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Group Introductions

HeetShield

Olivia Vester - Team Leader

Kameron Napier - Team Release Manager

Gareth Carew - Team Architect

Problem Statement

HeetShield

- Our client: HeetShield
  - What do they do and how do they do it?
  - What do they need us for?

Image from HeetShield.com

Paper Making Process:

From Raw Materials to Finished Products.

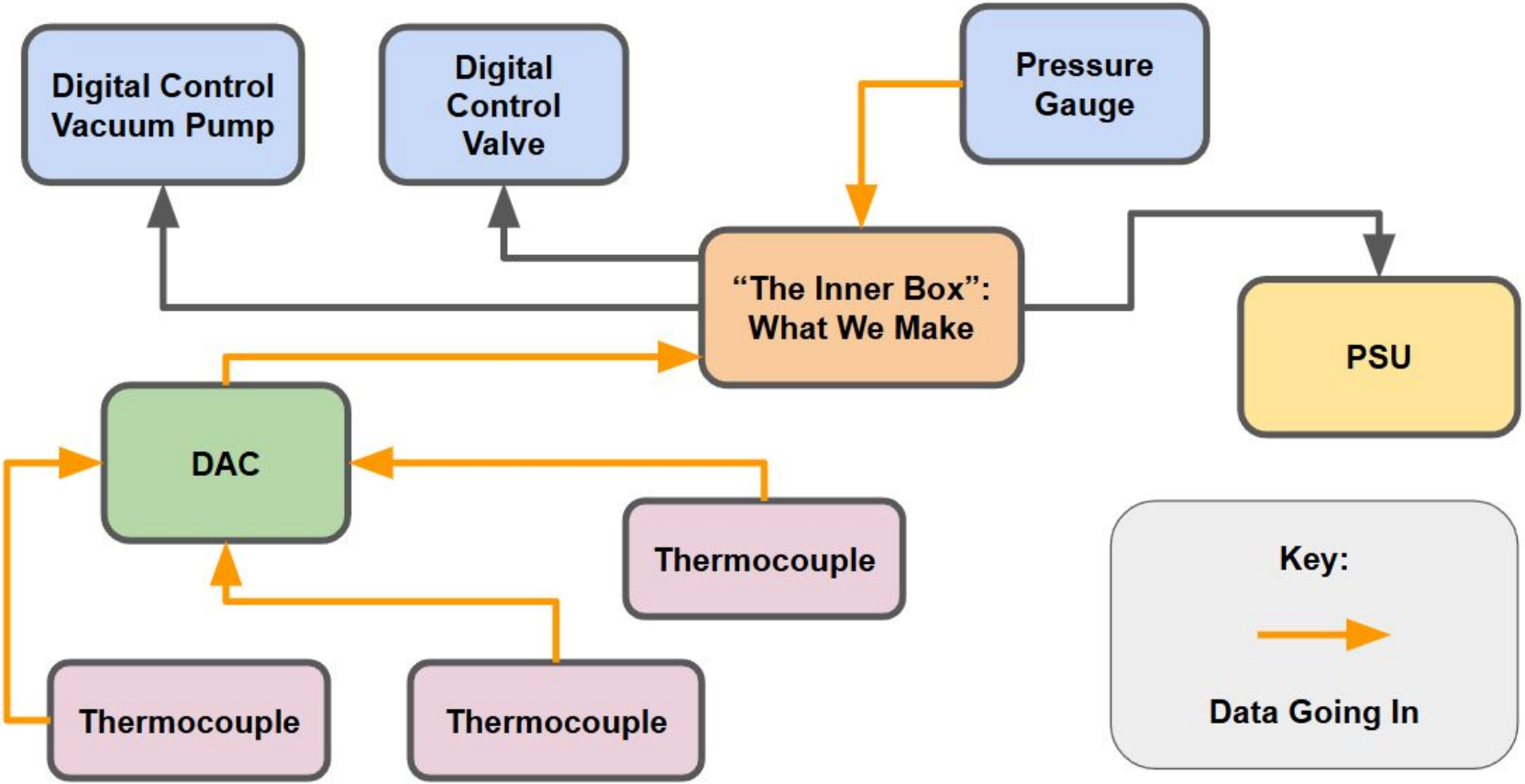
Image from World Paper Mill

- This is the testing apparatus

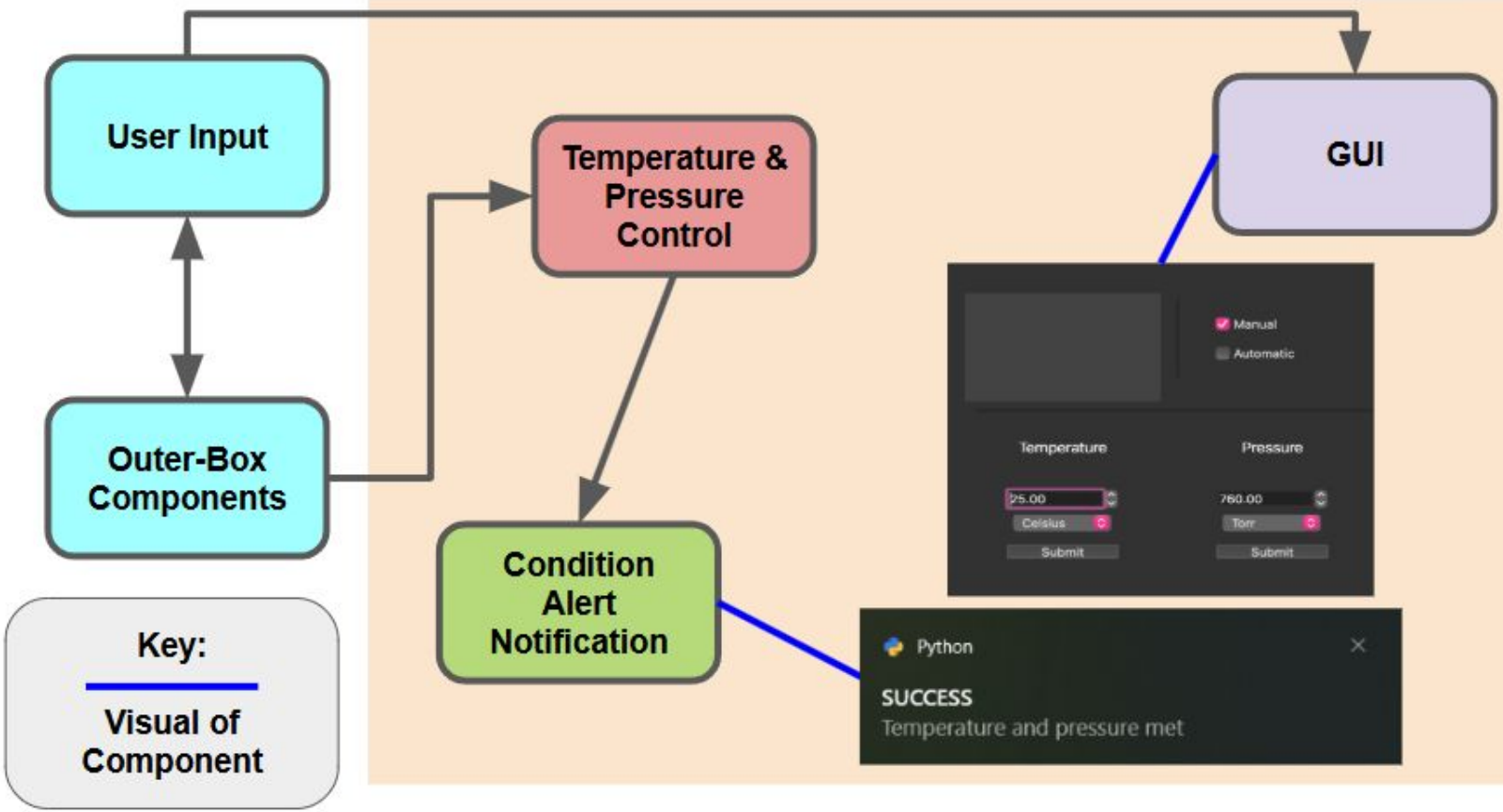
Solution Overview

- Create an automated testing system for their material
  - Read in pressure and temperature data
  - Determine what needs to be changed to reach desired environment
  - Send updates to the parts to adjust them
  - Repeat process until environment reached

