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Beyond like-for-like: A user-centered approach to modernizing legacy applications

Madelyn Polzin and Michael Guzman
Fermilab, Accelerator Complex Technology Division, Controls Department

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Like-for-like

A replica of an existing application with the same user interface and functionality recreated with newer technology

The appeal of like-for-like

- Seems less risky than reimagining
- Users are already familiar with existing applications
- Requirements appear to be clearly defined
- Feels easier to manage project scope
- Stakeholders can easily visualize end result

Like-for-like pitfalls

- High probability of carrying over:
  - Existing pain points
  - Any inefficient processes and work arounds
  - Unnecessary complexity
  - Usability issues
  - Long training times
- Potential extra effort for custom development to replicate obsolete features
- Missed opportunity for more efficient user workflows

Legacy control systems were made with the limitations of old technology

Beyond like-for-like

How to avoid the pitfalls

- Start fresh
- Reevaluate the needs of users and purpose of the application
- Address inefficiencies in user workflows
- Leverage current technologies
  - E.g., browsers have accessibility features that can improve user experience

Okay but seriously, how?

- Sit down with your users
  - Operators
  - Engineers
  - Machine experts
- Examine and interrogate legacy control system design

Interrogating the legacy system

- Learning from users how they use the legacy applications can help define tasks and goals
  - And what they do with the information they engage with
- Investigate user workflows within an application and control system
  - Needs might not be addressed in a like-for-like replica
  - Certain tasks completed by interacting with multiple applications
- Investigate relationship between applications and tasking to uncover redundancies
- Question why user workflows exist
  - Is it due to the confines of the old technology?
  - Were applications needs put before user needs?
- Find what works and what doesn't

Sit down with your users

- Know your users
  - Even if you are already familiar with your users
  - The why behind their tasks
- User interviews and observations

Novice and expert users

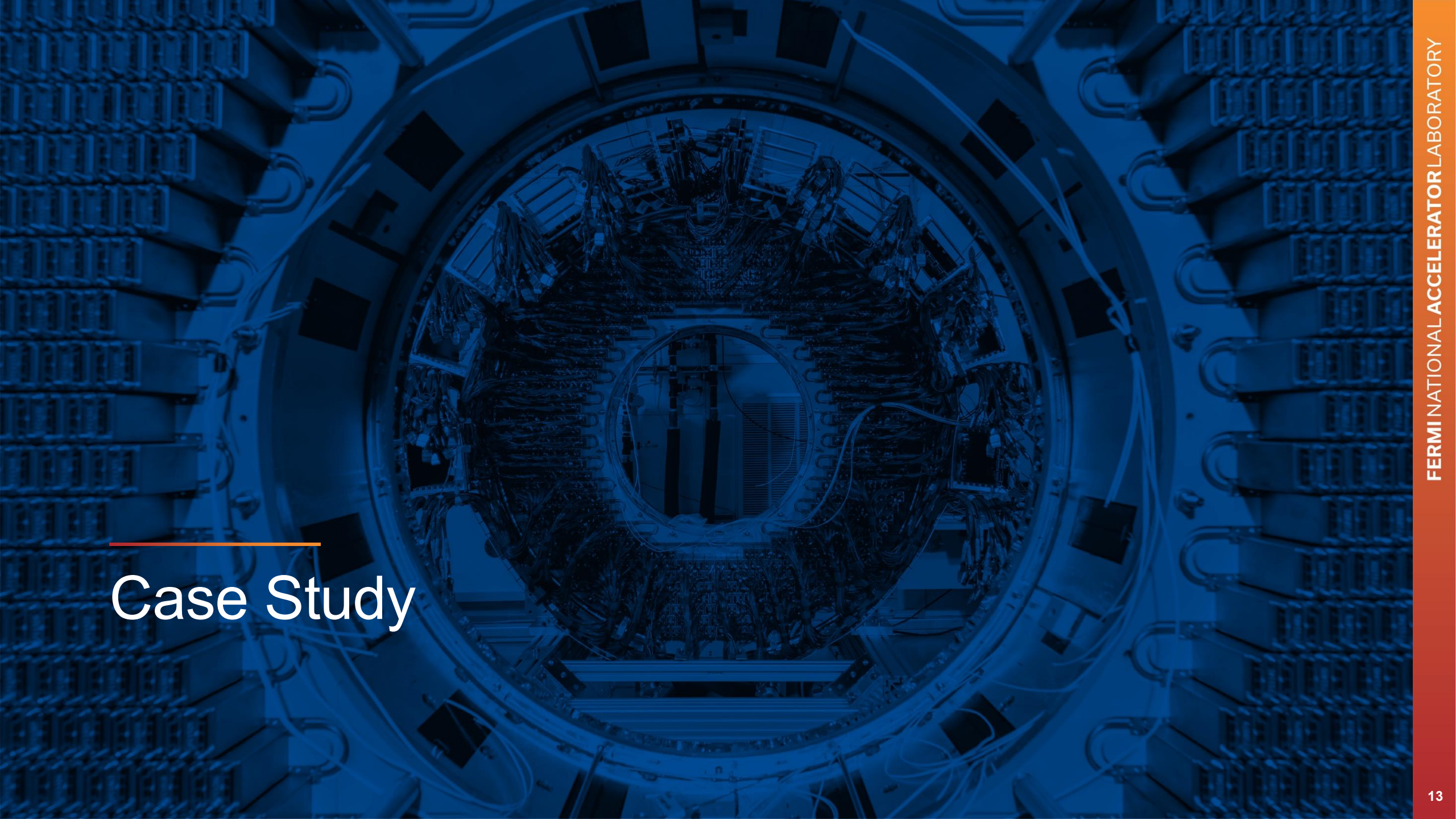
- They have different needs
  - Expert users know the control system very well (and the shortcuts)
  - Novice users are learning how to move through the control system (may need more context)
- If you only talk to expert users, you increase the chances of replicating an application that may:
  - Be less intuitive for novice users
  - Carry over any time-consuming learning curves that may exist

