

**Being an Engineering Consultant:
What Does It Take?**

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See <http://www.hasys.com/tutorials/> for charts

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Outline

- Overview of Our Start
 - Goals
 - Timeline
 - Lessons Learned
- Business of Consulting
 - Getting Clients
 - Networking
 - Pricing
- Should I Do It?

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Define Your Goals in Starting Business

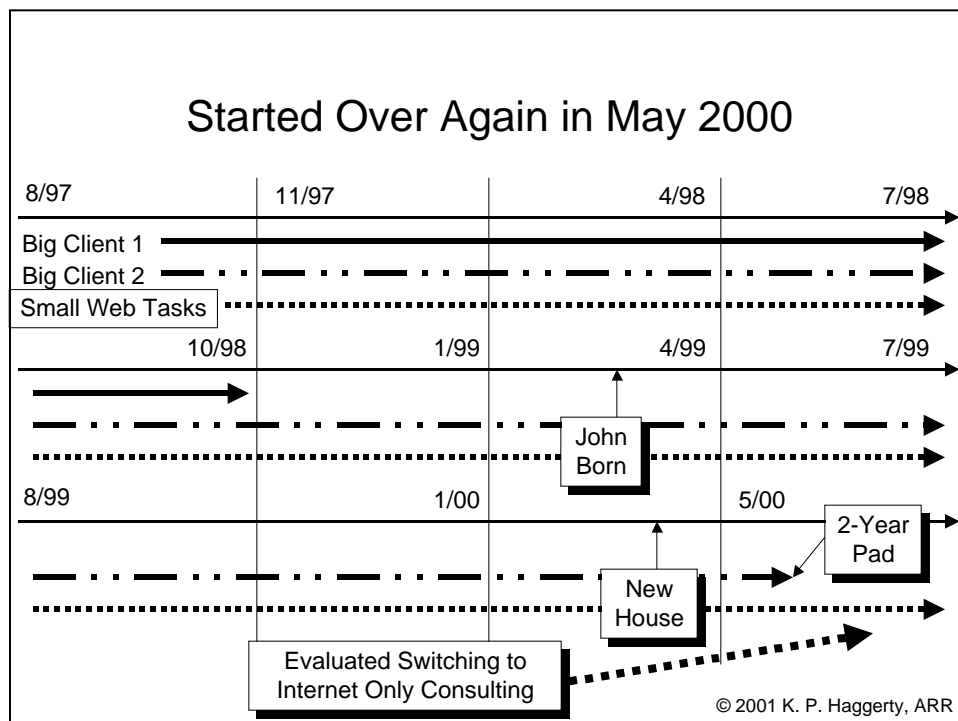
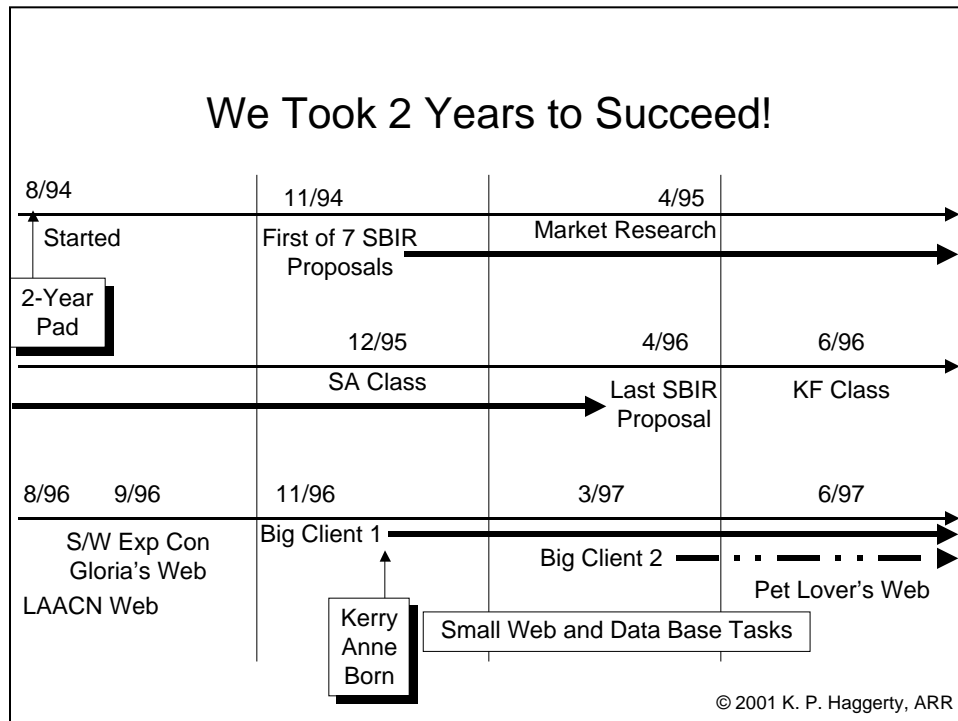
- Most Significant Choice: Independent vs. Job Shop
- Our Goals
 - Run Own Business (Independent)
 - Want Mathematica - Buy It
 - Freedom from Antiperks of Employment (e.g. "Ethics" Training)
 - Leslie: Maintain Skills While Focusing on Being a Mom
 - Best Life/Disability Insurance on "Bread Winner"
 - Makes Support of Multiple Clients Easier
 - More Presence at Home for Me
 - Trade Lowered Income for Family Time (Unpaid Time Off)
 - Spend Break Time with my Children

