

An Engineer in a Small Business or Start-up Environment

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IEEE Talk/Discussion

10/17/03

Don Bartlett - Bio

- Education: BSEE from Iowa State University
- 19 years experience in the semiconductor industry
- Work History
 - Burr Brown Corp
 - Analog Design Engineer
 - NCR / Symbios / LSI Logic
 - Analog Design Project Leader
 - Manager
 - Director
 - Chief Consulting Engineer
 - SiLutia
 - Founder / Technical Director
 - AMCC
 - Analog Design Manager
 - Greyrock Technology
 - Founder / President
- 25 issued or pending patents

Start-up #1: SiLutia Incorporated

- Founded
 - Early May 1999
 - Don Bartlett, Randy Zwetzig, Dan Curran, Gary Amato
- Fully self-funded by founders and operations
- High-Speed I/O Focus
- Established positive cash flow within ~4 months
- Created 13 local jobs within 1 year
- Sold to AMCC late September 2000
 - Established positive cash flow
 - >1/2 year capital reserves
 - Long-term revenue streams established through royalties
 - Revenue run rates > \$3M/year

Start-up #2: Greyrock Technology

- Founded
 - Late July 2003
 - Don Bartlett, Dan Curran, Steve Bassett
- Fully self-funded by founders and operations
- Analog-centric Design and Development Focus
- Established positive cash flow within ~3 months
- Created 4 local jobs to date
- Infrastructure and Design Systems
 - Capable of Design Starts w/in 6 weeks

Small Business vs Start-Up

- Small Business is not synonymous with Start-Up
- Small Business: Independently owned company less than 20 employees
- Start-Up: A business expanding at $>10\%$ per year
 - Growth flattens and becomes income-substitution, small business
 - Growth continues and becomes an opportunity-building business for stakeholders

Multiple Perspectives

- Starting or Joining a small business or a start-up
 - Business Models
 - Bootstrap
 - Venture Funded
 - Alternative Investors
 - Starting your own business
 - Motivations
 - Should I start a business?
 - Likelihood of Success
 - Commitments
 - Risk
- Working in small or start-up businesses
 - Advantages / Disadvantages
 - Pay and Benefits
 - Personal Traits for Success

Business Models - Bootstrap

- Fully self-funded
 - Initial Investments and subsequent capital calls
 - Services, Consulting
 - Maintain control and ownership
- Services/Consulting vs Products Company
 - Bootstrap methods work well for services – you probably become a small company
 - Bootstrapping yourself to a products company much more difficult
 - Are the days of the garage entrepreneur over?
 - Cost of semiconductor products too high
 - Tools costs, even for board products high
 - Sales and Distribution Channels difficult to build
- “Time is Money” – Only when someone is willing to pay you for your time!
 - Often more time than money, easy to justify learning and implementing new things
 - Need to understand inefficiencies of learning and implementing infrastructure versus contracting it out
- After the “real work” begins
 - Usually not cost effective to do it all yourself
 - You have someone willing to pay you money for what you’re good at
 - Pay could be direct, could be from venture capital, could be from other sources – all have certain expectations based on their investments

Business Models – Venture Capital

- What you need?
 - More than an idea
 - Execution and Management Teams
 - Experienced in other companies
 - Experienced in other start-ups
- Venture Capital – Initial Stages
 - Seed Funding \$100k-\$300k
 - Marketing and execution plans
 - Some level of prototype
 - Expect you to have “skin in the game”
 - Start-up Funding
 - Proof-of-concept complete
 - Scale to build first product
 - 1st Stage Funding
 - Drive toward production
- Benefits of Venture Funding
 - Contacts in the industry
 - Experienced Entrepreneurs
 - \$
- Disadvantages of Venture Funding
 - Loss of control
 - Dilution of ownership

Business Models – Alternative Funding Options

- FFF (Family, Friends, and Fools)
 - Needs to be managed carefully, SEC has restrictions on investors
 - Complicated, financially, personally, and professionally
 - Loss of ownership, but probably less than with Venture money
 - Usually able to maintain the same level of control
 - Not much help with contacts or business consulting
- Angel Investors
 - Limits number of investors
 - Loss of ownership and control
 - May not be much help with contacts or business consulting