Involve your users

- ☑ Understand users
  - Design and develop with user input
  - Usability scenario testing
    - Opportunity for users to partake in scenario testing for legacy and modernized applications

Outcome

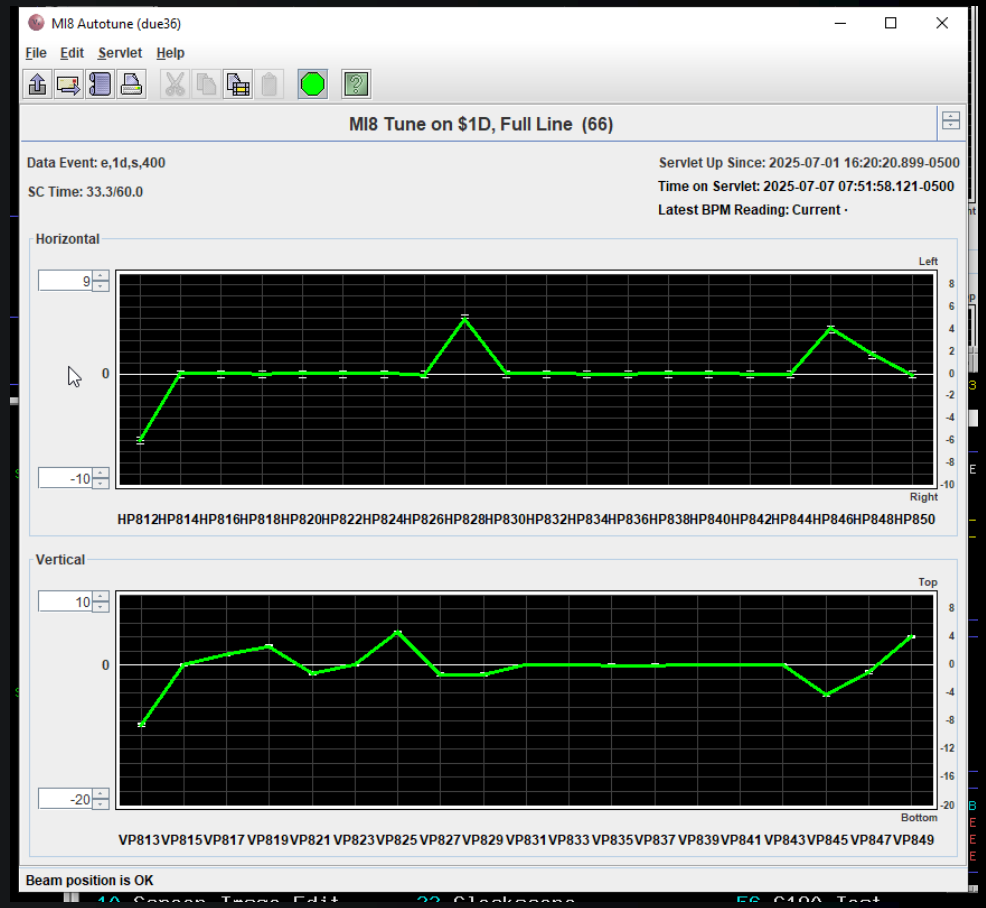
- Applications that better support users
- Increased usability
- Reduced training times
- More cohesion in the control system
  - Navigation
  - Cleaning up those redundancies



