Keeping Your Job Onshore

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From: erp sales <noreply@bluelancer.com>
To: dsaks@wittenberg.edu
Date: Sep 04, 2004 6:01 am
Subject: SPAM: Top Quality Software Engineers at 1/2 Price

Top Quality Chinese Software Engineers work for
you at 1/2 of Market Price - Cut Your $10000 IT
Project Down to as little as $3000
- Guru Experience in ERP Applications - Ask demos and
  sample code - Such as:
  - Marketing and E-commerce Automation
  - Enterprise Accounting and Automatic Billing Systems
  - Diverse Customized Business Software Solutions
  - and more...
- Complete range of custom business software solutions at
  guaranteed 1/2 Market Price
- Customize your business ERP application to tailor to your
  company's special need

The Trend Toward Offshoring

- How real is it?
- It depends on whom you ask...

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The Trend Toward Offshoring

- Guesstimates of US jobs lost to outsourcing[†]:
    - 300,000 - 500,000 from Mar '01 to Mar '04 (Goldman Sachs)
    - 400,000 - 500,000 "over the last few years" (Business Week)
    - 995,000 from Mar '01 to Oct '03 (economy.com)
- BTW, the US labor force is 140 million jobs.

[†] "Outsourcing Statistics in Perspective", *www.americanprogress.org*, March 16, 2004

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The Trend Toward Offshoring

- Forrester Research estimated the number of US service-sector jobs that will move offshore (including those lost already)[†]:
  - 830,000 by the end of 2005.
  - 3.4 million by the end of 2015.
- These numbers include all service-sector jobs, not just those in high tech.

[†] Rachel Konrad, "Offshore job use quickens", *Detroit Free Press*, May 24, 2004.

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The Trend Toward Offshoring

- According to a June 2004 report from the Bureau of Labor Statistics[†]:
  - Only 2% (4,633 of 239,361) jobs lost in 2004 Q1 went to workers outside the US.
  - Another 4% were lost to relocations within the US.

[†] Jim Ericson, "Offshore Job Losses Small", *Line56.com*, June 11, 2004
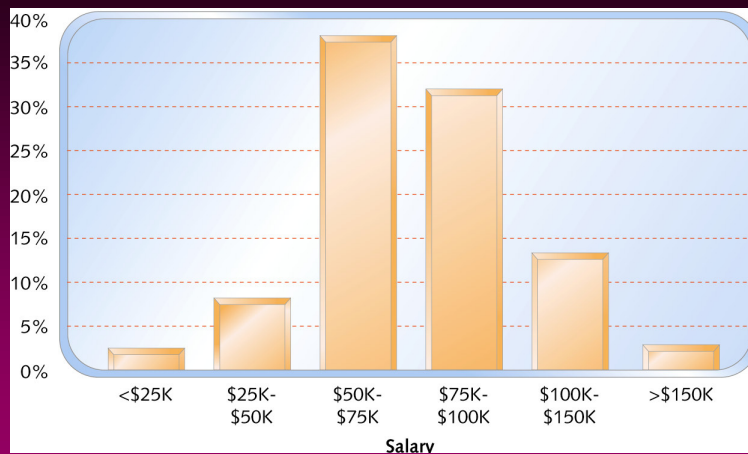
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The Trend Toward Offshoring

- Isolating the white-collar jobs lost to outsourcing from those lost to other factors is very difficult.
- Isolating the high tech jobs lost is even harder.
- Isolating the embedded development jobs lost is nearly impossible.

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US Embedded Developer Salaries[†]

[†] Merlina Trevino, "Embedded Salary Survey", *Embedded Systems Programming*, Nov. 2000.

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US Embedded Developer Salaries

- The median was $75,000.
- These numbers exclude bonuses and benefits.
- Of course, salaries vary by region.
- Although this salary data is 4 years old, salaries have remained pretty flat since then.
  - They may have started turning upward.
- This data doesn't differ much from what you'll find at job search websites such as *Monster.com* and *PayScale.com*.

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Offshore Salaries

- Annual salaries for programmers and engineers in India appear to range from $5K to $20K.
- Does this mean you can hire an Indian developer for $\frac{1}{5}$ or $\frac{1}{6}$ the wages of an American developer?
- I don't think so...

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Offshore Salaries

- Other cost factors offset the savings:
  - Distance
  - Time
  - Language
  - Culture

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A Case Study

- BusinessWeek[†] told the story of an entrepreneur who needed 4 programmers to staff a project.
- He estimated that each programmer would cost $85,000/year in the US vs. $40,000/year in India.
- He advertised for programmers in the US at $45,000/year, and got 90 applicants for 4 positions.
- He later promoted 2 of the 4 to positions at more typical US salaries.

