Are you prepared for Globalization?

American Tech Workers must play a new role in the global economy.

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America's role in the global economy is shifting. US technology professionals need to cultivate the ability to articulate requirements and design specifications for software that is increasingly likely to be built by others. Historically, the software industry has paid short shrift to analysis and design. In this paper, Olympic Consulting Group chief methodologist David Ruble explains why it is vitally important that our nation retains and invests in specific software engineering skills that will keep America competitive. Are you ready for your new role in the global economy?

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American Tech Workers must play a new role in the global economy.

> *Dear valued technology employee: To enhance shareholder value, your job is now being performed in India at a fraction of the cost. We apologize that you heard no 'giant sucking sound' in advance of this notice. The technology now exists to beam your job overseas instantly and noiselessly. Have a nice day.*

Indeed, the economic vacuum cleaners of countries such as India, China, Mexico and Russia are inhaling American technology jobs at an alarming rate. Private companies and government agencies alike are rushing to offshore work that for fifty or more years has been the province of well-educated, well-paid American workers. Forrester Research Inc., projects that 3.3 million white-collar U.S. jobs will shift to low-wage countries by 2015. Any job that does not require "face time" is a potential target.

Organizations are sending American jobs overseas for one reason only: to cut cost. The post dot-com recession has lead CEOs to look for ways to curb spending and improve efficiencies in all areas of the enterprise. Information Technology's burgeoning budgets have made tech jobs a prime target.

As pundits and detractors argue the merits of offshoring's patriotism, the fact remains that American tech workers are now in a competitive field that includes skilled labor willing to work for a fraction of the cost of their US counterparts. The lure is simply too attractive for executives to pass up.

The offshoring trend started by shipping maintenance jobs, call center staff and code-to-spec programming jobs overseas. Now, we see more and more of the design and architecture tasks leaving our shores. Ultimately, Indian firms are now eyeing the jobs of the American software industry's business analysts. Allowing foreign nations to take over the definition of requirements and design for short-term cost-savings is long-term economic suicide. This trend is deeply disturbing, and should trigger alarm bells in corporate boardrooms across the country.

The greatest danger to the American economy is that US businesses will abdicate their responsibility to define requirements to overseas workers, and thus erode our nation's ability to effectively communicate innovative ideas into actionable specifications.

American's environment of competition and markets that are comparatively unfettered by bureaucracy and regulation fosters and encourages new ideas, products, services and technologies, which has resulted in over two hundred years of unparalleled technological innovation.

As the world's economies merge, American's role has shifted to being primarily designers and engineers rather than assembly line workers. If America is to remain a dominant force in the technological field, the software development industry needs to adapt to globalization by investing in its analytical and design skills. Unfortunately, the software industry has done a poor job of analysis and design to date.

In the first decade of the 21st century, the typical IT shop in America is still languishing at the bottom of the Capability Maturity Model barrel.[1] It is a great irony that while the American Programmer has reigned supreme for decades, throngs of consultants and pundits have warned that the industry to get its methodological act together. Waves of technologies; client server, web

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[1] The Capability Maturity Model for Software (also known as the CMM and SW-CMM) is a widely accepted model for judging the maturity of the software processes of an organization, developed by Carnegie Mellon Software Engineering Institute (SEI).

architectures, wireless services, and the dot-com frenzy distracted the industry from the basic tasks of becoming highly skilled software engineers. American executives have grown cynical about IT's ability to deliver. Many believe that if they're going to get mediocre results from IT, then they might as well get cheap mediocre results from IT.

As much as we'd like to believe this isn't true, one only has to look around at the continuing train wreck of software projects. Our industry can no longer be said to be in its infancy, or even its adolescence. Yet, in what should be a maturing field, the landscape is still littered with spectacular project failures – mostly as result of IT's inability to effectively collaborate with the business to define requirements.

In many IT shops, the role of business analyst – one who gathers and articulates business requirements for automation – is an *entry-level* position. This is not only absurd – it's dangerous! After all, the business analyst's responsibilities in an IT shop include gathering business requirements, modeling the processes, data and behavioral characteristics of the intended solution, and very often creating a functional specification that includes the definition of the human-facing interfaces. To a large extent, this job is very difficult to send offshore. It requires a high level of understanding of the business environment, as well as superb communication skills and frequent interaction with business stakeholders and users.