Case Study

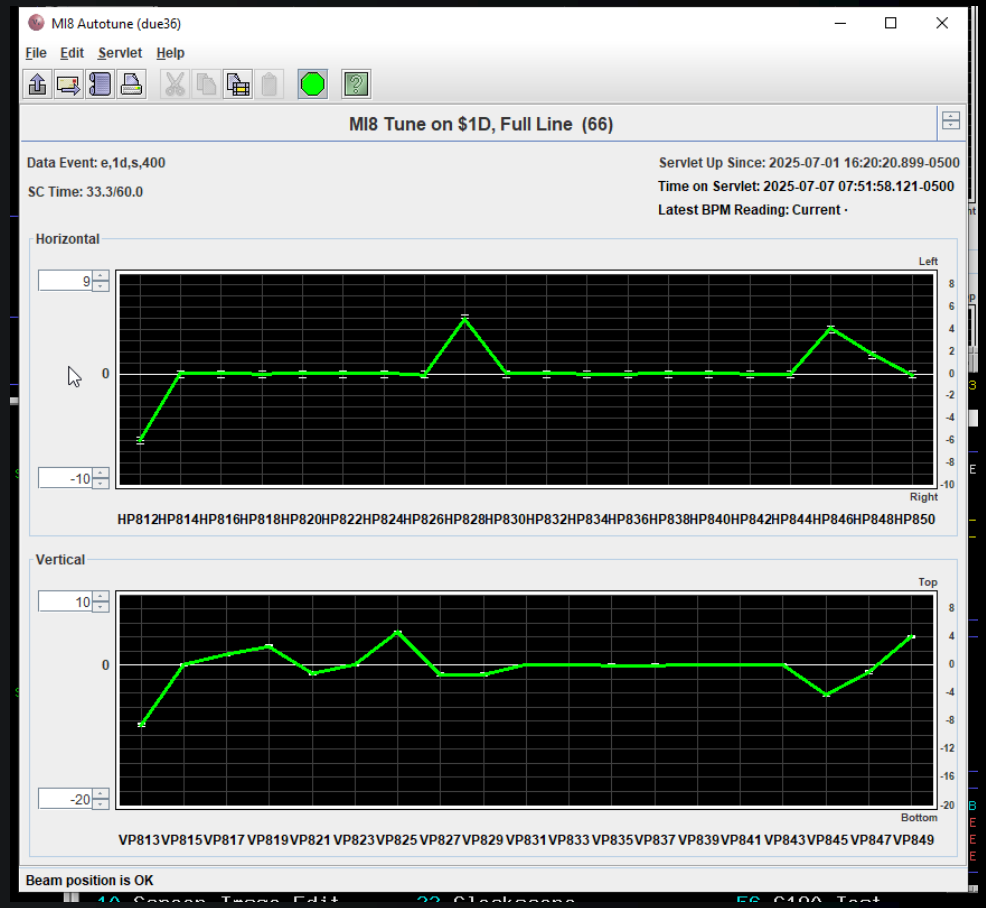
Autotune application

- Monitors beam trajectory in transfer lines
- Makes corrector adjustments when the trajectory moves away from desired path
- Users:
  - Main Control Room Operators: responsible for verifying Autotune is making appropriate corrector changes
  - Machine specialists and physicists: handle configuration



Autotune application

- Discovered pain points and limitations
  - Some work done by hand
- Sometimes paired with another application to workaround some limitations of Autotune
- Features exist that are not used
- We found opportunities to better support workflows



Thank you

Madelyn Polzin | mpolzin@fnal.gov

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