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How Quantum Computing Shapes Security

By Ken Wilson

Making Mistakes is No Mistake

By Gregory Lay

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Message from the President



This month's *NaSPA Technical Support* was a real treat for me. For those of you who know me well, you are aware that I am an avid Science Fiction reader. I'm not into dragons or fantasy, but love SF provided that it is grounded in fact.

I recently completed several books that spoke about Quantum Computers. Now mind you I only know enough about Quantum Mechanics to be ignorant of the topic but it has been one of the things that has always held a fascination for me. Well, imagine my surprise when Sharon Wrobel found an article this month about the topic from NaSPA Member Ken Wilson stating that Quantum Computing is here. Now. As a professional that does Business Resumption and Contingency Planning for a living I now have a whole boatload of new things to consider. So do you. Don't miss this article.

Right up there with QC is 3D printing – another "future" technology out there now. I read a while back that the International Space Station had problems and that NASA "uploaded" them a wrench! I thought that was pretty cool but again I was way behind the curve. I didn't know the half of it until I looked at NaSPA Member John Hornick's article and book. Wow. Just wow.

And not to be left out, NaSPA Member Apek Mulay is back with us with the latest installment of his Moore's Law service, not to be missed.

So much for the future but there is plenty for the present as well such as NaSPA Member Patricia Fripp with five hot tips for when you have five minutes with a prospect. Best I can see if you can't speak to a prospect you can't sell. If you can't sell you don't eat. If you don't eat there is no future so don't miss this article either! NaSPA Member Greg Lay's article about risk taking, more great tips for the here and now.

All in all great tips for the future and for now! Don't forget to eyeball the Jobs section and to advertise your next position on the NaSPA Job Site. It's your best avenue to find the talent you need.

Thanks to Sharon and our staff and sponsors for finding such a great slate of articles this month. How about you? Have you published with NaSPA yet?

Best Regards,

Leo A. Wrobel, President

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Network and Systems Professionals Association

How Quantum Computing Shapes Security

By Ken Wilson

Quantum computers use quantum mechanics to create computers that are much more powerful than today's supercomputer. For example, the current quantum computer is 3,600 times more powerful than the most powerful super computer we have to date. With all of these, what does this mean for security and online stored data?

Quantum Computing Could Damage Security

One side of the argument is that [quantum computing](#) could damage security. There is a chance that all information online could be hacked because a quantum computer has the power to crack an encryption code that is 400 digits long. Basically, it could hack any computer that is out there. Today's computers cannot even get close to hacking an encryption that is 400 digits long. In the wrong hands, the quantum computer could do a lot of damage to a lot of people's personal information, identity, and bank accounts.

Quantum Computing Could Make Security Better

Quantum computing is extremely powerful, which gives us the chance to have better security and better protect our information online. IBM is going to start using quantum computing as part of their [online security](#) at the end of 2016. They are currently the leading company when it comes to quantum developments, so for them to concentrate on quantum security shows how much faith they have in the system.

Another example is the quantum computer improving security is the computer called the D-Wave. This computer measures 10'x10'x10' and costs \$10 million. The D-Wave is expected to be used as a cloud based computing platform once it is put into use. It is unlikely hackers can purchase this type of computer, making the information stored in it much more secure than ever before. Furthermore, hackers will not be able to use this computer to hack an [encryption code](#) that is 400 digits

long because the computer will only be available to larger companies and corporations.

Large corporations that hold personal information and secret data will have the power of a quantum computer securing that information. The new computing power this system has to offer is unlike anything we have seen before. By the time hackers will have access to this type of technology; they will be years behind the curve. Hackers will have to learn the system, how the computer

Quantum computing is extremely powerful, which gives us the chance to have better security and better protect our information online.

works, and then be able to hack it. It will take a lot of time for them to learn without any experience, making the quantum computer and the [stored data](#) more secure.

The quantum computing system has the potential to damage or make security better. There is an argument for both sides, however, the argument for making security better comes out on top. The quantum computer will bring stronger, tighter, and more solid security than we have ever had before. The computer will not be widely available and it will have the power to block almost all hacking attempts since no current computer is as powerful as a quantum computer.

ABOUT THE AUTHOR

NaSPA Member, Ken Wilson is a Tech Guru and Security Specialist at [ThePCDoctor](#), Australia's Number 1 Computer Support company.

