Confessions of a Serial Entrepreneur
or
30 years of Photonics Start-ups

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Telecoms Industry Structure

Bandwidth Consumers - Business, Homes

Bandwidth Deliverers – Telcos

Bandwidth Suppliers - Equipment Manufacturers
  • Eg Ciena, Cisco, Huawei, etc

Bandwidth Enablers - Component & Subsystem Manufacturers
  • Eg Finisar, Lumentum, Oclaro, etc

- PhD: Fabrication of Rare-Earth Doped Fibres
  - First Fibre Lasers and EDFA
  - Prof Sir David Payne

- York Technology
  - Manufacturer of test equipment for optical fibre manufacturing
  - Ed Kluth (CEO/Founder)

- York VSOP
  - Specialty Optical Fibre
  - Now known as Fibercore Limited

- Takeaway #1: Find a great role model/mentor

- Research start-up focusing on Applied R&D to support industry development
- Industry funded (Telecoms, Sensors)
- Additional Government funding (Australian Photonics CRC) from 1992
- During its lifetime, the OFTC
  - Published 300 papers
  - Filed 14 patents
  - Spun off 8 companies, starting with INDx
1995-2001 Bootstrap to bubble

- Manufacturer of Optical Fibre Bragg Gratings
- Secret Sauce = temperature-independent grating packaging
1995-2001

Bootstrap to bubble

- Started with a $10k loan in Sept 1995
- Sales of narrow-band filters to R&D Labs
- Undersea-cable – Sea-Me-We 3
  - Ultra-high reliability
Sea-Me-We3 Cable
1995-2001
Bootstrap to bubble

- Started with a $10k loan in Sept 1995
- Sales of narrow-band filters to R&D Labs
- Undersea-cable – Sea-Me-We 3
  - Ultra-high reliability
- Cash-flow crisis
- Acquired by Uniphase Corp for $A8m in Dec 1997
- Rapid Growth during telecom bubble
  - Wideband gain-flattening filters for undersea systems
  - Peak revenues of $US60mpa,
  - 330 staff in 2001
- Shut down in 2003
Takeaways

- Takeaway #1: Find a great mentor
- Takeaway #2: Listen to the market
- Takeaway #3: Incremental doesn’t cut it - Do things other companies can’t do by a factor of at least 10x
Intelligent Optical Subsystems for Reconfigurable Optical Networks
Market Focus: Reconfigurable Networks
  ‘Technology-free-zone’
VC funding
First product: Tunable Optical Filter
Successful Product: Wavelength Selective Switches (WSS) using a Liquid Crystal on Silicon (LCoS) platform
Wavelength Selective Switches (WSS) are the active switching elements inside a Reconfigurable Optical Add Drop Module (ROADM).
LCoS: Liquid Crystal on Silicon

- Developed in late 90’s for projection TV – overtaken by Plasma and LCD
- >$250M invested by major players to develop technology (Intel, Philips, LG, etc)
- Engana road coat-tails to acquire technology for ~$1M
- Provided platform for all Engana’s WSS with optical performance and functionality controlled by software
- Technology now adopted by other major WSS manufacturers
Engana
Founded
Series B, $A8m
Series A, $A6.3m
Acquired by Optium
Optium IPO
Finisar Merger

Optical Components Quarterly Revenues

Quarterly Sector Revenues ($US million)
Finisar Australia today

- Wholly owned subsidiary of Finisar Corporation (NASDAQ: FNSR)
  - Worlds largest manufacturer of components for optical network
  - 13,000 employees, Revenues ~$1.5bpa
- Finisar Australia is the largest manufacturer in the world of Wavelength Selective Switches with ~40% Market Share (Estimate)
- 100 % Export – US, EU, Japan, China
- >200 Employees in Sydney (design, manufacturing, sales & Marketing etc) + additional manufacturing in China
Engana/Finisar Takeaways

- Takeaway #1: Find a great mentor
- Takeaway #2: Listen to the market
- Takeaway #3: Incremental doesn’t cut it - Do things other companies can’t do by a factor of at least 10x
- Takeaway #4: It’s a team game, not a solo effort
Intrapreneuring: WaveShaper (2008 – present)

- Programmable Optical Processors
- Highly programmable optical test equipment for optical R&D and manufacturing test
- Core IP from Finisar Australia
- Applications know-how Sydney University (ARC Linkage Grant)

Launch Strategy:
1. Identify Opportunity
2. Get to market fast and iterate quickly…
WaveShaper: Hardware Evolution

E - Series, 2008-2009
Quick entry to market
Non-optimal design

S - Series, 2009-2016
Software codebase re-written
Improved performance
Simpler manufacturing

M - Series, 2010-present
OEM Version for third-party integration
Further reduction in total footprint

A - Series, 2016-present
Embedded Control Software
Ethernet Interface
Restful Programming Interface
WaveShaper: Software Evolution

Release 1.0
WaveShaper Control, 1106237-A00-02

Release 2.0
WaveManager Application Suite

Release 3.0
Web/HTML
WaveShaper Takeaways

◆ Takeaway #1: Find a great mentor

◆ Takeaway #2: Listen to the market

◆ Takeaway #3: Incremental doesn’t cut it - Do things other companies can’t do by a factor of at least 10x

◆ Takeaway #4: It’s a team game, not a solo effort

◆ Takeaway #5: Learn from your mistakes – quickly!
What matters in a Start-up?

There are only four things that matter:

1. Market: Will there be a market for your product when it’s ready?
2. People: Great team, hire slow, fire quick
3. Cash: Is really the only thing that really matters (Rule of $2^3$)
Most important thing?

Take time to smell the roses…
Thank you

WaveShaper
Programmable Optical Processors