

AI-FIRST: BUILT IN QUALITY



CONTEXT

If you've ever had to create a schedule that juggled numerous people, assets, and objectives, you know it's like herding cats. It takes a lot of cognitive effort to track all the moving parts. This is the situation the Air Force found themselves in when it came to scheduling training and testing events that included different pilots, planes, target ranges, and more.

THE CHALLENGE

We were brought in to optimize an Air Force test flight scheduling task that took several schedulers months to complete. Our user research determined that the users had to keep track of numerous parameters and dependencies in their heads, in spreadsheets, and on whiteboards. These parameters kept changing, further complicating the task exhausting and frustrating everyone involved.

WHAT WE DID

Looking at the problem from an AI-first, human-machine perspective, we redefined the problem and task flow so that the system would do more of the work for the user. We also identified how the system could balance the parameters of the available assets and personnel towards the objectives to determine the most effective courses of action.

This suggested a Smart Scheduling tool that accepted the test flight objectives (requirements), pilot availability, and available assets (planes, bombing ranges, in-flight refueling, etc.) and then performed calculations to optimize the assets and pilots to achieve the training and test objectives.

SNAPSHOT



Combined UX and AI expertise



Us Dept of Defense



User Experience Research

PAIN POINTS

- Cumbersome and Time consuming scheduling tasks
- High potential for errors and inefficiencies