[†] David E. Gumpert, "U.S. Programmers at Overseas Salaries", *www.businessweek.com*, Dec. 2, 2003.

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My Best Guess

- When comparing the true cost for software developers in the US vs. those offshore, we're talking about ratios of 2:1 or maybe 3:1.
- That is, offshore outsourcing for software development might reduce costs by $^1/_2$, possibly by $^2/_3$, but no more.

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Whatever the Numbers...

- The world is a big place, getting more competitive all the time.
- Developers overseas are eager for the opportunity to work, and they're willing to work at much lower wages than you are.
- Even if they aren't taking many US jobs now, they're going to keep trying.
- What do you do?

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Political Strategies

- Oppose free trade?
  - Advice: Don't thumb wrestle with the "invisible hand".
- Support changes to corporate taxes to discourage outsourcing?
  - If you don't know anything about this, start by reading Robert J. Samuelson, "Keeping U.S. Jobs at Home", *The Washington Post*, April 28, 2004.

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Economic Strategies

- Choose work that's less likely to be outsourced.
- Specialize in work where there's less competition.
  - In a sense, that's what I did.
- Face the competition and grab your piece of the pie.

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Outsourcing Factors

- Spafford discussed factors that encourage or discourage outsourcing:[†]
  - Confidentiality: Work that deals with confidential information is less likely to be outsourced.
  - Compartmentalization: Work that can be partitioned into discrete steps is more likely to be outsourced.

[†] George Spafford, "Is Your Job at Risk of Being Outsourced?", *itmanagement.earthweb.com*, February 19, 2004.

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Compete? How?

- You can compete on:
  - Price
  - Productivity
  - Quality
- In other words, you can try to be:
  - the cheapest
  - the fastest
  - the best

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Compete? How?

- Clearly, you don't want to be the cheapest.
- In that case, you're going to have be:
  - Faster
  - Better
  - or some distinctive combination thereof
- How doable is this?

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Programmer Productivity

- "Within just this group [of experienced programmers] the ratios between the best and worst performances averaged about 10:1 on productivity measurements and an amazing 5:1 on program speed and space measurements. ... The data showed no correlation between experience and performance. (I doubt if this is universally true.)"

  – Fred Brooks, *The Mythical Man Month*. Addison-Wesley, 1975, citing the 1968 work of Sackman, Erikson and Grant.

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Programmer Productivity

- By the way, the median wasn't here:

  1   2   3   4   5   6   7   8   9   10
                          ^

- It was around here:

  1   2   3   4   5   6   7   8   9   10
                 ^

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Programmer Productivity

- "… statistics over a 12-year period show a 200:1 variation between the top programmer and the poorest programmers."
  - G. E. Bryan, "Not all programmers are created equal", *1994 IEEE Aerospace Applications Conference Proceedings*, Los Angeles, IEEE.

- By the way, of nearly 200 programmers on the job:
  - One programmer did 8% of the work.
  - The top 27% did 78% of the work.

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The Bottom Line

- If you want to cost 2 to 3 times what an offshore programmer costs, you're going to have to provide 2 to 3 times the value.
- How?
- Pardon me while I spend a few minutes as a self-help guru…

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Is This Really What You Want to Do?

- You're going to have to put in some extra effort.
- If your heart isn't in it:
  - It's gonna be a drag.
  - You'll hurt your chances of success.
- Before you start, make sure this is work you really like to do.
- If not, do something else.

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One Route to Success

- Ask people who seem to be successful doing something you might like to do how they got to be where they are.
  - Some will blow you off.
    - Just go on to the next one.
  - Many will be gratified that you asked, and be delighted to talk to you.
    - Listen carefully.

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When I Took that Route...

- I was struck by the number of people who told me they were guided, not by a business plan, but by a desire to do what they liked and avoid what they didn't like.
- My wife, bless her heart, bought me this book:
  - Marsha Sinetar, *Do What You Love, The Money Will Follow: Discovering Your Right Livelihood.* DTP, 1989.

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Self-Help Books?

- "You're kidding. Right?"
- "No, I'm not."
- Expect to sample a bunch of books before you find one that hits home.
- Another book to consider is:
  - Phillip C. McGraw, *Self Matters: Creating Your Life from the Inside Out*. Simon & Schuster, 2001.
  - Yes, Dr. Phil.

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Things to Consider

- Is there anything about this business (embedded systems development) that you find particularly exciting? Distasteful?
- Do you want to be a generalist or a specialist?
- Do you prefer working with high-level concepts or details?
- Are you better at roughing things out or polishing them?

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Self-Employment?