3D Printing New Jobs

By John Hornick

This article is excerpted from [3D Printing Will Rock the World](#) (available on Amazon or Kindle)

One Machine Does It All

US manufacturing output has steadily increased since the end of World War II, but manufacturing jobs peaked around 1975 and have been declining ever since. This means that US manufacturers have become very efficient, making more things with fewer people. But as we lose jobs to faraway places, a big question arises: What are Americans to do for work? As I explain in my new book, [3D Printing Will Rock the World](#) (available on Amazon or Kindle), 3D printing may be a big part of the answer to that question.

Bringing jobs home

Because 3D printers can make entire parts or products with fewer machines, fewer steps, and therefore fewer people, they can eliminate the benefits of making things where labor is cheap. The implications are obvious: more manufacturing in America, but not many jobs running the machines. Ten manufacturing jobs lost in low-wage countries may create only one job in a 3D printing economy, but let's be careful to compare apples to apples. If it takes ten people to operate the traditional machines needed to make a single part, it may take only one person to operate the 3D printer that makes that part in America. To the optimist, that is one more manufacturing job than we had without 3D printing. To the pessimist, we still need nine more jobs. But the pessimist is missing an important point: if the part is made in America by

a local worker operating the 3D printer, most of the supply, support, and distribution chain will be here too.

Regional and Distributed Manufacturing

Because chasing cheap labor is unnecessary in a 3D printed world, this technology can break the grip of centralized manufacturing. But don't assume that huge factories will simply replace their traditional machines with 3D printers. As 3D printers become more and more capable of making almost any finished product, centralized mass production may no longer be needed and, as a business model, may become as antiquated as the dinosaur. 3D printing will pull manufacturing away from the manufacturing hubs and redistribute it, product by product, among thousands or tens of thousands of smaller factories across the globe. Many parts and products will be made regionally, close to where they will be used.

As 3D printers become more and more capable of making almost any finished product, centralized mass production may no longer be needed and, as a business model, may become the dinosaur.

End of the line

The days of thousands of unskilled American factory workers performing highly repetitive, mindless tasks along an assembly line are gone for good. The factory of the future will be inhabited mostly by 3D printers, robots, and other advanced machines, all driven by software. Some people will be needed on the factory floor to make sure everything is humming along, but the jobs they will do may not exist today.

As technology advances, there will be little place on the factory floor for unskilled workers. In fact, even today there are fewer and fewer jobs for workers without skills or a college education. Between October 2008, when the world economic crisis began, and mid-2014, the US unemployment rate hovered in the 6–10% range.

During that same time period, the unemployment rate for college-educated workers was only about 3–5%.

In a 3D printed world, the demand for skilled workers will increase, but we don't know yet exactly what their jobs will be like. Some of those jobs are easy to guess. People will be needed to run the 3D printers, robots, and other machines. People will be needed at every step of the now-localized supply and distribution chain, even though their jobs will be radically different than they are today. People will be needed to build the factories, the 3D printers and other machines, and to make the materials the printers will use.

Think about the horse

So if 3D printing factories will not employ many people and most of the jobs will be for skilled workers, how will 3D printing spark a new industrial revolution, a manufacturing renaissance, and bring jobs home? Think about the horse. When the horse was the main form of transportation, there were many horse-related jobs: saddle makers, blacksmiths, wagon makers, stable owners, feed suppliers, etc. When the automobile came along, most of those jobs were lost. But think of how many new jobs were created by the invention of the automobile. 3D printing has the same potential.

Just as the nascent automobile industry looked nothing like the horse industry, the 3D printed manufacturing renaissance will look nothing like the Industrial Revolution. Factories of the 3D printing renaissance will be cleaner, safer, and employ fewer people. They will also be smaller, regional, and distributed all over the world.

Which industries will be disrupted first?

Industrial companies reliant on parts revenue are at high risk. But many products are consumer products. As time marches on, individual consumers will be more and more able to make such products themselves, or to have them made locally.

Companies that plan for such disruption of their industries may safely dodge the 3D printing freight train and hop aboard. Other companies will fail, either because they are stuck in horse thinking or because their business models are as unsustainable in a 3D printed world as camera stores and record stores are in the digital world.

New Businesses, New Jobs

3D printing will spawn businesses, products, services, and jobs that are as unimaginable today as the auto industry was at the dawn of the twentieth century. Of

course my crystal ball is not perfect, but some types of 3D printing-related jobs are suggested by its strengths.

