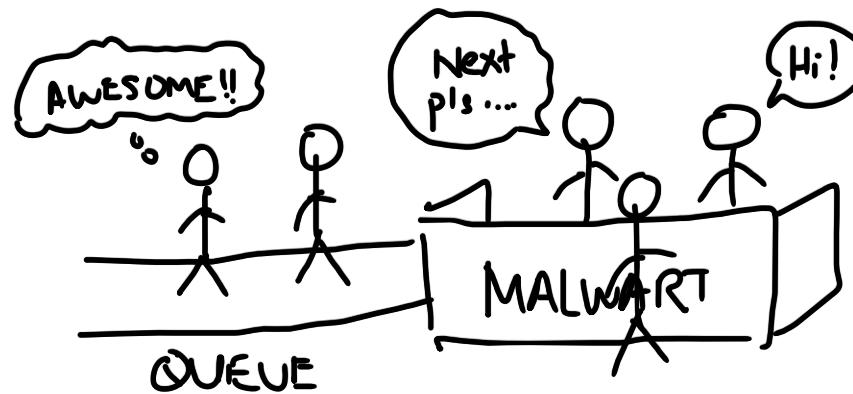
By definition, entities are the *objects that pass through the system*.

## Students

- Determined students (Type 1).
- Wanderers who manage to pluck up some courage later on (Type 2).
- Timid wanderers (Type 3).
- Ultimately, it is important to know how much time does each type of student spend at the event.

# Resources

- ① Name-tag resource.
- ② Malwart booth.
- ③ JHBunt booth.



# Trajectories

- ① Students arrive according to a *Poisson process* with mean rate 0.5 students per minute.
  - ▶ Equivalently, the inter-arrival time of students is exponentially distributed with a mean of 2 minutes.
- ② Students affixing a name tag follows a *uniform distribution* between 20 and 45 seconds.
- ③ Split into wanderers (50%) and determined students (50%).
  - ▶ Wanderers stroll around with a duration following a *triangular distribution* with min: 10 minutes, max: 45 minutes, peak: 15 minutes.
  - ▶ In the end, 10% wanderers left while 90% wanderers visit the recruiters.
- ④ Time spent at two Malwart recruiters follows an *exponential distribution* with a rate of 3 minutes.
- ⑤ Time spent at three JHBunt recruiters follows an *exponential distribution* with a rate of 6 minutes.

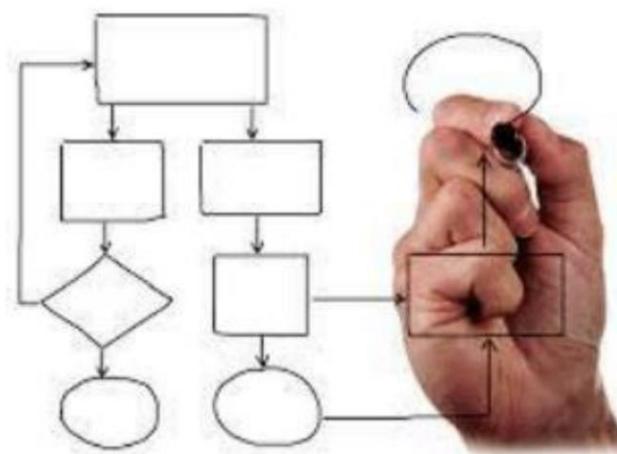
# Performance measures



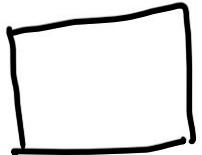
We wish to record the following measures:

- ① The utilisation of the resources at the two company booths.
- ② The number of students waiting in line at the two booths.
- ③ The total waiting time of students at the two booths.