- I love it, but it's not for everyone.
- In fact, it's probably not for most people.
- Consider how you feel about:
  - Handling the business side of things
  - Financial uncertainty
  - Working alone
  - Travelling
- If you don't think you have the self-discipline, then you don't "get it" — go hit the books.

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There's no "I" in "Team"

- If you prefer to be an employee, make sure you work for a manager who:
  - appreciates how good you are
  - encourages you to improve
  - surrounds him/herself with other competent and motivated people
- If your boss won't champion you and your coworkers, your efforts to stay competitive will not pay off in increased job security.
  - At least, not at this job.

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Verbal and Writing Skills

- Good communication skills promote clarity of thought.
  - You need to know your stuff to explain it well.
- Good communication skills improve productivity.
  - Better collaboration with coworkers.
  - Better design and user documentation.

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Verbal and Writing Skills

- Take a writing class? Maybe.
- Find colleagues who write well and get them to critique your writing.
- Write an article for a journal.
  - Not a stuffy academic journal, but a trade journal like ESP.
- <rant>Don't write stream-of-consciousness emails. Think about it, write it, set it aside, reread it. Repeat until coherent.</rant>
- Join Toastmasters? *www.toastmasters.org*

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Technical Skills

- Most embedded developers are EEs.
  - About $^2/_3$ of the readers of ESP are EEs.
  - A little less than $^1/_2$ have CS degrees.
  - Obviously, some have both.
- When it comes to embedded development:
  - EE skills get you in the door.
  - CS skills improve your productivity.

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Technical Skills

- For better or worse, C is the closest thing to a *lingua franca* for embedded systems programming.
  - C programmers: Stop shrugging off the parts you don't understand.
  - C++ programmers: Don't underestimate the C in C++.

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Stop Shrugging

- Too many of us deal with compiler error messages by using the "Oh, what the heck" approach, as in:
  - "Oh, what the heck, throw in a '`*`' and see if it compiles."
- "Oh, what the heck" programming is unproductive.

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A Common Shrug

- Consider:

```
T *x[N];
```

- What is the type of `x`?
  - pointer to an array of `T`?
  - array of pointers to `T`?
  - pointer to pointer to `T`?
- You should know not only the answer, but the principles underlying that answer.

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Another Common Shrug

- Too many C programmers shrug off `const` and `volatile` because they just don't "get" them.
- Knowing how and when to use `const` and `volatile` can really improve both your productivity and code quality.

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Tool Time

- C is just one of many tools to master.
- "The tools we use have a profound (and devious!) influence on our thinking habits, and, therefore, our thinking abilities."
    – E. W. Dijkstra
- … and our productivity.

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Tool Time

- Dijkstra'a statement is one of many derivatives of the Whorfian Hypothesis…
    - "Language shapes the way we think, and determines what we can think about."
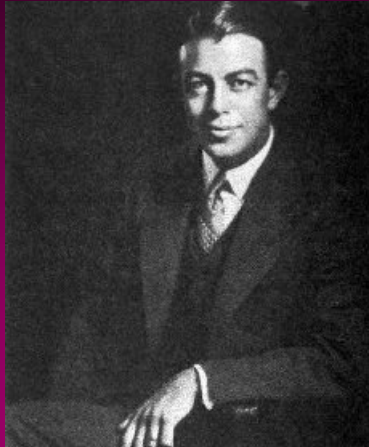   - Benjamin L. Whorf

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Not This Worf

- Lt. Worf…

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This Whorf

- Benjamin L. Whorf...

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The Whorfian Hypothesis

- Linguistic Determinism
  - *Strong*: Language actually determines thought.
  - *Weak*: Language influences but doesn't determine thought.
- The strong form is largely discredited, but the weak form has many adherents.
- The weak form certainly applies to programming languages and tools.
- There are times I think even the strong one applies.

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Language and Thought

- "A good programmer can write a good program in any language."
    - Someone who didn't know what he was talking about
- What if you aspire to be better than good?
- Can an excellent programmer write an excellent program in any language?
- All languages are not created equal.

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Language and Thought

- "A good programmer can write a *better* program in a more appropriate language."
    - Me, unless someone else said it first
- If C is the only programming language you know, your programming skills are more limited than you realize.
- At the very least, learn C++ or Java or some other compiled OO language, such as Ada or Eiffel.

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Other Tools

- Use scripting languages to automate repetitive tasks.
  - GUIs are turning us into programming couch potatoes.
- Take a serious look at UML and design patterns.

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3 Steps To Professional Success

- Choose to do what you love.
- Sharpen your communication skills.
- Expand your professional tool set, and master the tools most crucial to your work.

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Thanks for Coming

- This is where you applaud.

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