If American companies send this capability overseas, our nation will lose its ability to clearly define our own ideas.

American IT shops need to raise their Capability Maturity Model level and strive to achieve a more disciplined and controlled culture of software engineering. What American IT shops need now more than ever is to cultivate a cadre of professional business analysts and software architects that are experts at articulating business requirements and writing program specifications.

What should a CIO do to prepare for the global realities of the 21st century?

Ask yourself the following questions. If you find yourself answering "no" to any one of them, or concede that your affirmative answer is sprinkled with a liberal dose of wishful thinking – you have a capability gap.

My IT shop routinely demonstrates mastery of the following skills:

Skill	Yes	No
Facilitate JAD sessions, eliciting clear requirements from business members and clients		
Write clear, unambiguous, measurable business objectives for projects		
Manage and convey project scope using context models and business event lists/use cases		
Model business events, use cases and procedures at a detailed level		
Model the logical data requirements for a project		
Model the data requirements for the business enterprise		
Create state-transition models to represent status transitions		
Clearly convey written summaries of project requirements to a business audience		
Solicit and evaluate design and construction proposals based on requirements models and analysis artifacts		
Model the prescribed architecture of a multi-tiered software application		
Write unambiguous system performance and quality requirements		
Design graphical user interfaces based on analysis artifacts		
Write detailed user interface specifications that unambiguously stipulates		

the content of each screen, as well as the enablement/disablement rules and functionality of each button, link or control		
Write detailed data access specifications that unambiguously stipulates the data requirements for each screen and function of a software application		
Write unambiguous and detailed coding standards		
Write QA test scripts based on design specifications		
Execute User Acceptance Testing (UAT) based on tests written from design specification		
Record and compile meaningful metrics for IT activities, such as requirements analysis, design and UAT.		

The preceding list contains the basic capabilities of a software engineering culture – with the exception of the coding. Whether your shop out sources construction only, design and construction, or continues to develop in-house, these skills are more important than ever in the 21st century.

Our place in the world economy has permanently changed, however it's not all doom and gloom – nor do I believe it is a "race to the bottom" as some predict. Free markets, like the forces of nature, abhor an imbalance. A high-pressure system meets a low-pressure system and for a short time, winds howl and lightning bolts fly. Eventually, a new balance is achieved.

The average tech worker in Bangalore, India makes about $12,000 per year, compared to $80,000 in Seattle. While these figures might suggest staggering cost savings from offshoring, Gartner Research shows that the actual realized savings is approximately 40% – after all of the costs are tallied. That's still impressive, yet when one considers that IT salaries in the US have virtually flat lined or have dropped, while IT salaries in Bangalore are rising at annual rates of 20% or higher, it is a matter of time before the growth of the global middle class starts to erode at the margin of savings.

The burgeoning cadre of white-collar professionals in developing nations will create a demand for more technology and more software. These countries are becoming more and more dependent on the global market economy and the health and well being of capitalism and democracy. The big winners will be companies and nations that can meet their increasing demand for goods and services – which is precisely the reason why America cannot afford to export its capability to express requirements. America, instead, needs to *invest* in its ability to express requirements. We need to remain the world's innovators, architects and engineers – converting American ideas into clear and actionable specifications.

About the author

David Ruble is an analyst, designer, author and educator. He is widely regarded as an expert in the field of information modeling; object modeling and GUI (graphical user interface) design. He has been a principal analyst and designer of many mission-critical client/server corporate information systems, e-commerce systems, as well as applications in the public safety sector. As an educator, he has taught software engineering techniques to hundreds of students throughout the United States. He is the author of the popular book, _Practical Analysis & Design for Client/server & GUI Systems_, published by Prentice-Hall. David is a Principal at Olympic Consulting Group.

About Olympic Consulting Group

Olympic Consulting Group (OCG) is a full-service system architecture and development firm. Located in the heart of the Pacific Northwest's high-tech corridor, OCG specializes in the analysis, design and development of mission-critical transaction-processing systems and offers training and mentoring to help clients raise their software engineering maturity level. www.ocgworld.com

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