immerse
EDUCATION

Capstone Project

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Key considerations

1. Follow the structure in the capstone template.

2. Look for supervised learning problems:
   They are often the most feasible and can generate a lot of added value!

3. Ensure that your dataset assumptions are realistic.

Capstone Template

Produce 3 graphs with processes:

1. Current process (no AI)
2. Locate Gaps in that process to be solved with AI
3. Final solution with AI

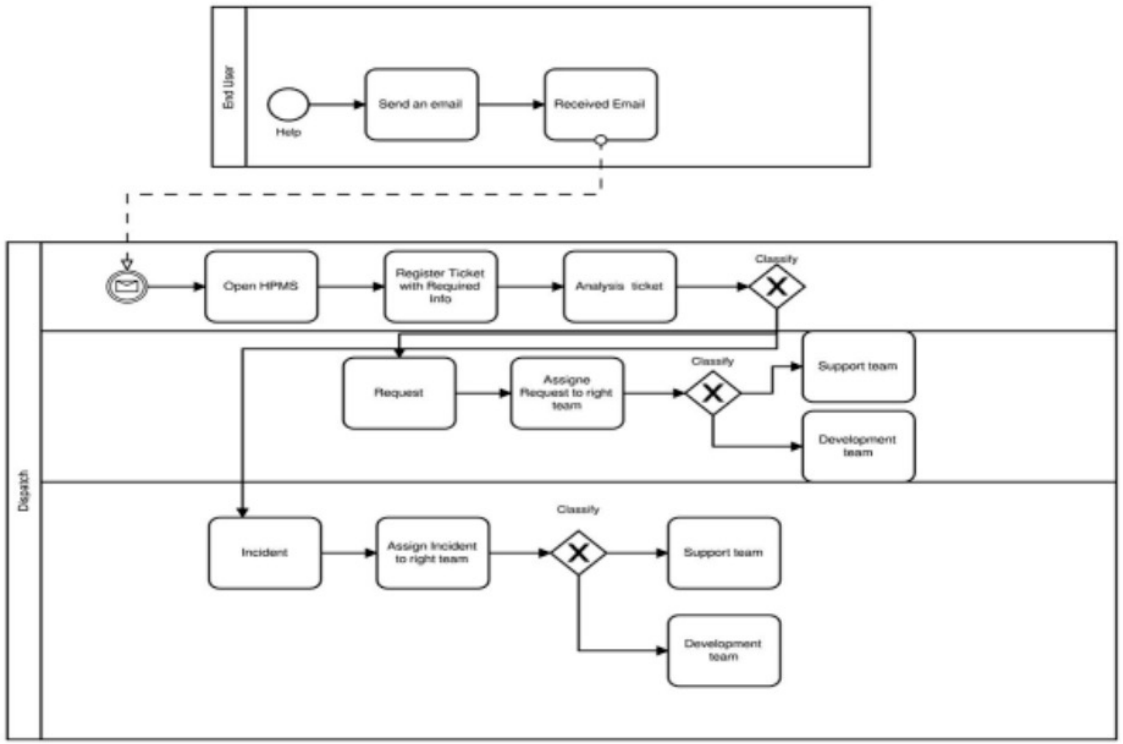
Below is the diagram

Example capstone 1: Tickets Dispatch

- **Motivation**: High volume of e-tickets reach service desk through emails and it takes a long time for people to manually address each e-ticket.
- **Can AI be applied?**: Can a machine learning model be used to automatically classify the content of the e-ticket and handle the requests in a more expedited process?
- **Dataset:** Previous e-tickets in the form of e-mails labelled with the action taken.
- **Approach:** Clear classification problem with a model trained through supervised learning with labelled data that is available in-house.