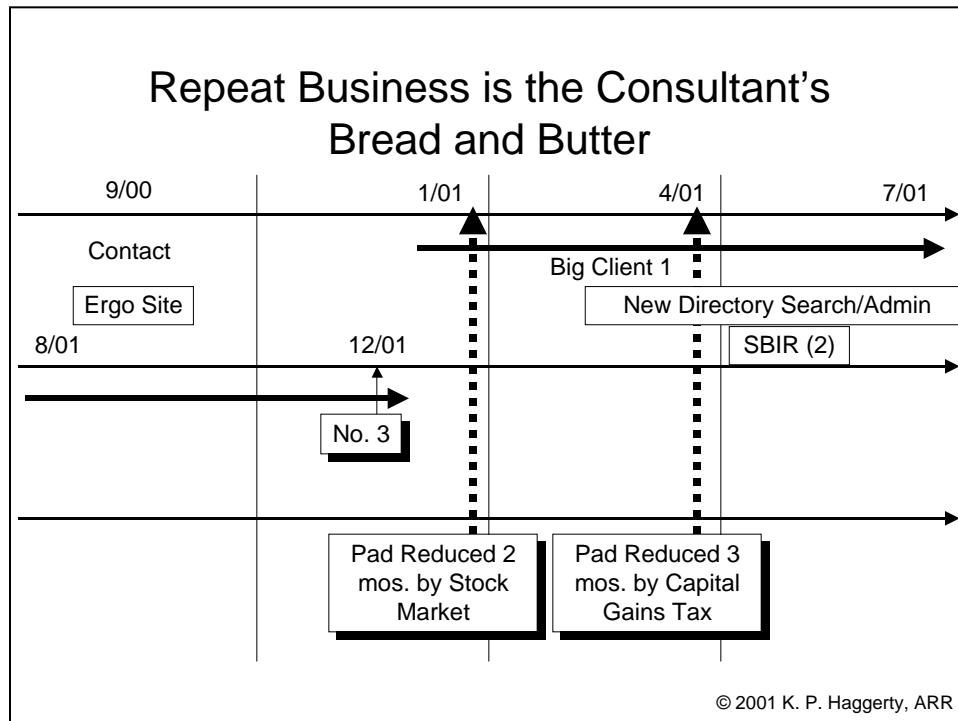
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Our Starting Vision: Provide Systems Engineering to Small Companies

- Did Market Research after Starting
 - Technique for Making Contact with Decision Makers
 - Learned They Didn't Want What We Were Selling
- Tried SBIR
- Mid Size Companies Look Good
 - Large Enough to Afford Outside Consulting
 - Nimble Enough to Take Advantage of Consultants
- Shifting Our Focus to More Tangible Services
 - Control Systems
 - Radar
 - Web CGI Scripting
 - etc.