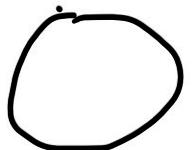
# Activity diagram



# Activity diagram



: Activity



: Queues/Resources

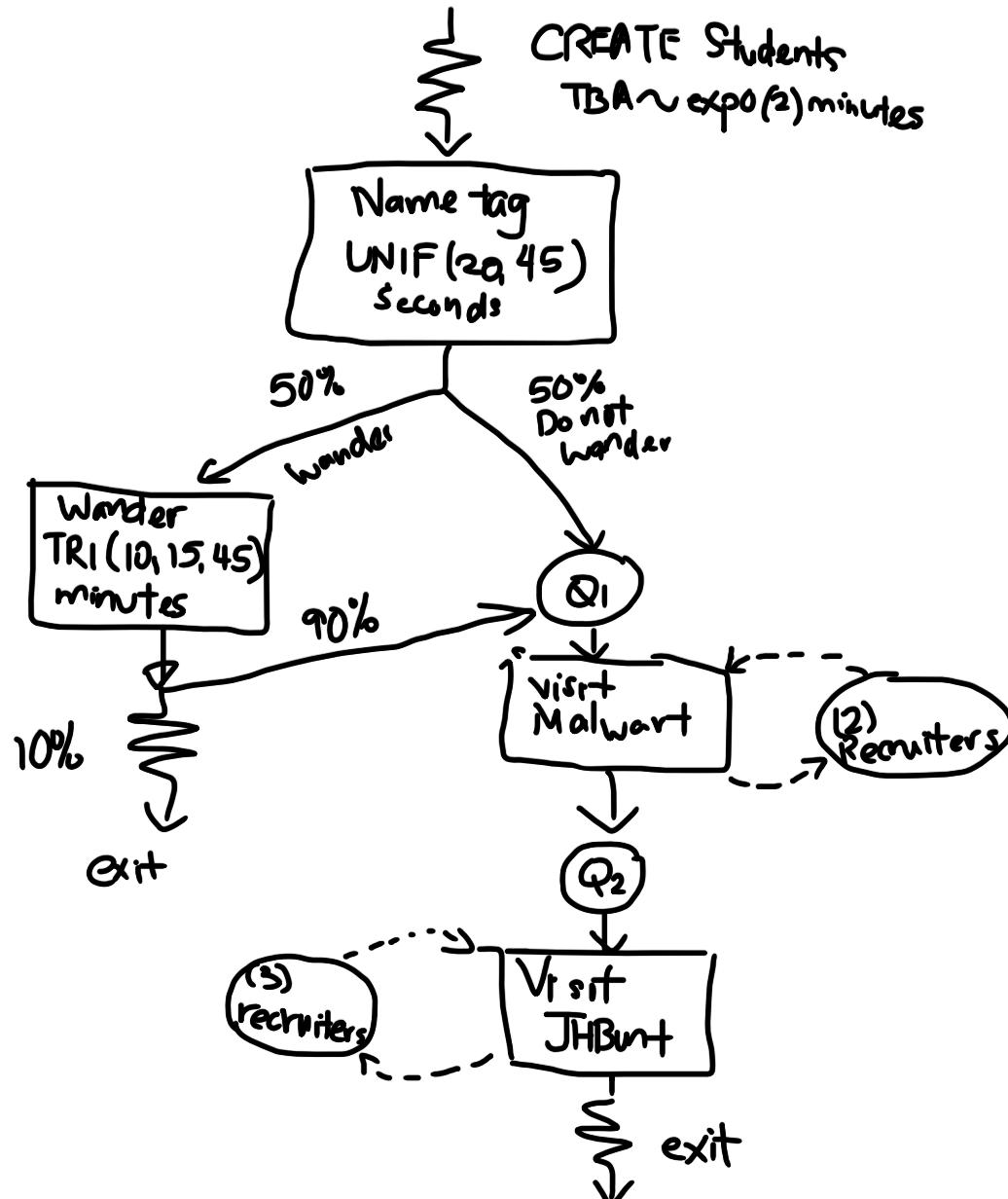


: Paths taken



: Arrivals/Departure of the system

# Activity diagram



# References

- 
- Rossetti, M. D. (2015).  
*Simulation Modeling and Arena*.  
Wiley Publishing, 2nd edition.