

Digital ASIC Fabrication:

# Contextualization & Design Check-In

**Team 12**

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# Project Overview

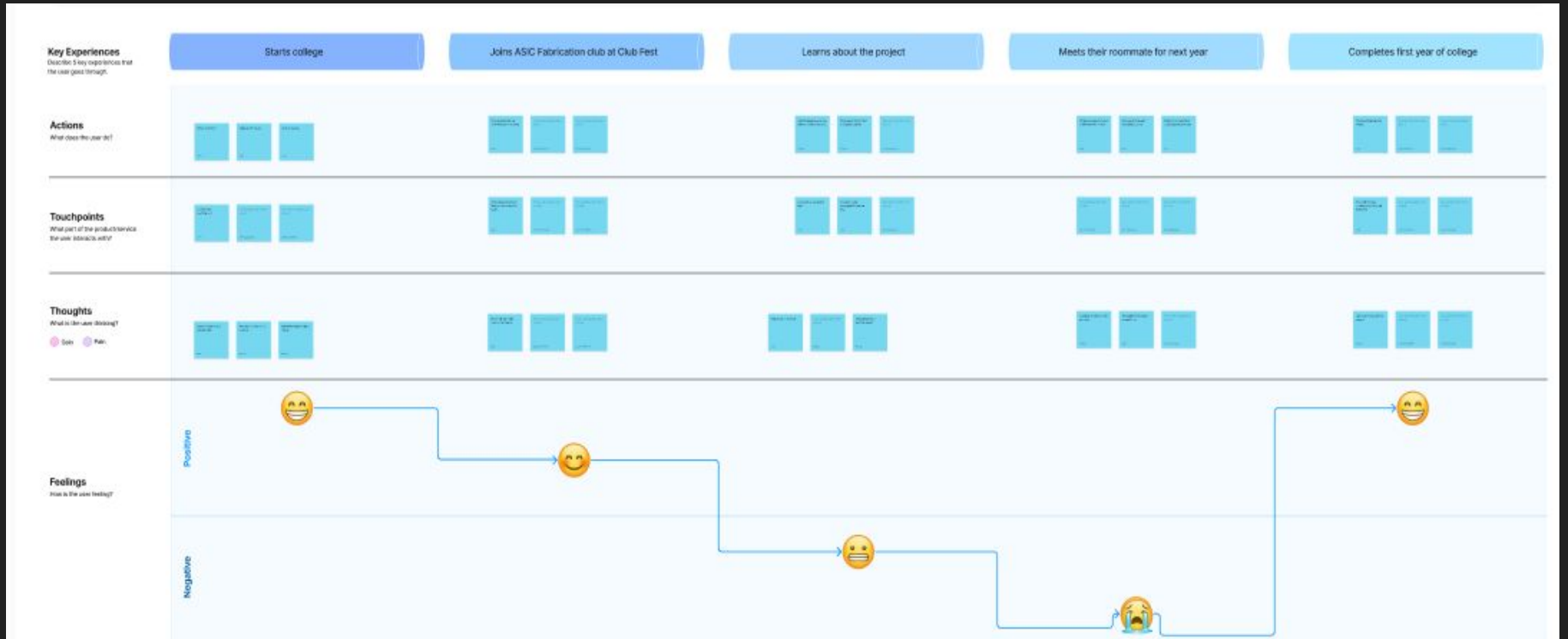
## **Problem Statement**

- Undergraduate students rarely get the opportunity to create a custom digital ASIC (Application Specific Integrated Circuit) and gain experience with chip fabrication.

## **Project Goals**

- Our project aims to give interested students experience in chip design and fabrication.
- We plan to build a chip framework that will hold small ASIC projects created by students in a co-curricular team.
- The chip framework will allow the students to have their designs fully implemented and synthesized.

# Journey Map



# Human

- Our solution will meet our user needs by allowing users to gain experience while using our framework with their own designs of ASIC projects.
- We will have a clear design document and instructions on how the framework works and what requirements the users projects must meet in order to work with our framework.
- This framework also will allow for future development of clubs and classes, as well as additional senior design teams to build off of what our team will have created.

