TUFTS ME43 PRESENTATION

FALL © 2018 @ TUFTS UNIVERSITY

Russell Layton
CEO / Founder
russ@sparxhockey.com

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 FLEXBILE 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-

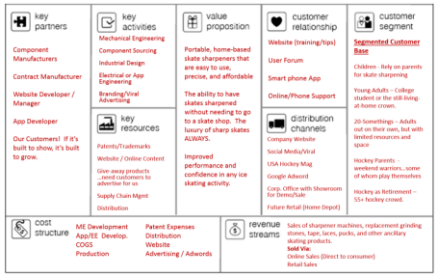
1. **BUILD ALL MANNER OF PROTOTYPES ALONG THE WAY (FROM THE SUPER CRUDE UP TO EXACT REPLICAS OF PRODUCTION PRODUCT – WE'VE ALWAYS LEARNED SOMETHING)**

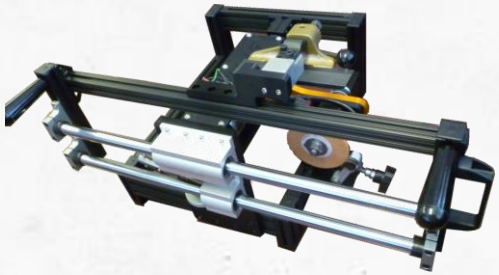
LESSONS LEARNED: BUILDING STUFF

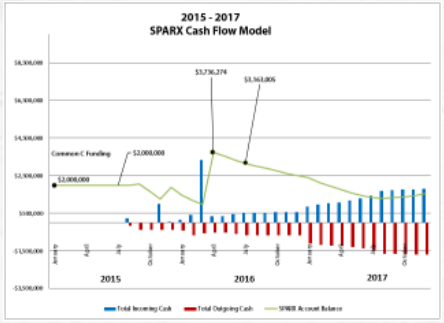
2. BREAK COMPLEX PROBLEMS INTO SMALLER ONES
3. "IT'S JUST NOT DONE" - IF YOU'VE NEVER SEEN SOMETHING LIKE WHAT YOU'RE DESIGNING IN SOME OTHER CONSUMER PRODUCT – THERE'S A GOOD CHANCE IT'S NOT GOING TO WORK
4. BEARINGS FIX A LOT OF MISTAKES IN MECHANICAL DESIGN… YOU DON'T WANT 20 BEARINGS IN YOUR PRODUCT (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 MECHANCIAL 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

KEEP DAY JOB → FULL TIME







- BUSINESS PLAN
- FINANCIAL MODEL
- MARKET DATA
- POOL SAVINGS
- MOONLIGHT/ HIRE INTERNS
- BUILD PROTOTYPES
- PROVE PRODUCT
- $
- BUILD PROTOTYPES
- IDENTIFY MFG
- VALIDATE W/ SALES
- $

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!