Regional manufacturing means most players will be independent fabricators. A growing number of 3D printing fabricators can be found throughout the world. Some have been 3D printing for a long time, operating as rapid-prototyping shops. Some are start-ups. New companies like [iMaterialise](#) and [Shapeways](#) are well equipped with state of the art 3D printers and ready to print parts and products at multiple locations.

3D printing fabricators are the regional and distributed manufacturers of the 3D printing age. They are the employers of the factory workers of the 3D printing-fueled manufacturing renaissance. Individually, they may not employ a large number of people, but together they will be a major source of factory jobs.

Customization is one of 3D printing's strongest points. It is hard to imagine today how deeply customization will work its way into our everyday lives, but I suspect that in 2025 using customized 3D printed products will be as common as using mass-produced ones today. But those may be products that don't exist today or that are very different versions of today's products. Customizing products is a job generator.

As more and more 3D printers are sold, they will probably be networked, whether in professional networks or what I call "Friends Networks." 3D printer networks like [3DHubs](#), which connects users to thousands of 3D printers around the world, are already springing up.

The number of 3D printable blueprints available on the Internet is growing exponentially. They are being offered for use by a variety of startups. Some of these companies are providing libraries of existing product and part designs. Others provide software tools that enable users to create and customize designs.

3D printable digital blueprints are a company's crown jewels. If they lose control of them, their businesses could be destroyed. Enter the security entrepreneurs. Several start-ups have their sights set on this problem and have created data-management, encryption, and blueprint-security companies.

Computer programmers in the 3D printing job market will be like kids in a candy shop. They will be in high demand to write, update, and manage software to meet 3D printing-related software needs for anticounterfeiting, authenticating parts and products, customization, design, encryption, manufacturing, networking, quality control, and many other needs yet to be discovered.

Innovators Needed

Skilled 3D printing–related jobs soared 1,384 percent from 2010 to 2014 and were up 103 percent from 2013 to 2014. The three jobs most in demand were industrial and mechanical engineers and software developers. These jobs are being filled by the innovators of today. Tomorrow’s innovators are kids today. They are just starting to be initiated into the world of 3D printing, using consumer-grade machines.

Making Us Makers, Again

We are all makers at heart. For all of human history, except the last hundred years or so, when people needed something they made it. Then came the industrial revolution and eventually we became buyers, not makers. Makers and small businesses are the key to job creation. A quarter of US manufacturing companies employ fewer than five people and 60% of new jobs generated from 2009 to 2013 were created by small businesses. 3D printing can take us back to our maker roots, fostering technical innovation, new businesses, and jobs we never heard of.

ABOUT THE AUTHOR

NaSPA Member, John Hornick has been a counselor and litigator in the Washington, D.C. office of the Finnegan IP law firm for over 30 years. He is the author of the new book, 3D Printing Will Rock the World, and advises clients about how 3D printing may affect their businesses, frequently writes about 3D printing, and has lectured about 3D printing all over the world.



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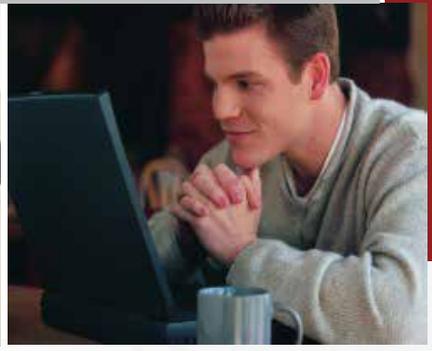
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Envisioning the Future of Moore's Law, More Than Moore & Beyond Moore for Global Semiconductor Industry - Part III

By Apek Mulay

In Part I of this article, we discussed the roadmap proposed by ITRS for the progress of semiconductor industry. In Part II, we discussed the changes in macroeconomic policy needed to ensure progress of Moore's Law to drive the growth of Moore's Law for the next 10-15 years. In Part III, we shall discuss envisioning the ideas proposed by International Technology Roadmap for Semiconductors (ITRS) for *More than Moore and Beyond Moore* so that not only does the progress become sustainable but it also becomes feasible to measure growth of the semiconductor industry. With the growth of the semiconductor industry measured by the progress of Moore's Law since 1965 until recently, there has been a predictability about progress to the next technological node driving investments into the economy to get a better Return on Investments (RoI). When there exist multiple drivers for the progress of semiconductor industry for *More than Moore and Beyond Moore*, as presented in Part I of this article, there has to be a conclusive measurement about the contribution to RoI. We shall discuss this in Part III of this article.