Starting a Business

- What motivates people to start a business?
- Should I start a business?
 - Understand the impact
 - Prepare
- Likelihood-of-Success Indicators
- Commitments
 - Financial
 - Time
 - Others Livelihood
- Risk Management
 - Financial
 - Professional

Motivations - Top Reasons for Starting a Business

- | | |
|--------------------------|------|
| 1. Autonomy | ~30% |
| 2. Income/Wealth | ~20% |
| 3. The Challenge | ~13% |
| 4. To pursue an idea | ~8% |
| 5. Better utilize skills | ~7% |
| 6. No better Alternative | ~5% |
| 7. Other | ~17% |

* Source: *Engineering Your Startup* by Michael Baird

What Motivated Me?

- Autonomy – The desire to work for myself and control my own destiny
- Better Utilize Skills – desire to utilize a broader range of skills
 - Design/Development
 - Customer Interaction
 - Business Management
- The Challenge – Could I do this? I always wanted to know
- This time, not many alternatives

Should You Start a Business?

- Impact to Personal Life
 - Alignment to life goals
 - Self worth/esteem
 - Family
 - Financial
 - Legacy
 - Quality of Life
 - Family
 - Work
 - Other Interests
- Preparation
 - Financial
 - Health
 - Relationships

Impact to Me and My Family

- Life Goals
 - Still able to extract self worth/esteem from work and family
 - Thought this may be a way to build something that was a contribution to the community
 - Wasn't sure whether long-term financial goals could be met
- Quality of Life
 - Working from home wasn't a good answer
 - We had to adjust to a reduced financial situation
- Preparation
 - Financial
 - Had a path to eliminate all debt and minimize living expenses
 - Had saved \$
 - Health
 - I worked to ensure this wouldn't be an issue
 - Had a thorough exam to be on the safe side
 - Relationships
 - Is your spouse ready for this? My wife and family were very supporting
 - We were open with our children on what we were doing and the impact that they might see.

Success Indicators

- ✓ Always had a desire to own or start a business or owned a business in the past
- ✓ Had a self employed father or mother
- ✓ Have a 4-year technical degree or a masters degree in a technical field
- ✓ Think you can do a better job at ...
- ✓ Independent by nature
- ✓ Moderate need for power and low need for affiliation
- ✓ >10 years work experience
- ✓ Have published more papers or patents than colleagues
- ✓ Work has been focused on applied development not research
- ✓ Have risen to a management position in career
- ✓ Modest emphasis on financial reward
- ✓ More extroverted than peers, but considered an introvert compared to the rest of the population
- ✓ Have always felt challenged and satisfied during career
- ✓ Tend to read management and business books as often as engineering technical books

My Success Indicators

- My father owned a small business
- 4 of my siblings own(ed), or partially own, businesses
- Planned to start a business at 40 – previous employment satisfied many of the entrepreneurial desires
- Money is helpful, but I never made that the focus of my life or career
- I matched up favorably with many of the other checks

Success Indicators

- Matching or not matching the list of success indicators is not a guarantee of the success or failure of your company
- It's a probabilistic function – matching more of the indicators improves the probability
- The Success Indicators may be correlated, but I'm sure not all are causal

Commitments

- Financial - Must commit enough resources to the business to be successful
 - Initial investment, SW, HW, Equipment, Furniture
 - Work without pay
 - Future capital calls, same level of capital as first investment 6 months to 12 months out.
- Time
 - 55-80 hour work weeks
- Responsibility for Others- Your first employee
 - They expect to get paid
 - They expect to have some longevity in the job
 - They should understand the risks and rewards

My Commitments

- Financial
 - Put up sizable initial capital
 - Worked for 1.5 years without pay
- Time
 - Worked at least 60 hours a week – but I generally did this prior as well.
 - One stretch I worked 14-16 hour days for about 5 weeks in a row, we did take some time off on Sundays
 - I Did get a vacation into the second year, I built a demo board while taking the week “off”.
 - Didn’t plant my garden for two years in a rows
 - Leveraged time where I could
- Responsibility for Others
 - The first hire was one of the more frightening experiences
 - The burden of being responsibility for someone else’s situation is stressful – you worry about your own affairs as well as others.

