Evidence for the shortage
Delays in projects caused by movement of personnel
Delays in hiring
Wage increases
Silicon Valley start-ups having more difficulty finding key talent
Project failures caused by unqualified people in some sectors

Arguments against this evidence
There was a surplus of IT professionals 5 years ago
There have been dire predictions before: telephone operators and physicists
Labor shortages are cyclical and will disappear with rising wages
There are plenty of programmers, employers are too picky
No shortage exists -- employers want access to cheaper immigrant labor

Impact of the shortage
This issue will reshape the SW industry
   Consolidation in some publishing categories
   New relationships with outsourcers
   New awareness in top-level corporate strategy
   New tradeoffs and liabilities in product design
   Migration of talent to publishers and Òsoftware-awareÓ firms
In many industries, e.g. finance, some firms will gain competitive advantage
Increasing cost of software development
Increased failure rate for software products and software-intensive devices
Increased delays and abandonment rate for projects of all sorts
Slowing the overall adoption of technology
   America’s advantage is fundamentally tied to rapid technology change

Reason for the shortage
This is a demand vs. supply problem
   Computing technology becomes increasingly more accessible & accepted
   Demand for software comes from new ideas about how to use computers
   We appear to be reaching the limit of our programming capacity
We still cannot mass-produce software -- we depend on craftsmen
In many industries, SW has become critical to product and competitive strategy
The trend is for more SW of greater complexity & importance
The scope of the shortage
The shortage is global: not regional or national
Not limited to a few technologies like Java or HTML
Not caused by crises like the Year 2000 problem
Will get worse before it gets better; not likely to get better for a decade or more

Are there any solutions to this problem?
Limited increase in output of talented programmers from schools
  Capacity of training institutions is limited
  This is not the career for every smart kid: alternatives, stress, lifestyle
  Demographics is working against us as first-generation IT folk retire
Limited resources from abroad, even if immigration policy were relaxed
  India was a special case
No new technologies for pervasive improvement in programmer productivity

Enterprise strategies for coping with the shortage
Recognition of the strategic importance of software
  Audit software expenditures and software “asset”
  Business value of software may be clearer after December 31, 1999
Recruiting -- the best candidates no longer apply to IT shops
Retention -- it’s not just money
  Reorganize software development groups to attract top talent
Think strategically about software investment
  Simplify operations and systems
  Buy vs. build tradeoffs
  Make investments of money and talent for greatest impact
Nurture alliances with outsourcing partners and contractors
Invest in software infrastructure