From Research to Company

One Start-up’s Story

Vaughn Betz
The Idea

- PhD: developed new software that:
  - Made it easier to design a certain type (FPGA) of computer chip
  - Lets you get more performance out of those computer chips
- 1998: getting commercial interest
- Turn this research software into a commercial product?
Field-Programmable Gate Arrays (FPGA)

- A pre-fabricated computer chip
- Can become any circuit by programming, in seconds
- Design a product: 2 months vs. 2+ years with trad. chip
- Costs $200 vs. $100 million with traditional chip
A Chip that Can change Its Spots
The Industry

- 2 big suppliers (Xilinx & Altera), 5 - 10 smaller players, and various start-ups
- Used in many different areas

FPGA Market 1995-2006

Source: Dataquest
Communications, Computer
Industrial, Video, Automotive
Consumer Applications

Set-Top Boxes

Touch Panels

DVD Players

Printers

Handheld Media Players

LCD, Plasma Displays/TVs

Consumer Music

Camcorders
Should We Commercialize?

- Interest from companies
- Me: risk-averse!
- Jonathan Rose (PhD advisor)
  - Energetic optimist: go for it!
- Mix was important!
- Commitment: start if we could find funding for real salaries
- Four founders, with mix of skills & personalities
  - Technical vs. business
  - Optimistic vs. pessimistic
  - Trust!
The Company

- Incorporated 1998
- Capital: $1000
Business Plan

- Jonathan: sell better software to FPGA users
  - Problem: FPGA users used to near free software
  - Problem: FPGA makers don’t give out details of their chips

- Me: sell straight to the vendors
  - Make better software for their chips
  - Help them make better chips
  - The money is in the chips!

- Went with my plan → key decision
  - Critique / war game your business plan
Funding

- Venture capitalist (San Jose)
  - Why not sell straight to FPGA users?
  - Wanted to repeat last success in a different area of CAD
  - Would force us into a business model I didn’t believe in

- Used bootstrap financing
  - Fund with pre-payments from FPGA vendors
  - **Good:** Ensures immediate customer contact ➔ build right thing
  - **Good:** Don’t dilute ownership
  - **Bad:** Will cut amount we can charge first customers
  - **Good:** Forces us to prove business plan viable at company start
University IP

- Needed to license CAD source code from university
  - University very reasonable
  - Wanted prestige / jobs / links of a start-up, not immediate $$
  - Our strength: university could not commercialize sw without us
Getting customers: Cypress

- **Spent 6 months negotiating with Cypress Semiconductor**
  - Big semiconductor company, but small ($30M / year) FPGA div.
  - Develop next generation chip and software for it
  - Very slow progress, no willingness to commit
Getting Customers: Altera

One day, Altera called

- Industry leader: > $1B / year in FPGAs
- Wanted better software for their current chips
- In 1.5 months had signed contract!
  - Much negotiation
- Money up front for office, computers, salaries
- Performance bonus
- **No Venture Capital required!**
Contract Issues

- Wanted legal advice, but grad student!
  - George Takach (McCarthy Tetrault) understood issues
    - Read quickly for big issues (cheap)
    - If no big issues and we’re close to signing read carefully ($$)
  - Get a good lawyer
    - George saved us many times
    - Needed him involved early, to prevent **big** mistakes
      - E.g. right of first refusal on acquisition
Intellectual Property (IP)

- Needed to own our IP (otherwise consultants)
- But selling core technology to FPGA vendors
  - They needed some control / ownership too
- Solution:
  - We own general IP
  - But they get *source code* & rights to extend
  - Major concession → customer can reverse-engineer
Success

- Delivered software to Altera
  - In 10 months
  - Maxed-out performance bonus
  - Altera replaced their SW with our prototype

- Negotiated further work
  - With much stronger hand

- Cypress also customer
Exit Strategy: Acquisition

- Altera made offer to buy
- Sell?
  - ✓ Sell at top of our game
  - ✓ To a top player with great engineers → impact
  - ✓ Industry consolidating → bad for our model
  - ✗ Lose control of your beautiful company and vision
- Acquired May 1, 2000 after much negotiation
  - Wrote unusual items to protect culture
Acquisition

- Altera Toronto Technology Centre
  - Grown to 140 people
  - Developed Altera’s most recent chip families and core software
  - Over $10 billion sold

- Key to keeping value
  - Altera basically let us run Toronto the way we wanted
  - Altera willing to replace own technology & re-deploy own teams
Acquisition Aftermath

Cypress sued Altera
- Wanted us to still develop their next-gen chip
- Altera said no (competitor)
  - Coke to develop Pepsi’s new soft drink?
- Small IP ambiguities in contract became important!
- Jokes in emails → hours with lawyers!
Lessons Learned

- Get close to your customers
- Focus – solve only what you need to
- It’s not price, it’s value!
- Negotiations: be prepared & patient

- Incredibly rewarding & memorable experience!