Example capstone 1: Tickets Dispatch

Current process



BPMN Solution deployment

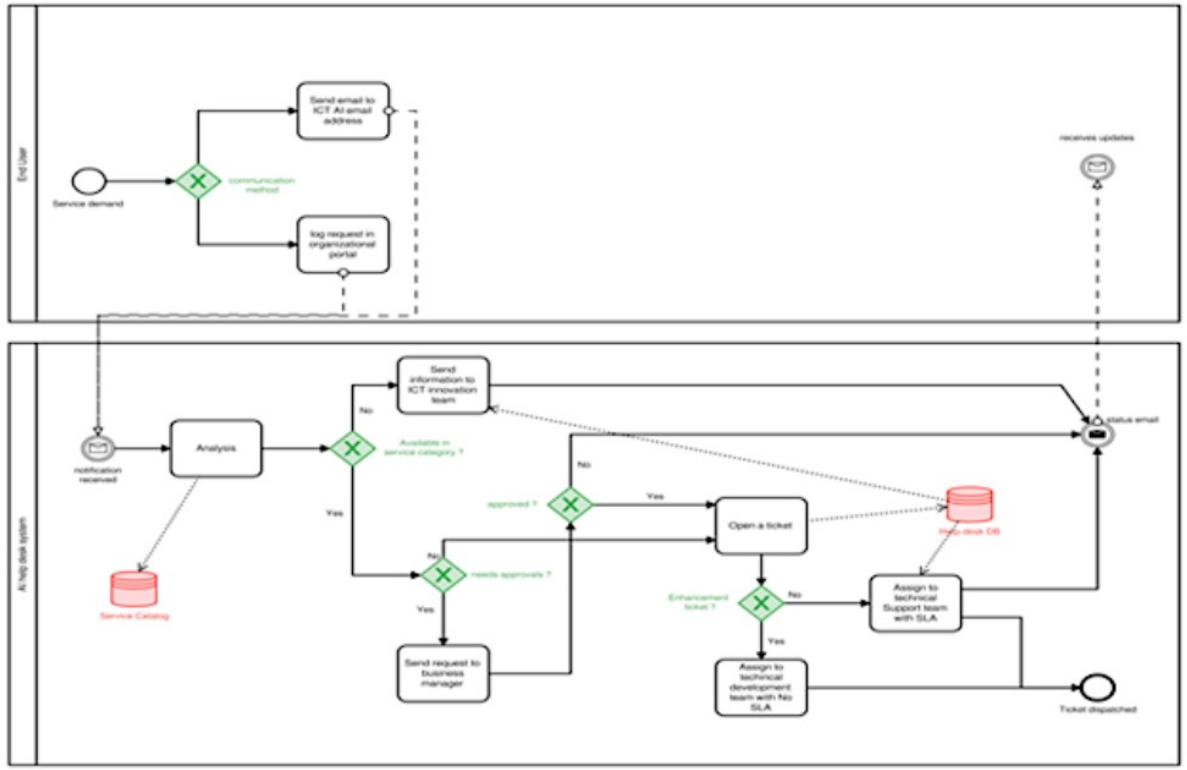


Figure 2. To-Be Process

Tips

1. Avoid using AI just for the sake of using AI.
    a. If AI does not solve the problem or lead to an improvement, then this problem does not benefit from AI.

2. Think about how to access the data. Is it realistic that this data would be made available to the AI development team?

3. What the AI does should be S.M.A.R.T:
    a. Specific, Measurable, Achievable, Realistic, and Timely.

Example capstone 2: Accident detection from video streams

- **Motivation**: High number of road accidents, identification requires people at the scene, leads to delays in a life or death situation.
- **Problem statement**: Can a machine learning model be used to automatically detect road accidents from cameras?
- **Dataset:** Video clips with annotations of accidents.
- **Approach:** Classification problem setting, well established machine learning technology → high chances of success.

Tips

1. Make sure that machine learning is necessary, as opposed to a simple automation algorithm.

2. Look for related work: many ideas are transferable.

3. Focus on narrow tasks (e.g. classify videos, predict a house price) rather than broad ones (e.g. AI that can propose new laws), they are a lot more feasible!