As elaborated in Figure 3-1 below, a few benefits of this three-tier business model is based on the Macroeconomic theory of Mass Capitalism, which will play a significant role in sustaining the progress of Moore's Law by means of increasing consumer purchasing power in the economy. Now, let me explain how this proposed model would also sustain the ITRS proposed drivers for *More than Moore and Beyond Moore*.

My two volumes *Mass Capitalism: A Blueprint for Economic Revival as well as Sustaining Moore's Law: Uncertainty Leading to a Certainty of IoT Revolution* covers all details about ushering in this three tier innovative business model. Let me briefly explain how the various drivers would sustain this progress of *More than Moore and Beyond Moore*. As shown in the above Figure 3-1, the ever increasing consumer demand will also drive the demand for the latest electronic gadgets. System-in-Package (SiP) inputs would cater to that demand for customized gadgets by means of obtaining those inputs from the prospective customers. The semiconductor companies that will form the middle-industrial tier shall employ those semiconductor industry professionals, which primarily interact with the end customer directly.

Depending on the inputs received from their consumers, the semiconductor industry professionals, at the middle industrial tier, draft specifications for products used in non-digital functionalities involving RF Analog ICs, Biochips, MEMS Sensors & Actuators, High Volume Power ICs, Passive Components, etc. that shall be combined into SiP driving the *More than Moore* path. The *More than Moore and Beyond CMOS* inputs will come from both lower and upper industrial tiers as companies at the middle industrial tier perform the function of Electronic Design Automation (EDA), juggling with different customized designs from lower industrial tiers as per their customized functionality from the end customer. The System-on-Chip (SoC) inputs for these new designs would come from the upper and lower industrial tiers,

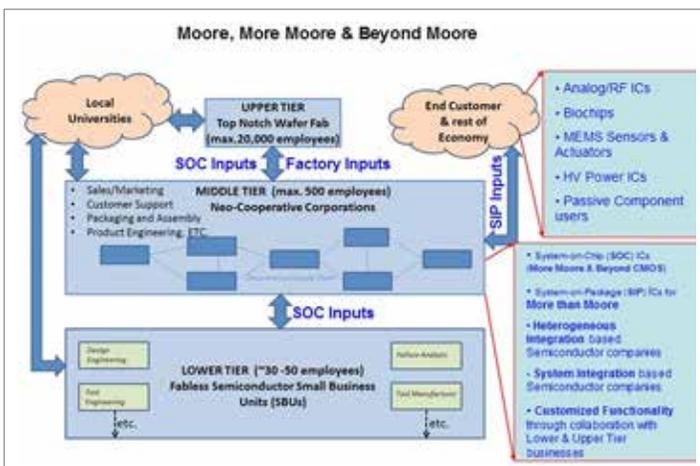


Figure 3-1: How the driving forces for industry 4.0 as proposed by ITRS fit into the Three-Tier Business Model based on Mass Capitalism.

which will provide SoC inputs for both circuit design and manufacturing process. This way, it will be at the middle industrial tier where heterogeneous integration of different designs and manufacturing processes will take place.

While the companies at the middle industrial tier shall consist of experts from different domains including design, process, failure analysis, etc., the manufacturing will be done primarily at the upper industrial tier and small businesses at the lower industrial tier will provide innovative designs, testing tools and methodologies, failure analysis and reverse engineering facilities, etc. that would be available for use by the middle industrial tier. By means of segregating all the different engineering functions at different industrial tiers, it would become easy for the semiconductor companies at the middle industrial tier to get real-time feedback based on the inputs in the economy. This would also help these companies meet their consumer demand by interfacing with the upper and lower industrial tiers. During economic downturns, the middle industrial tier could provide a feedback to both the upper and lower industrial tiers in order to avoid overproduction of electronics and thus avoid layoffs. Having small and medium size businesses

When the consumer demand steadily grows, then new businesses are created in the economy that caters to the growing consumer demand. This creates a multiplier effect driving the economic growth.

in the lower and middle industrial tiers would usher a competitive capitalism in semiconductor industry. For this model to work efficiently, Anti-Trust Laws have to be strictly enforced in order to avoid Mergers and Acquisitions (M&As), that result in the formation of business monopolies which will eventually destroy competitive capitalism or free markets and start controlling their prices. In this way, by ushering true free markets, there would be a check on the ability of a business to control prices in economy.

