

TUFTS ME43 PRESENTATION

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AGENDA

1.DEMO

2.LESSONS LEARNED

a)PLANNING

b)BUILDING

3.HOW I MADE THE LEAP

4.DISCUSSION OF PARTS/HANDS-ON

5.Q&A

BUILDING A HARDWARE PRODUCT



LESSONS LEARNED: PLANNING

- 1. CHOOSE WISELY ON A PRODUCT TO INVEST YOUR TIME & MONEY
(MUST HAVE A VIABLE BUSINESS MODEL 1ST)**
- 2. EVERYTHING TAKES LONGER AND COSTS MORE MONEY THAN ANTICIPATED
(BUT MANAGE TO THE AGGRESSIVE SCHEDULE)**
- 3. FINANCIAL MODELS AND BUDGETS SURVIVE FOR ABOUT A WEEK. BUILD THEM TO BE FLEXIBLE
AND KEEP THEM UP TO DATE.**
- 4. WORK WITH VERTICALLY INTEGRATED CM, LEVERAGE EXISTING RELATIONSHIP W/ CM TO
ESTABLISH YOURSELF (CM = CONTRACT MANUFACTURER)**
- 5. LEAD TIMES FOR ELECTRONIC COMPONENTS ARE CRAZY RIGHT NOW
(>90 WKS IN SOME CASES – GLOBAL SHORTAGE OF MULTILAYER CERAMIC CAPACITORS)**
- 6. PLAN FOR FEASIBILITY SCREENS FOR REGULATORY; MORE COMPLICATED = MORE TESTS**
- 7. BE VIGILANT IN KEEPING YOUR COGS ON TARGET – THE GRAVEYARD OF HARDWARE STARTUPS
THAT FAILED HERE IS CROWDED (READ UP ON JUICERO)**



LESSONS LEARNED: BUILDING STUFF

BETA PROTOTYPE	GAMMA PROTOTYPE	GAMMA DIAMOND PROTOTYPE	DELTA & EPSILON PROTOTYPE	PILOT UNITS	PRODUCTION UNITS
					
MAY- NOVEMBER 2013	DECEMBER 2013- MARCH 2014	APRIL- AUGUST 2014	SEPTEMBER 2014- OCTOBER 2015	NOVEMBER 2015- FEBRUARY 2016	MARCH 2016-

- BUILD ALL MANNER OF PROTOTYPES ALONG THE WAY (FROM THE SUPER CRUDE UP TO EXACT REPLICAS OF PRODUCTION PRODUCT - WE'VE ALWAYS LEARNED SOMETHING)**

LESSONS LEARNED: BUILDING STUFF

- 2. BREAK COMPLEX PROBLEMS INTO SMALLER ONES**
- 3. “IT’S JUST NOT DONE” - IF YOU’VE NEVER SEEN SOMETHING LIKE WHAT YOU’RE DESIGNING IN SOME OTHER CONSUMER PRODUCT - THERE’S A GOOD CHANCE IT’S NOT GOING TO WORK**
- 4. BEARINGS FIX A LOT OF MISTAKES IN MECHANICAL DESIGN... YOU DON’T WANT 20 BEARINGS IN YOUR PRODUCT (REMEMBER THE COGS BULLET EARLIER)**
- 5. COMPETITION AMONG DESIGNERS SOMETIMES BREEDS BETTER IDEAS - IF YOU CAN’T AGREE, COMPETE FOR IT**
- 6. IF STUFF ISN’T CATCHING ON FIRE YOU AREN’T TESTING HARD ENOUGH**
- 7. 3D PRINTING IS SUPER AFFORDABLE - COULD NOT IMAGINE DEVELOPING A MECHANICAL PRODUCT WITHOUT HAVING ONE IN-HOUSE**
- 8. CNC MACHINE (AND OTHER SHOP MACHINES) ALSO WORTH THE EXPENSE - ALTHOUGH WE USE IT FOR TWEAKING MORE THAN CREATING FROM SCRATCH (MANUAL CNC WOULD PROBABLY HAVE BEEN OK)**
- 9. CHINA IS WHERE IT’S AT FOR MOST PROTOTYPING - FAST AND CHEAP (ALTHOUGH YOU MUST PAY UPFRONT)**
- 10. EXTRUSIONS ARE MORE AFFORDABLE THAN YOU MIGHT THINK**
- 11. STAMPED SHEETMETAL IS EXPENSIVE... AND TIME CONSUMING (\$100K TOOL)**
- 12. ARDUINO MAKES PROTOTYPING BOARDS/CONTROLLERS FAST AND EASY. DON’T OVERTHINK IT!**
- 13. OUTSOURCED INTEGRATED ELECTRICAL/SOFTWARE DESIGN WAS (AND STILL IS) ONE OF THE BIGGEST CHALLENGES**