“The Outer Box”: What Plugs Into What We Make



“The Inner Box”: What We Make



Requirements/Specs Review

- Original Plans
  - Real-time Data Acquisition
  - User Input and Parameter Validation
  - Automated System Adjustment
  - Communication and Control
  - Real-time Notifications

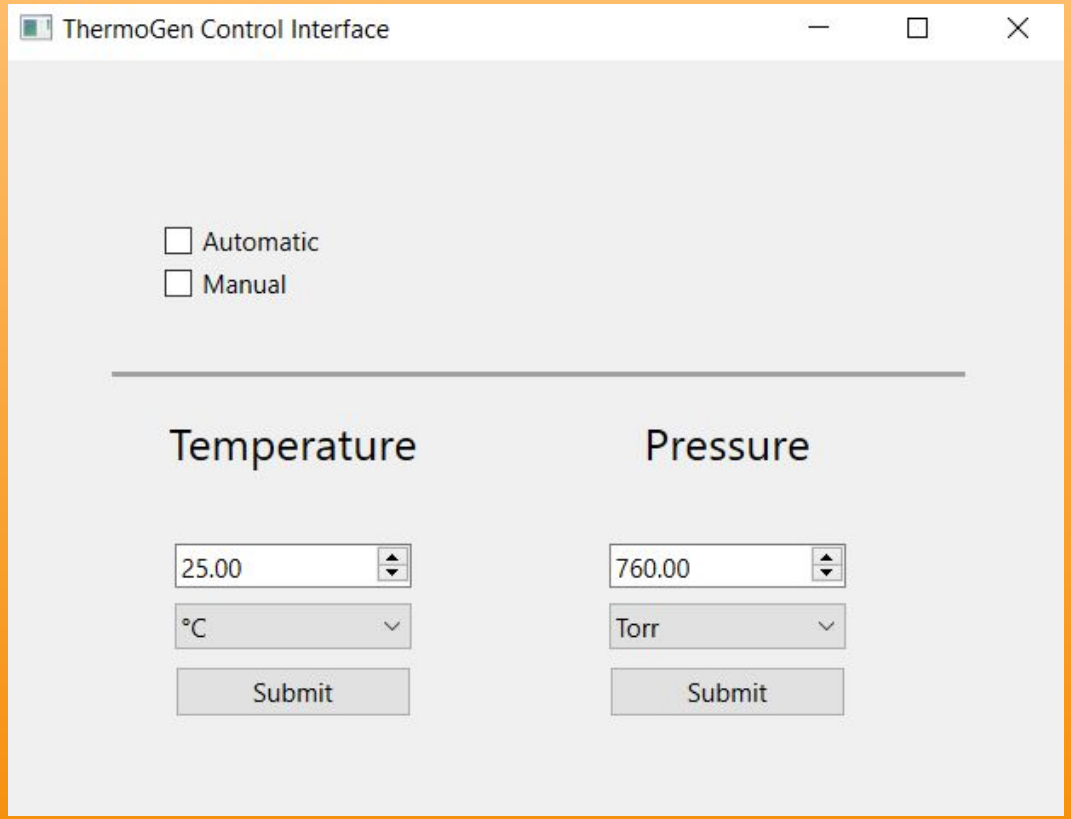
Architecture Review

- How did we design our architecture?
  - Analyzed client workflow and hardware constraints
  - Designed modules to allow both real hardware and simulation
  - Prioritized safety, modularity, and testability
- Key Architecture Components
  - User interface:
    - Allows operator to input target values, view live readings, and switch modes
  - Control logic:
    - Compares measured values against target values to determine adjustments
  - Temperature system:
    - Reads thermocouple data and outputs voltage to power supply
  - Pressure system:
    - Reads gauge data and changes state of valve
  - Notification system:
    - Sends alerts based on system state