The progress of the semiconductor industry will be measured by the ability of this three tier business model to grow consumer demand in the economy by following a monetary policy such that wages keep track with employee productivity. There are several other macroeconomic policies like the *Minimum Requirements and Maximum Amenities* as discussed in my 2015 Volume *Sustaining Moore's Law: Uncertainty Leading to a Certainty of IoT Revolution*, which shall drive the consumer demand in the economy. When the consumer demand steadily grows, then new businesses are created in the economy that caters to the growing consumer demand. This creates a multiplier effect driving the economic growth. In this way, the proposed three tier business model shall ensure that global semiconductor industry will prosper for years to come driving the growth of knowledge based economy by providing a predictable RoI for businesses and thereby driving more investments into the economy. Additionally, when these ideas usher in the 4th Industrial Revolution in the form of IoT Revolution, the resulting industrial revolution would become long term, sustainable, and profitable.

Since its inception in 1965, Moore's Law has provided a predictable business model for Global semiconductor industry which led to high investments into the economy in order to reap a greater RoI. Hence, when the semiconductor industry plans on adopting *More Moore, More than Moore and Beyond Moore* as its drivers, it has to be ensured that there is a predictable business model for investments to come into the economy. As published by the ITRS chair, it takes 12 to 15 years of incubation time for newer technologies to show their impact on the progress of Moore's Law. However, the impact of the three-tier business model in driving the growth of the global semiconductor industry by sustaining the progress of Moore's Law will be observed immediately and without much delay.

A decentralized supply chain in the middle industrial tier would generate high growth and employment without large scale migration from rural to urban centers. This would avoid urban congestion and myriad related problems. Such supply chains also engenders a better customer satisfaction by means of guaranteeing product delivery through an alternate route in cases where the regular supply chain gets disrupted by unforeseen events like natural disasters and social or political instability.

It should be noted that this three tier business model for global semiconductor industry would wholeheartedly accept automation in the industrial sector. With the use of new electronic gadgets, the labor productivity would grow exponentially and hence the supply of goods into the economy would also grow. In order to maintain an economic balance, consumer demand would have to match the growth in supply. In such a scenario the middle industrial tier sector would be able to meet the required production target with fewer work hours but pay its workforce a higher salary in proportion to their higher productivity resulting from the use of machines. This would give sufficient time for employees to pursue further education, vocational training and help the workforce to keep up-to-date with the desired skills needed to continue their careers in an ever progressing and rapidly advancing semiconductor industry.

This business model would make significant contributions to completely automate the production of semiconductor chips from the beginning to the end, which is often referred to as "Lights-out-fab". Such a business model would not only lead the global semiconductor industry to its next level of innovation and financial success, but would also act as a model for other sectors in the economy leading to a vibrant growth of regional and national economies. In this way, the three-tier business model can envision the *More than Moore and Beyond Moore* drivers to sustain the progress of today's knowledge based economy.

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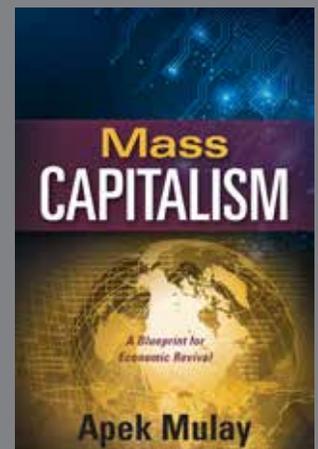
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Book Review Highlights -

1. "offers hope for embattled US economy"- Dr. Stanley Wolf
2. "an intriguing solution for semiconductor industry" - Dr. Kris Iniewski
3. "quite extra-ordinary" - Peter Gasperini
4. "Interesting and readable presentation of collaborative economics"- Dr. Stephen Willis
5. "excellent documented proposal for semiconductor industry"- Dr. Douglas Miller
6. "A wave of the future" - Dr. Ravi Batra
7. "Informed and informative, thoughtful and thought-provoking" - Midwest Book Review



Deployable Fiber Optic Systems Boost Oil and Gas Industry Reliability, Performance

Deployable systems, often exposed in tough oil-gas environments, now come battle-tested

As the use of fiber optics has increased in the oil and gas industry to enhance production - via better data reliability, availability and performance than traditional copper communication systems - so have the number of "deployable" systems used in remote locations. These applications range from offshore and land-based rig automation to real-time sensors for pipeline monitoring to systems for GEO exploration, wireless communications, security infrastructure, smart well controls, and operations control centers.