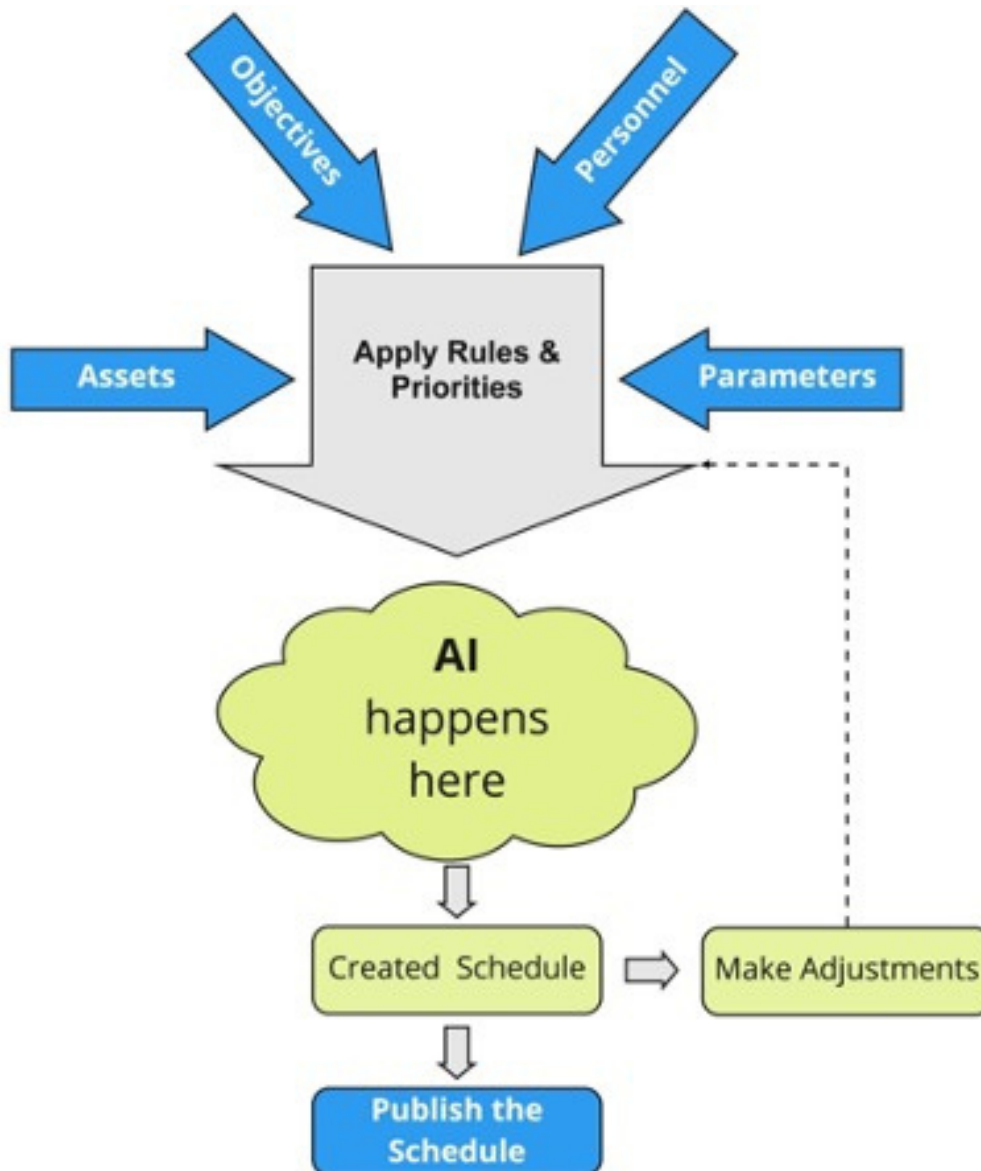
RESULTS

- AI-First design
- Saved many hours of time
- Reduced errors
- Increased efficiencies
- Required no training, could be used by anyone on the team

Have you noticed that typical scheduling tools don't schedule anything? They are merely schedule 'capture' tools. The users do the hard part of creating a schedule on a whiteboard or in their head, then input that schedule into the tool.

RESULTS & BENEFITS

The Smart Scheduler Paradigm (an AI algorithm) emphasized designing the system to do the difficult work for the human, effectively reducing the cognitive burden of balancing varying assets and personnel needs. After the system received the rules-based objectives, assets/resources, personnel, and other adjustable parameters and priorities, it automatically generated a suggested schedule. Users then adjusted the parameters, such as indicating a pilot was out sick, which triggered the system to recalculate the schedule using the prioritized objectives. This Smart Scheduler Paradigm reduced the typical pilot scheduling efforts from months to minutes.



The Smart Scheduler task flow was quite simple. Users only needed to define the system's elements, objectives, and priorities once. With each parameter adjustment, the system calculated a new schedule.

OUR PROCESS

This result achieved optimization by following good User Experience (UX) research and design practices to identify the opportunity. We began with discovery research, visiting several Pilot scheduling offices and observing the processes they followed. This highlighted that most of the scheduling was done in the user's heads and on whiteboards. We also captured a laundry list of various artifacts, assets, objectives, and parameters that schedulers used to create the most effective schedule, balancing the various facets of the schedule to achieve their objectives.

This information drove the task analysis effort to capture the workflow and cognitive effort required to create a workable schedule. Analyzing this task flow identified the opportunity for incorporating a simple rules-based AI to generate draft schedules that the user could review or adjust as needed. This resulted in an optimized task flow that drove the designer effort.

The research identified that the data required for the scheduling AI tool was contained within the domain and didn't include any personal identifying information (PII), thus avoiding data responsibility violations. The AI was also designed with guardrails and process rules to enhance validity and accuracy.

We collaborated with the client (management and development), testing and iterating several evolutions of the design approach to produce a completed design blueprint to be developed by the client's resources. This effort was completed within several months and is regarded as a truly innovative and successful product.

IN SUMMARY

The final product was very well received, saving weeks of cognitive effort. Moreover, people were able to use this tool quickly, requiring no formal training. This demonstrates a successful AI-First approach where the solution did more of the work for the users and required no training to use efficiently.

WORDS OF ADVICE

Rather than adding superficial AI tools to your existing product or service, consider how the task can be optimized with a collaborative human-machine system. Identify how an AI can do more of the work for the user and leave final actions or approvals to the human. Determine what data your AI will need. Will you be able to source the necessary data or will you need to create it? In either case, consider how to comply with ethical and responsible AI policies.