***TAKE SMALL STEPS...
MINIMIZE RISK & MAKE
PROGRESS***

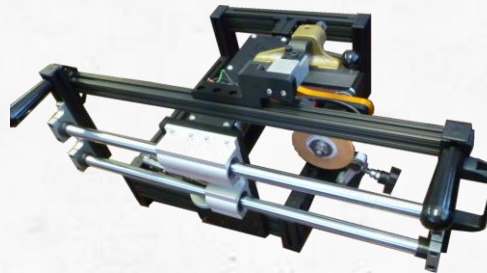
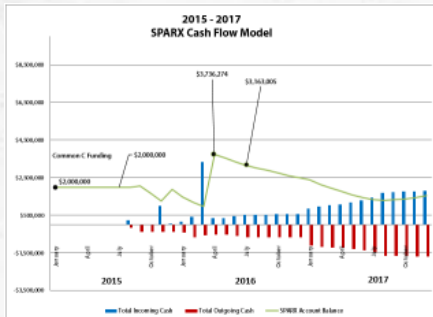


TAKE SMALL STEPS... MINIMIZE RISK & MAKE PROGRESS

KEEP DAY JOB

FULL TIME

key partners Component Manufacturers Contract Manufacturer Website Developer / Manager App Developer Our Customers! If it's built to show, it's built to grow.	key activities Mechanical Engineering Component Sourcing Industrial Design Electrical or App Engineering Branding/Viral Advertising key resources Patented/Trademarked Website / Online Content One-way products (great customers to attract for us) Supply Chain Mgmt Distribution	value proposition Portable, home-based skate sharpeners that are easy to use, precise, and affordable. The ability to have skates sharpened without needing to go to a skate shop. The luxury of sharp skates ALWAYS. Improved performance and confidence in any ice skating activity.	customer relationship Website (training/tips) User Forum Smart phone App Online/Phone Support distribution Charismatic Company Website Social Media/Viral USA Hockey Mag Google AdWords Corp. Office with Momentum for Distribution Future Retail (Hockey Dep't) Retail Sales	customer segment Segmented Customer Base Children - kids no parents for skate sharpening Young Adults - College students at the rink doing at home work 20 something - Adults out on their own, but with limited resources and time Hockey Parents - weekend warriors, some of whom play themselves Hockey as Retirement - 50+ Hockey crowd.
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MARKET DATA

POOL SAVINGS

MOONLIGHT/
HIRE INTERNS

BUILD PROTOTYPES

PROVE PRODUCT

BUILD PROTOTYPES

IDENTIFY MFG

VALIDATE W/ SALES

BUSINESS PLAN

FINANCIAL MODEL



STEP BY STEP

FULL TIME



FULFILLMENT PLAN

FINALIZE DESIGN

NEGOTIATE CMA

BUILD, ITERATE & TEST (EB, PP)

ECOMMERCE LAUNCH



MASS PRODUCTION

HIRE SALES



SCALE

COST REDUCTION

THANKS!