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Lessons Learned

- Market Research on Small Businesses (< 500)
 - Turn Around Too Short
 - Don't Like Consultants
 - Only Want Tangible Well-Defined Services
 - Prefer Fixed Price Contracts
- Niche Skills Sell More Easily
 - Reliability Analysis
 - NT Network Management
 - Microwave Filter Design
 - Windows C++ (esp. GUI)
 - etc.
- SBIR
 - Waste of Time
 - They Want Successful Large Small Businesses
- "Quitting" Money is Critical
 - Success Takes Longer than You Think
 - Need to Look Like Business
 - Real Business Cards
 - Separate Phone Lines
 - Good Computers, Software Tools, and Internet Access
- **Warning:** Pretending is More Fun than Succeeding

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The Fundamental Cycle of Consulting

- A. Get Clients
- B. Perform on Contracts
- C. Go To Step A

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Most Clients Come From People You Know

- 1. Clients You Know
 - Previous Clients
 - Former Colleagues
 - Number 1 Path to Engagements
- 2. Referrals from Fellow Consultants
 - Distant Second
- 3. Referral Mechanisms
 - Directories
 - Referral Lines
 - etc.
 - Even More Distant Third

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Our Clients Are Mostly Due to Personal Contacts

- Started with Vision and Goals
 - Virtually No Income for 2 Years
 - SA Class for Former Employer (Became a Repeat Big Client)
 - KF Class Due to Referral by Former Coworker
 - S/W Expert Consulting Due to Referral by Fellow Consultant
- Met Engineer in Mid Sized Company Through IEEE
 - He Found My Listing in LAACN Web Directory
 - Requested We Meet with His Management
 - Became a Big Client
 - Anticipating Repeat Business

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Networking Is Exchanging Info to Build Relationships and Help Each Other

- Three Key Steps
 - Find Common Interests
 - Participate in 3 Organizations
 - Act like a Host at Gatherings
- Where to Go
 - IEEE Meetings
 - Alumni Groups
 - Political Organizations
 - Charitable/Religious Organizations
- Develop a Talk and Give it at a Meeting

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Volunteer Activities Can Lead to Engagements

- Leslie Has Added Web Work to Our Offering
- Skills Developed on Pro Bono Work
 - Search Engine for LAACN Directory
 - Shopping Cart Script for Nonprofit Organization
- Met Web Provider Through Volunteer Activities
 - He Wanted Someone He Could Trust with Root Access to Do Scripting for His Customers
 - Referrals for Two Fixed Price Web Site Set-ups
 - Numerous Referrals for Perl CGI Scripts

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Pricing Models and Surveys Help You Set Your Fee

- Simple Model
 - 2 to 3 times Desired/Last Salary
- Business Model
 - Total Annual Costs over Annual Billable Hours
 - Costs Include:
 - Time Off and Benefits (including Employers part of FICA)
 - Overhead Time and Expenses
 - Excel 98 Spreadsheet on <www.hasys.com/tutorials/>
- Value Model
 - Fixed Price
 - Based on Value to Client, Not Hours of Work
 - Hard to Do

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Summary of Fee Surveys for Independent Consultants

- Average Rate in 1999-2000: \$100/billable hour
 - Assume Average of 25 Billable Hours per Week Best Case
- Special Qualifications: \$150/hour and higher
- Rates Tend to be Above Average for:
 - P.E.
 - Advanced Degree
 - Expert Witness
 - High Demand Specialties
- Note: Rates for Job Shops Significantly Lower
 - Model is Salary Plus Cash in Place of Some Benefits
 - About 25% to 35% over Salary

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Consulting Has Disadvantages as Well as Advantages

- | Advantages | Disadvantages |
|-------------------------------|-----------------------|
| • Potential for Higher Income | • Risk |
| • Independence | • Uncertain Income |
| • Creative Freedom | • Responsibility |
| • Pride in Accomplishment | • Effort |
| | • Investment |
| | • Lack of Flexibility |

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Do I Have the Personality of an Independent Consultant?

- Self-Starter
- Like Other People
- Leadership Ability
- Responsible
- Organized
- Hard Worker
- Decisive
- Trustworthy
- Persistent
- Healthy
- Energetic
- Students, Before Starting:
 - Get 5-10 Years Experience
 - Get P.E. License
 - Consider Advanced Degree

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Should I Do It?

- Yes, If ...
 - Have a Salable Skill
 - Have Experience
 - Have Sufficient Financial Reserves to Survive Start-up
 - Have the Personality to Succeed
 - Willing to Take the Risk
 - And ... Have an Exit Plan (When to Accept Failure and Quit)
- Otherwise, No
- Last Note: Get Your P.E. License/Registration

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