In the field, "deployable" systems are increasingly important to ensure satellite uplink networks, DCS/PLC automation/control, CCTV for physical security, SCADA for pipeline control, monitoring and wellhead automation, as well as LAN/WAN communication infrastructures for shore-to-platform and inter-platform connections.

In contrast to fixed installations, deployable systems are designed to be quickly installed, retracted, and then relocated in the field in some of the most inhospitable environments on earth.

As oil and gas exploration/production continues to get more remote as well as colder, hotter, or deeper, deployable systems will become even more vital to the industry.

Given the environments in which they reside, oil and gas-grade fiber optic systems are typically commercialized versions of field-tested, proven military-grade products.

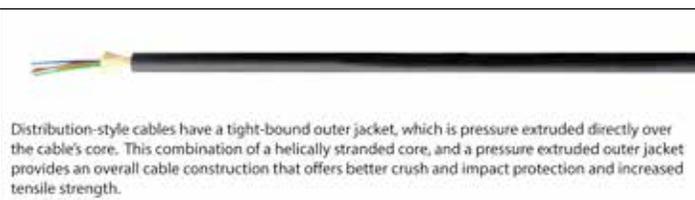
As such, the component parts of the system are designed to withstand everything from dust and debris to chemical exposure, temperature extremes, UV, radiation, electrical power transients, interference, fire, moisture, humidity, water, crush, tension, flexing, impact, and vibration.

Rick Hobbs, Director of Business Development at Optical Cable Corporation (OCC), explains that when designing a deployable fiber optic system, it needs to be looked at in its entirety. Unlike fixed applications, a deployable system is designed from beginning to end (plug and play) and delivered to the customer as a complete solution. OCC designs and manufactures fiber optic cable, connectors and assembly solutions for harsh and rugged environments.

According to Hobbs, the primary elements of a deployable system include hardened cable jacketing; "genderless" connectors for quick deployment without regard for male or female ends; hybrid systems that include copper along with fiber to deliver data communications and power; and reel systems that speed deployment and retraction while protecting the fiber while not in use, or during transit.

Hardened Cabling

For purposes of deployment, OCC typically recommends its tight bound, tight buffered distribution style cabling, which is ideal because of its small diameter and lightweight construction.



Distribution-style cables have a tight-bound outer jacket, which is pressure extruded directly over the cable's core. This combination of a helically stranded core, and a pressure extruded outer jacket provides an overall cable construction that offers better crush and impact protection and increased tensile strength. This also reduces outer jacket buckling during deployment.

According to Hobbs, escalating degrees of cable protection are available as needed to meet the specific needs of an application.

Various jacket materials are available, including PVC or polyurethanes, which are specifically tailored to meet the mechanical and environmental needs of the application. Options within each jacket material include coefficient of friction, cold temperature flexibility and temperature range, to name a few.

Water tolerant options are available that take advantage of the qualities of tight buffered cable and super absorbent polymer aramid yarn.

Fiberglass or metal braided jackets not only provide excellent abrasion resistance, but also deliver increased rodent protection. Custom rodent resistant cables are available that include metal or dielectric armor or additives to the outer jacket.

"In deployable applications, exposed cable is often an intriguing temptation for animals, which can, and often do, chew on it," says Hobbs.

Hybrid Cables, Connectors

For applications that can benefit from fiber optics and copper, hybrid connector-cables offer both within the same cabling sheath.

A distinct advantage of hybrid cable-connector solutions is that the customer can bundle both the high performance of fiber with the copper power or control signals in one cable. This reduces the number of cables that must be designed, purchased and deployed into a system.

It also offers distinct savings in labor and cable structure costs for the customer.

Genderless Connectors

"Genderless" connectors have both male and female elements, and perhaps are more appropriately described as dual-gender, and are often called "hermaphroditic". They are designed for quick deployment, allowing the user to unreel fiber cable without regard for male or female ends.

Companies such as OCC have further simplified the genderless design with user friendly mating interfaces (the company's EZ-Mate family) capable of "blind mate" and/or applications that require thousands of mating cycles.

In addition, the connector system is designed to resist extreme harsh mechanical and environmental conditions including high vibration, mechanical and thermal shock, and fluid immersion.

