

Friday 2/24 - Meeting with Human Factors Engineer, NASA Ames Research Center; ATD-2 Analytics Lead and Digital Information Platform (DIP), NASA Ames Research Center; Former Traffic Manager and Current Digital Information Platform (DIP), NASA Ames Research Center

Notes

- Main Interface Frame
- Evaluating + FSM Visualizations
  - Constraint Summary is automatically generated as the data comes in
    - Would be good to explain what the assumptions are
- Modeling
  - Are there filters for the AFP vertically (altitude)?
    - Indicate the altitude on the statistics for modeling
    - Can capture flights that do not need to be restricted
  - Is there a need for the second screen given that there is a lot of white space?
    - Better likelihood the command center makes use of two screens
      - Concerned with space but not as much
    - Predict traffic over a specific airspace (can draw a polygon or FCA arc over it)
      - Have another panel where they can set the maximum, rate, and see the outcome in terms of predicted delay
    - Typically demand and FSM is in one panel, in addition to airspace view
      - Could be floating windows that are draggable
    - Potentially have a third monitor for weather
      - TSM can overlay weather over airspace, so may be separate client or application
    - Some sort of “What If?” capability
      - If we set this rate, it’s going to change x much, but if we set this rate it’s going to change by y
        - Need to see impact of AFP inputs/parameters
      - User may want to have this option (to change rate)
      - Parameters are not set only based on the visualizations (e.g. looking at the map in the center of our mock-up)
        - There is a step in between evaluating and modeling which includes collaboration, looking at the data (perhaps stats we output in FSM?), etc
        - Make sure to show this in your video or state this assumption in your essay
    - Can they tweak the proposed AFP and then publish the model? {yes}
      - Might consider showing additional information to show that it is the correct AFP (e.g. form validation)
        - Have several AFPs that are preset (similar to playbooks)
          - Could integrate into the system

- A way to have saved preset AFPs that you can then retrieve/tweak on the day of
- Might need to add feature of adding an arc or polygon into the airspace (to evaluate that area)
  - The outcome is the prediction of the number of flights
  - Can set the start and end time
  - Anything that leads to excess demand over capacity, way to measure this is to assess what the demand is in that specific area (where there may be restrictions in weather)
    - Being able to draw this polygon/arc would allow the user to first assess demand, as they already have the restrictions
    - Polygon/arc is what determines the count of flights in a given airspace
      - You then need to plot the demand in the graph
      - If you settle the restrictions (the original bar), you can see what excess demand is and determine how many flights have an EDCT
        - Consider including stats like # flights with severe departures (e.g. >45 min)
      - 15-minute increments instead of an hour
- Triangle depicting current time
  - How can demand in the future already arrive? (need to change colors on FSM visualizations)
- *Are we visualizing the impact well?* -> "Might be helpful to have more interactive tool showing the most optimal rate given the range (e.g. time) and demand"
  - Creates less trial and error for the user
  - Given the constraint that you have, what is the maximum rate that you can afford?
- How can users revise models to make demand not exceed capacity (when a user sees that demand exceeds capacity, what do they do?)
  - Next step is to edit the rate
  - Demand is most likely going to exceed capacity -> way to solve this problem is to enforce EDCT times
    - To enforce EDCT times, define some rate (the rate is more or less fixed, because they will always handle as many planes as they think is safe; not much room for revising the rate)
  - **The next step is to enforce the delay that is seen at the bottom**
    - Need to have better structure for this workflow
      - After seeing the impact of proposed AFP (e.g. how much delay it introduces), what happens if there's still a demand capacity imbalance? What if the delay is so severe for some flights?
        - Opportunity for reroutes, other TMs
  - Walk through a scenario to help generate what this workflow will look like

- Going to first try to use the maximum capacity they can afford
      - Must first identify that capacity (could be done by drawing the polygon)
    - Walk through the decision making steps (initial state, where you have nothing, where you have restrictions, where you have weather, etc.)
    - How many flights need to be assigned an EDCT?
    - Instead of changing the rate, you are changing the demand
  - # of flights w > 45 min delays
    - Could show portion of flights that receive large delays
    - Distributions of demand could be useful to show (tool for more advanced users)
      - Helps visualize which % flights
- Creating
  - Will require an End Time
  - How to notify others of rate change and AFP implementation
  - When a user needs to confirm, a summary would be nice to show what they are confirming
    - For user, a recap confirmation of start/end time, facilities, origin/destination
    - When at a decision point, want to verify what you're about to commit to