Bite of Science
Honda R&D Americas, Inc.
Personal

- Anthony Alequin
- Chicago, IL
- B.S. in Human Factors Psychology, Embry Riddle Aeronautical University
- Research Engineer, Honda R&D
  - Previously a consultant in Columbus, OH and Chicago, IL
- Hobbies: Adventures, all things scary, figuring out how things work
- Interesting Fact: I may have one too many pairs of shoes
Personal

- Grade school was 97% Hispanic
- High school was 97% Caucasian
- Environment and ideas changed from city to suburbs
- High school = Awakening
  College = Growth
- Street smarts are valuable
- Recent graduate ≠ No experience
Personal

- Justin Sinaguinan
- Upper Saddle River, NJ
- B.S. in Mechanical Engineering, University of Virginia
- Engineer, Honda R&D
  - Previously interned at Mercedes-Benz USA and SAE International
- Hobbies: Auto Repair, Travel, Learning French
- Interesting Fact: I’m a Coffee Snob (Pizza too)
What We Do

• Develop the next generation of Honda and Acura vehicles for North America

• Research & Development
  • Advanced Product Planning
  • Specification and Creation
  • Validation and Testing

• A few vehicles include:
  • Honda Civic
  • Honda Odyssey
  • Acura RDX
  • Acura NSX
What We Do: Video

- [https://www.youtube.com/watch?v=ATlb9Xh9xgM](https://www.youtube.com/watch?v=ATlb9Xh9xgM)
What We Do

• Electrical Division
  • Electrical Infotainment—advancing in-vehicle experiences through technology
What We Do: Software Development

• Smartphone App Development
  • Previous projects involved navigation testing, voice-recognition, and emotional design

• Product Manager of Honda CabinControl
  • Led software development of feature
    • 3.5 year research and development project
    • Debuted on the 2018 Honda Odyssey

• Responsibilities included:
What We Do: Honda CabinControl Development

1. Finding strategic partners
2. Completing NDA and MSA
3. Clarifying Statement of Work
4. Completing POC
5. Identifying and targeting R-Elements
6. Teleconferences
7. Report to SVP to ask for $$$
8. Set schedule and plan
9. Set targets
10. Set budget and allocate accordingly (e.g. contract, travel, focus groups, surveys, testing, equipment, etc.)
11. Achieve goals by deadlines
12. Work weekends
13. Compile pool of research companies
14. Choose research company
15. Create test plan
16. Create screener
17. Set up data acquisition equipment
18. Anticipate issues
19. Moderate testing
20. Create survey
21. Record results
22. Analyze data and finalize conclusion
23. Report
24. Assess Development Cost
25. Request Approval from LPL to proceed
26. Request signature from President for contracts over $1 million
27. Travel... a lot
28. Confirm with Purchasing when each contract milestone is met
29. Correlate and collaborate with Function PCNs
30. Change specifications based on challenges encountered
31. Submit change requests to supplier if changes are out of scope
32. Collaborate and contemplate for solutions to each challenge
33. Ensure solutions meet requirements and are agreed upon by those affected
34. Work with AHM to create feature name
35. Submit specification revisions per milestone
36. HMI Design
37. Never give up
38. Assemble countless test benches many times
39. Make powerpoints to communicate ideas and reports
40. Review with Technical Evaluation Committee throughout development to meet requirements
41. Create App wireframe
42. Select company to run usability study
43. Create usability test plan
44. Define criteria to define successful usability
45. Define target user
46. Find and implement data acquisition software
47. Run usability test #1
48. Compile results
49. Analyze
50. Make fixes to app interface based on usability study
51. Re-do steps 41-50 to confirm fixes with usability test #2
52. Teach yourself how to use wireframing software
53. Work with design to create customer image
54. Product Regulatory Office Requirements
55. Ensure sufficient bugs are dependencies are minimized so that an Acceptance Test Plan can be run to assess progress
56. Continuously contact suppliers for bug fixes that affect your technology
57. Meet bug fixes by specific milestones or get cut from the vehicle
58. Assess root cause of each bug
59. Determine if bug fix is fully fixed or is a workaround that needs further long-term fixing
60. And....
What We Do: Product Creation

- Software product creation involves:
  - Usability Studies
    - Allows engineers the ability to see how users react to the technology
      - Strengths
      - Pain points
    - Key to making CabinControl app easy to use
What We Do: Human Factors

• Human Factors
  • 50% Engineering / 50% Psychology
  • Middle man between engineer and customer
  • Test design & Execution

• Interaction Research
  • Research and design ideal customer experiences

• Usability
  • Iterative design process
What We Do: Human Factors

How many passes?
STEM Skills to be Successful

1. Scientific method
   • Know how to test a hypothesis

2. Analysis
   • Work through data and make a conclusion

3. Statistics
   • Know the confidence in your conclusion

1. Problem solving
   • Recommend a solution if needed
STEM Skills to be Successful

• Problem-Solving
  • Always going to face unexpected challenges in product creation
    • The question boils down to what our solution is to overcome these challenges
  • Need to ensure that we know what variables we need to create that solution

\[ X + 15 = 33 \]

Solve for X

• Outside the classroom, an example can be:

A Senior Vice President expects a report of customer feedback for your prototype app by the end of next week. You have a prototype ready to demo in-vehicle with customers in a focus group tomorrow. During a routine sanity test, the prototype suddenly stops working. It’s 9 PM on a Friday, and all the engineers that can support are out of the office and won’t be back until Monday. What do you do?
What Can Teachers Do to Support?

• Demonstrations/experiments on concepts
• Give real life examples that actually happened
• Bring in relatable speakers
• Contact universities for their STEM student involvement
• Contact companies for tours and demos
• SHPE (Society of Hispanic Professional Engineers)
• HFES (Human Factors and Ergonomics Society)
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Questions?