Another benefit of genderless connectors is that multiple identical cable assemblies can be daisy-chained (sequenced) together to extend the distance of a deployable system while maintaining polarity. Polarity can be an issue when connecting an odd number of traditional male to female gender connectors. In such cases, an additional connector is required to correct polarity. However, such connectors are known for high loss and add additional components for the customer. Therefore, genderless connectors are uniquely advantaged over traditional interconnection systems.

Distances of several kilometers are possible, limited only by system link budget (dBm).

"This type of genderless connector provides extreme flexibility in the case of redeployment, where the length of the cable assemblies required for the next application are not fixed, or even known," says Hobbs.

Reel Systems

The key characteristics of a reel system in deployable fiber optic applications are that it is lightweight, rugged and stackable for storage and transit, says Hobbs.

To meet these requirements, companies such as OCC are providing lightweight alternatives to traditional metal reels. Constructed of durable, yet lightweight, impact absorbing polymers, these modular advanced reel systems (MARS®) are designed specifically for the demanding needs of harsh, oil and gas-environment fiber optic installations.

Reels can be used with simple deployable axle or a flange supported deployment and acquisition system. These types of systems include A-Frames, cable acquisition cradles, transit case systems, tripods, bumper mounts, backpacks, backpacks with fiber optic slip rings, and cartridge systems.



Unlike fixed applications, a deployable system is designed from beginning to end (plug and play) and delivered to the customer as a complete solution.

These cartridge systems are a specially designed protective case for deployable cable reels that permits full deployment and retrieval of cable without removing the reel from the case. The cartridge system, which comes with casters, is an ideal choice in many deployable applications.

"Using a cartridge system, a single person can handle multiple spools at once and can quickly deploy fiber and rewind on the reel without assistance," says Hobbs.

To simplify shipping and transit, cartridge systems, transit cases and reels are designed with interlocking stacking features.

Reel systems also provide a measure of protection of fiber optic cabling for unspooled cabling, or when the cabling is retracted.

"In harsh oil and gas environments, when you can put your fiber optic assemblies in a controlled environment storage system like a reel, possibly together with a cartridge, any potential damage to the cable or the connectors is minimized," says Hobbs. "This reduces the need to refurbish components regularly, because the system is better protected during its deployment."

Wireless Access/Data Communications

Although deployable fiber optic systems are largely "wired," hybrid cabling (the combination of fiber optic and copper/electrical within the same cable sheath) also allows for installation of wireless access points anywhere. This is ideal when access points are constantly changing.

Unlike traditional wireless networking devices that require 110-Volt AC power for each device, with a hybrid system power can be supplied in the same cable that also carries voice and data.

As a result, any 802.11-certified devices are able to communicate through the network, including personal devices such as PDAs, laptops, VOIP devices and cell phones.

This provides personnel with the means to communicate with each other and even make calls outside the system. In addition, sensor-based data such as temperature, humidity, airflow and gas can also be collected and delivered wirelessly for use by the entire network.

Increasing Conversion to Fiber Optics

According to Hobbs, there are many oil and gas companies that are converting to fiber optics as the costs for components continue to drop, making fiber a better solution than copper in most applications. Even die-hard copper devotees are moving to fiber and when they do, they rarely look back.

"When oil and gas System Engineers realize the bandwidth opportunities, they usually expand their capabilities, and identify creative new ways to enhance the solutions for their applications," says Hobbs.

For more information about deployable fiber optic system for harsh oil and gas environments, contact Optical Cable Corporation (OCC) at:

5290 Concourse Drive, Roanoke, Virginia, 24019

Phone: (800) 622-7711, Canada (800) 443-5262

FAX: 540-265-0724

Email: info@occfiber.com

Visit the web site www.occfiber.com

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SNEAK PREVIEW OF JOB POSTINGS

Members! Here is Your Special “Sneak Preview” of Upcoming New Jobs, posting soon on the NaSPA Job Site

The following is a sample of the awesome jobs posted by employers in just the last 30 days on the NaSPA Job Site. NaSPA sincerely appreciates all the people who think of NaSPA first when they are looking for the ideal Information Technology candidate. They find the best people, and help NaSPA at the same time. These jobs have not hit our site yet so now you can have a “sneak preview” ahead of other applicants by Site right now and see what else is new!