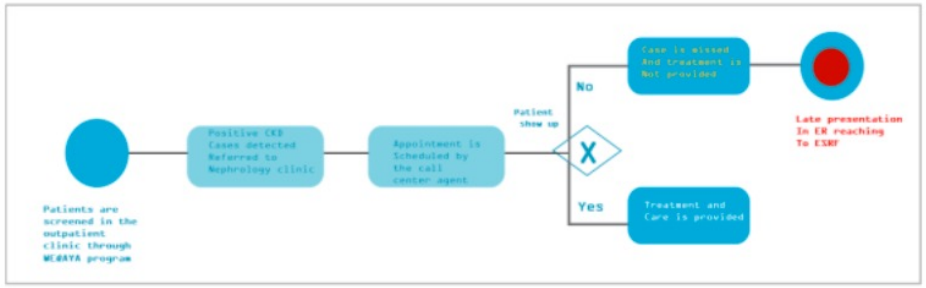
Example capstone 3: Prediction of chronic kidney disease deterioration

- **Motivation is evident**: High prevalence of CKD in the UAE + shortages in nephrologists + late presentation of deteriorating patients in the ER.
- **Well-defined opportunity for AI**: How can a machine learning model be used to identify deterioration among CKD patients early?
- **Dataset:** Identification of approvals required (ethics), de-identification, pre-processing of input features.
- **Comprehensive report:** ticks all the boxes.
- **Diverse team**: Team members from SEHA, DAFZA, UAE Space Agency, & GDRFAD.