Risk Management

- Financial
 - Have an alternative plan – what happens if the business fails?
 - Change your lifestyle
- Personal / Professional
 - Don't stop learning – easily done when you're one of the primaries within the company
 - Keep contacts active
 - Retain new skills required in a small business

How I Managed Risk

- Financial
 - A backup plan that would put us in a debt-free position
 - Changed our lifestyle
 - Fewer meals out, movies, etc.
 - Looked for cheaper alternatives for entertainment
 - Cut vacations
- Professional
 - Continued learning at home and on the job
 - Position forced me to learn, more than I ever cared to know in some cases, about numerous topics
 - Kept contacts open
 - Previous work associates
 - Previous customers
 - New associates

Working in Small or Startup Businesses

- Advantages / Disadvantages
 - As with any situation there are advantages and disadvantages
 - Each of us will have our own perspective on what's an advantage versus a disadvantage
- Evaluating Opportunities at Small or Startup Businesses
- Pay and Benefits
- Personal Traits for Success
 - Traits for a smaller environment
- Time versus Money
 - Making trade-offs between time and money
 - Each employee is responsible for these trade-offs

Advantages / Disadvantages

- Clear connection between effort and company outcomes
- Exposure to many aspects of the business
- Contribution in more areas
- Opportunity to do learn and do other things
- Few Politics, less rigid hierarchy
- Potential financial gain
- Everyone easily aligned to strategic outcomes – “see the big picture”
- “Working without a net” - less support from others
- More emphasis on the individual’s performance
- Potentially less diverse environment
- Perception that it’s less stable
- Lack of infrastructure
- Lack of formal training / educational opportunities
- Less social opportunity

Evaluating Opportunities at Small or Startup Businesses

- The People
 - Likelihood of success
 - Match to success criteria
 - Previous experience in small/startups or pas jobs
 - Motivations for doing what they're doing
 - Industry Connections
 - Compatibility with others within the business
- The Company
 - Objectives
 - Small business versus Startup
 - Strategic Plan
- Evaluation Criteria
 - Personalize it – what's important to you
 - Talk with others already in a similar situation

Pay & Benefits / Work Environment

A SiLutia/Greyrock Perspective

- Competitive Pay and Benefits
 - We generally matched or exceeded individual's pay when hired
 - We attempted to match total \$ expenditures for benefits
 - Bonus Plans established for everyone based on company objectives
 - Stock Option availability for everyone joining company (Greyrock has significantly modified the SiLutia Stock Option Plan)
- Work Environment
 - Individuals required to understand more aspects of the business, Net Admin, Marketing/Sales, Application, etc.
 - Open atmosphere
 - Flexibility

Start-Up Traits for Success

- Generally, start-up companies are looking for similar traits in individuals as large companies – The ingredients are all the same, just the amounts change.
- Typical Behavioral Dimensions
 - Technical Competence
 - Attention-to-Detail
 - Initiative
 - Motivation
 - Respect for Others

Key Behavioral Dimensions

- Technical Competence
 - Thorough technical background
 - Ability and desire to learn new things - quickly
 - Ability to quickly understand issues
- Attention-to-Detail
 - Confidence in ability to define the important details
 - Development of criteria for determining importance of each detail
- Initiative
 - Look for ways to improve the overall efficiency and effectiveness
 - Propose and develop new and improved ways
- Motivation
 - Need to be self motivated – not someone looking over your shoulder
 - Alignment of motivation with company outcomes
- Respect for Others
 - Can't afford to have people not working closely with each other and respecting each others abilities
 - Must extend beyond local environment to vendors, customers and community