# Market Research – Pros and Cons

	Alternative 1 - Contract Manufacturer	Alternative 2 - Mass Manufactured	Our Solution
Pros	Higher Quality, More Experienced Workers, More or less specific.,	Well-known, tested, and documented product, More user support, Easier and faster to get	Cheap, Designed for specific purposes.
Cons	Expensive, It takes longer to get,	Very general, More expensive than our solution,	Have to follow Caravel project constraints, Less background knowledge and experience,

# Economics

- Our solution solves a specific problem in a more detailed way that suits our users needs.
- Other companies produce things that take too long to good or are to broad and do not meet our user and client needs.
- Our solution is cheaper than hiring or buying a solution from an outside vendor.

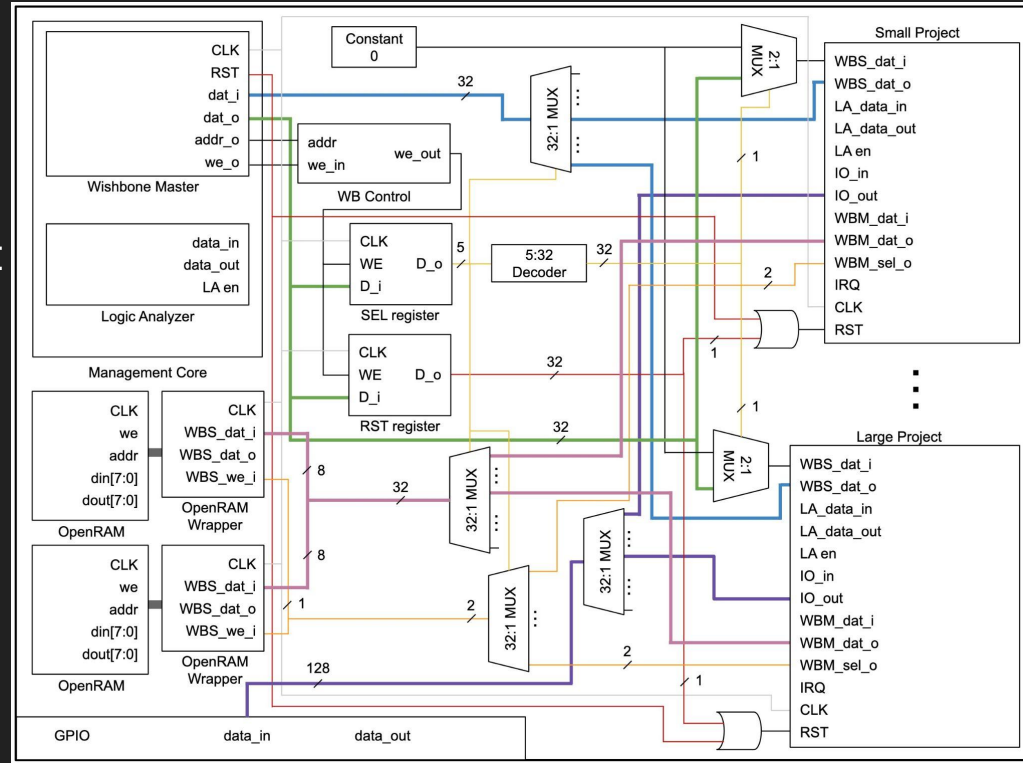
# Technical

## Internal Complexity

- Interconnected components
  - User projects, management core, OpenRAM
- Design considerations
  - Area, timing, power
- Communication protocols
  - Wishbone

## External Complexity

- Requires multiple open-source tools and frameworks



# Conclusion

We have developed a solid design as a team and are beginning to take action on implementing that design. Having previous teams experience and guidance we are able to work faster and meet earlier deadlines than some other teams may expect to make. We still need to develop a test plan which will most likely lead to further improvements and redesigning some parts of our framework.