Implementation Overview

- How did we got our requirements?
  - We interviewed our client, did research and reached out to other professors
- Key Requirements
  - Precise temperature and pressure control
  - Real time data monitoring
  - Minimize manual input
  - Clear notification system

Prototype Review



- This is the current interface
- Planned changes after client review:
  - Additional auto and manual controls
  - Thermocouple displays

Challenges and Resolutions

- The original parts were not compatible with automation
  - Ordered needed parts to automate the process
- The ordered parts did not work
  - Pivoted the project to simulation
- Simulating parts
  - Use existing libraries to simulate them

Testing Plan

Main Focus is Usability Testing in 3 Major Stages:

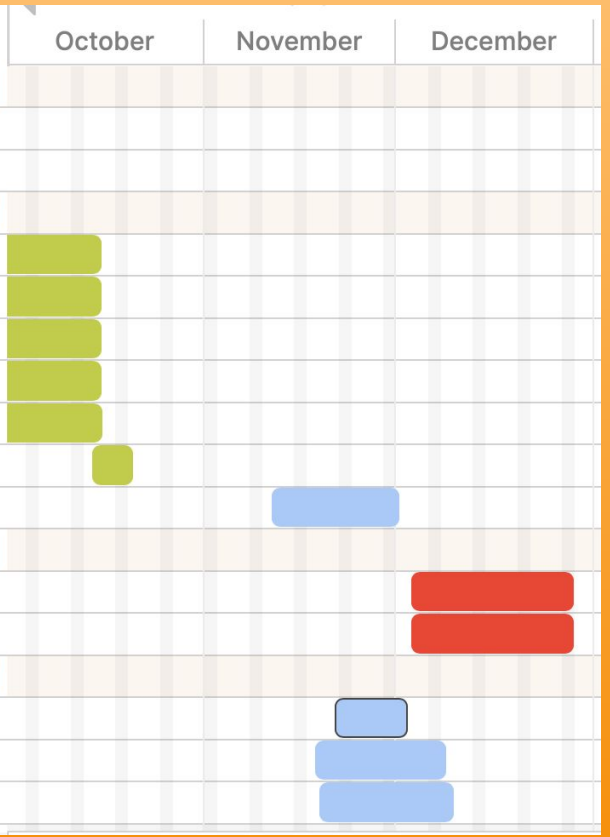
- Initial product test with client
- Follow-up product testing with client after making changes recommended in initial product test
- Final product test WITH user manual

Testing Plan Continued

- Additional testing for our product includes:
  - Unit tests for the 8 major functions that make up our application
  - And integration testing with client's system pending mechanical updates to their system

Schedule

	Activity
1	**Finalize required parts and specifications**
1.1	Finalize required parts and specifications
1.2	Conduct client review for parts approval
2	**Create tech model**
2.1	**Create tech model**
2.1.1	Temperature read & write
2.1.2	Pressure read & write
2.1.3	GUI & notifications
2.2	Integrate initial components for tech model into 1 system
2.3	Finalize design for tech model
2.4	Conduct internal review of tech model with client
3	**Integration with client's system**
3.1	Integration with client's system
3.2	Conduct client review of integration
4	**Finalize beta system configuration**
4.1	Finalize system configuration
4.2	Prepare documentation for final system
4.3	Complete project closure documentation



Conclusion

- Used in services from aerospace to emergency services and manufacturing
- Testing materials takes a long time
- Automating testing while still providing the same quality
  - Little user input
  - Accurate data
- Finalizing simulated parts, unit, integration, and usability testing.