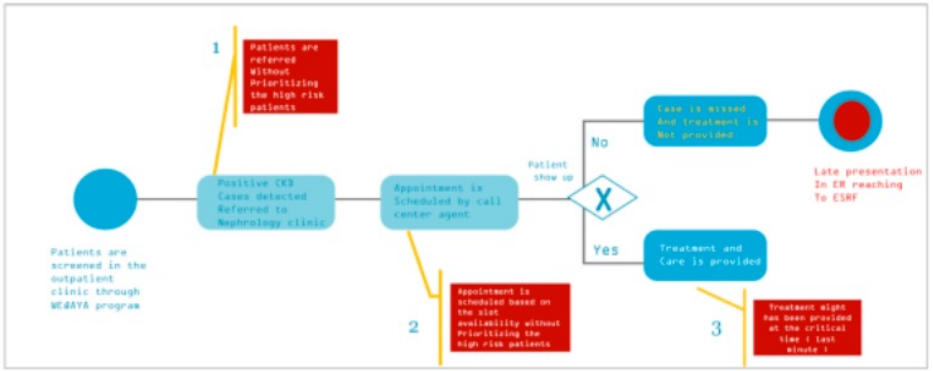
Capstone Template

Example capstone 3: Prediction of chronic kidney disease deterioration

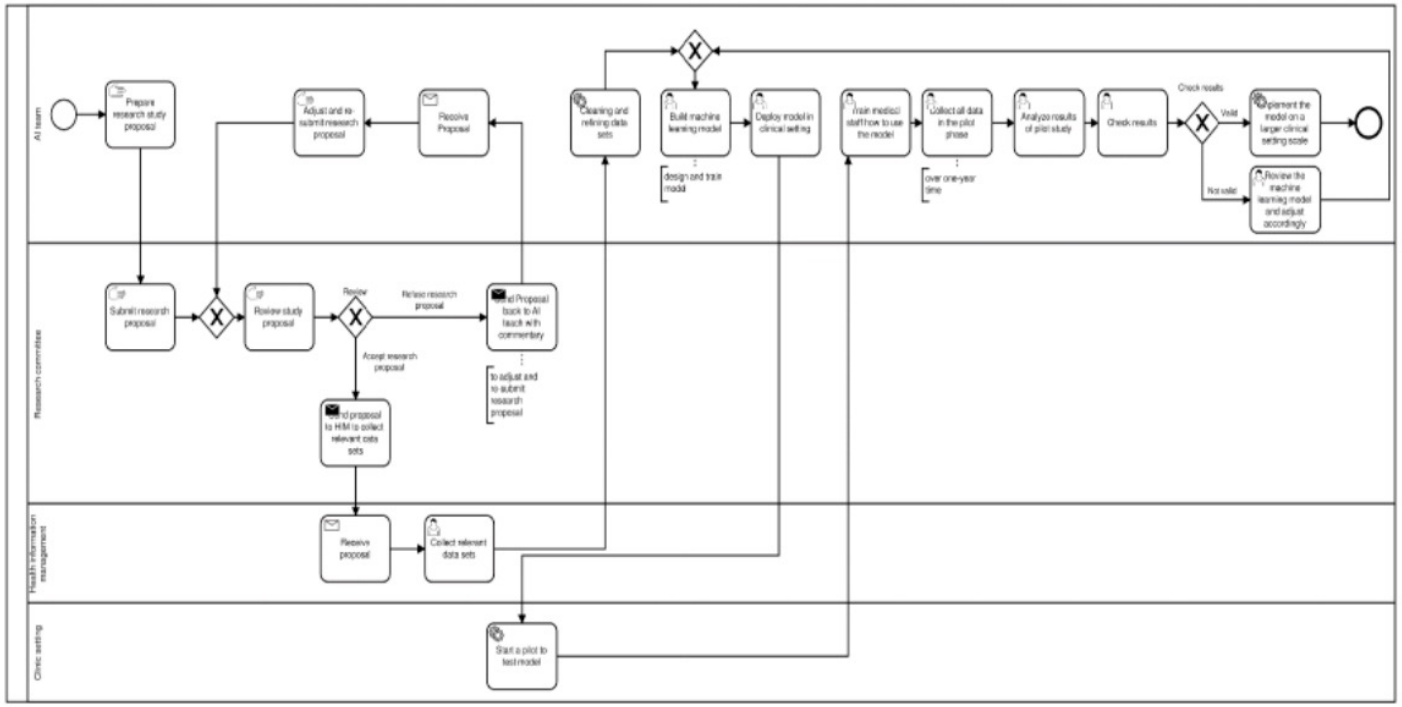
Current process



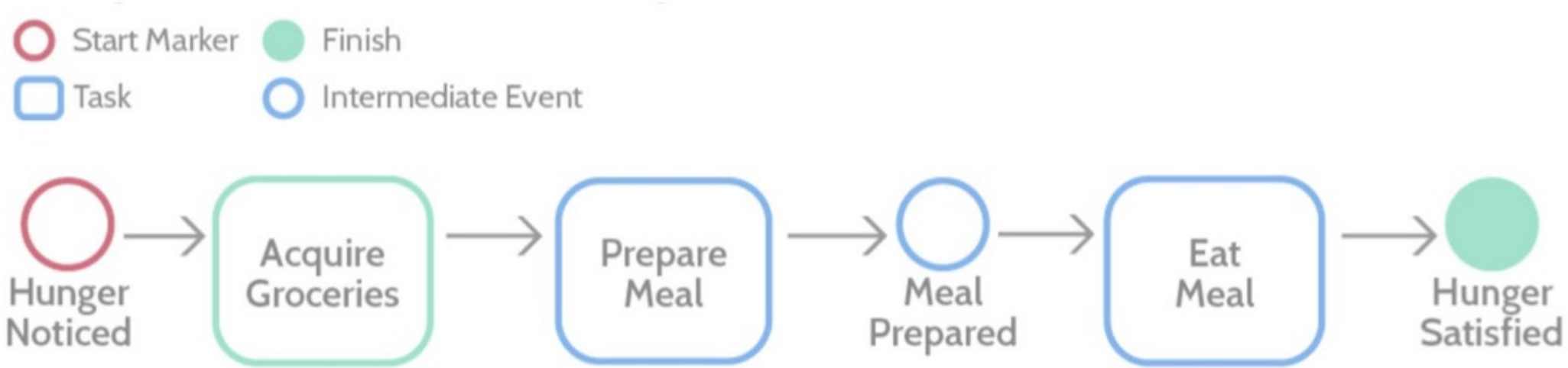
Gaps in the current process

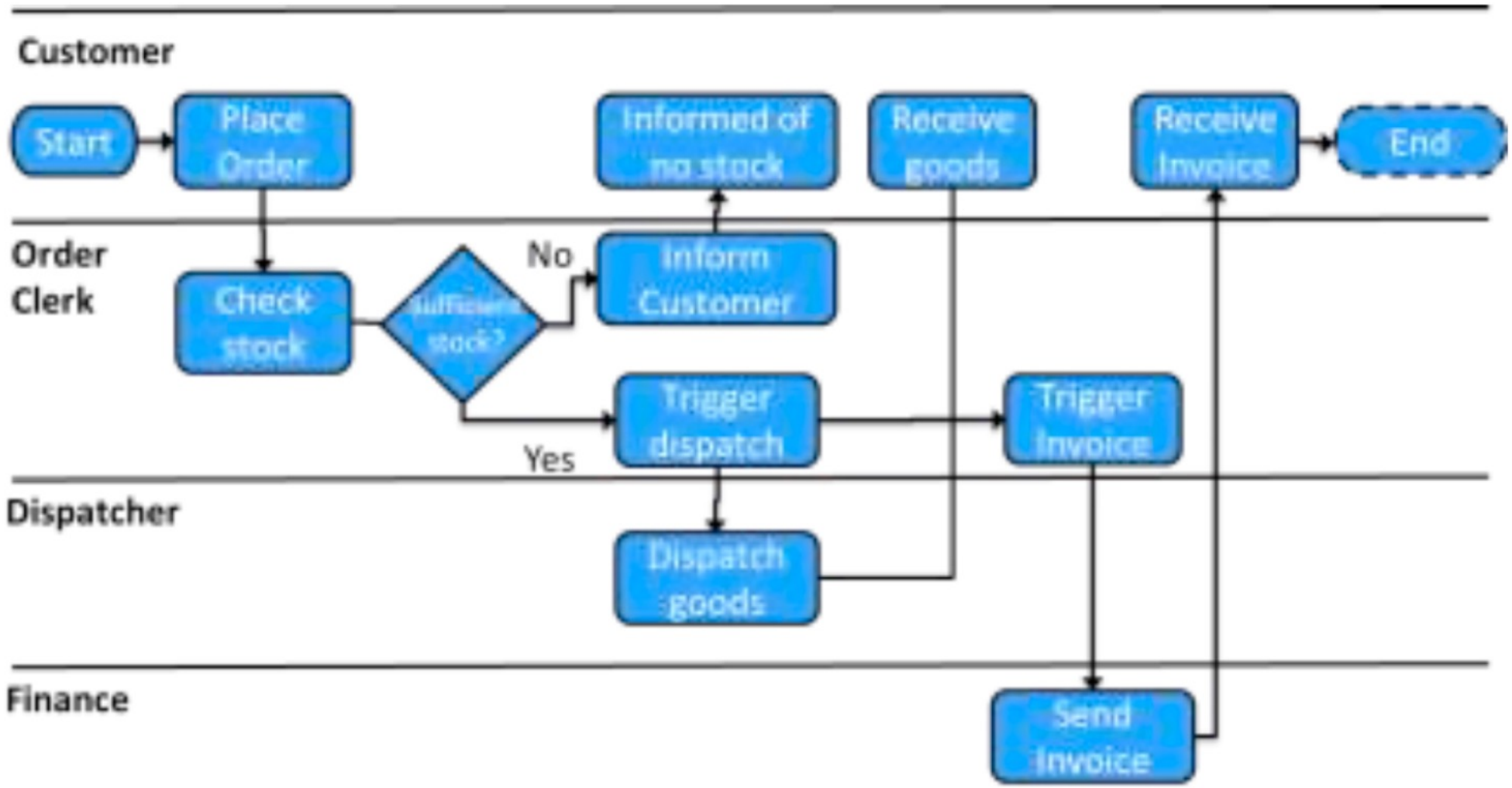


BPMN Solution deployment



Simple BPMN diagram




Customer
Start
Place Order
Informed of no stock
Receive goods
Receive Invoice
End
Order Clerk
Check stock
Sufficient stock?
No
Inform Customer
Trigger dispatch
Trigger Invoice
Yes
Dispatcher
Dispatch goods
Finance
Send Invoice

Tips

1. Make sure there is a justification for your product!
2. **Do not hesitate to ask questions!**
3. **Google** is your friend!

There are several tools available:

- VISIO on Windows
- OmniGraffle on Mac

Online Tools are Available

There are several tools available online:

- CAWEMO.COM
- BIZAGI.COM
- LUCIDCHART.COM