Job Name Administrator
Position Title Administrator
Location(s) Dallas, Texas, United States
Description Administrator (Dallas, TX) using IT Middleware - IBM WebSphere/ WPS/ Apache Tomcat/ IBM HTTP Server/ Cloudera Hadoop/Linux/UNIX. Deploy applications, Install and configure LDAP, Performance tuning for high availability and scalability, Monitor Cluster connectivity and security, Implement policies for workload management. Send your resumes to CloudGamut Inc. at hr@cloudgamut.com

Position Title BI Developer Advisor
Location(s) Woodland Hills, California, United States
Description Anthem Inc. in Woodland Hills, CA seeks a BI Developer Advisor to interface with developers, business analysts, system analysts, architects, DBA's, Lights On Team, Production Control team, Date Integration Services, and data architects for completing the necessary activities related to assigned projects. Requirements: Bachelor's degree in computer science, engineering or related field (willing to accept foreign education equivalent) and 6 years of experience in BI ETL analysis and reporting. Specific skills/other requirements must have demonstrated proficiency in the following: Teradata, Oracle and SQL Server coding and performance tuning/optimization; implementing ETL features/functions in Informatica; full SDLC, including one or more of Agile, Waterfall or Lean; presentation of design documents to both IT and business stakeholders; data warehouse/data modeling; and healthcare/insurance domain. Must be certified in one of the following: Informatica (Architect level), Oracle or SQL. Salary: \$120,453.00/yr. M-F, 8am-5pm. Submit resume to Recruitment and Employment Office, Anthem, Inc., Attn: Job Ref #: ANT30676, P.O. Box 56625, Atlanta, GA 30343.

Job Name Computer System Analyst
Position Title Computer System Analyst
Location(s) Hauppauge, New York, United States
Description Computer System Analyst – F/T; M-F, (7am – 4pm) - Hauppauge, NY for Fragrancex.com Inc. Bachelor's Degree in Computer Science or related field required. The Computer System Analyst must be available to work Monday – Friday, 7am – 4pm on site at our Hauppauge, NY (eastern Long Island / Suffolk County) under direction of company CEO and other technical supervisors. Under direction of CEO and technical supervisors, the Analyst will apply the principles and techniques of computer science, engineering, and mathematical analysis to analyze our computer system requirements in order to produce functional design specifications, and expand, modify and / or troubleshoot our systems to ensure timely and efficient work flow. The Computer System Analyst will design, develop, and unit test telecommunications protocol software for our high density information technology systems. The Computer System Analyst will aid in the detection and resolution of software defects, and provide code documentation to technical writers.

In addition, the Computer System Analyst will ensure that test plans satisfy user requirements, and will also be responsible for supplying

timely status reports on computer software development to supervisory personnel. Moreover, the Analyst must possess a working knowledge of computer programs like Microsoft.NET, Oracle SQL, Open Vms., and ISE Scheduler, and code language such as Java, C, C++, C#, BASIC, Python, Perl and MIPS. The Analyst will also be responsible for database design and maintenance and be able to work with the following database systems, web applications, graphics and related frameworks: SQL database structure and design, HTML, XML, JSP, PHP, .NET, OpenGL 2D/3D graphic, Java EE, JPA, Hibernate, Spring, Struts, ASP.NET and MVC.

The Computer System Analyst must also review, evaluate and report on computer printouts and performance indicators to locate code problems, and correct errors by correcting codes. Analyst will consult with management to ensure agreement on system principles, and the Analyst may confer with clients or IT vendors regarding the nature of the information processing or computation needs a computer program is to address. Our Analyst must also review current manuals, periodicals, and technical reports to keep informed about most recent IT trends and developments in order to keep our systems functioning in a modern and cost efficient manner. Lastly, the Analyst must possess strong programming and analytical skills, be well suited for developing algorithms, and analyzing and solving programming problems. Salary = \$65,000.

Mail resume to Recruitment and Employment Office, FRAGRANCEX.COM INC., Attn: Job Ref #: FRA35016, P.O. Box 56625, Atlanta, GA 30343

Job Name Customer Relationship Manager
Position Title Customer Relationship Manager
Location(s) Lincoln, Rhode Island, United States
Description Customer Relationship Manager. Manage customer engineering support and remote diagnostics for packaging and printing machinery and processes including three professional engineers: Plan and manage service trips including consult with the sales and technical sales teams regarding customer machine issues; review and evaluate installed machines at customers plant, spare parts, customer service, and new machine quotes/orders, and analysis of sales and service reports; meet with customer's production manager regarding technical, procedural or technical production problems and customer requirements and develop plan to address these issues during service visit; advise customer regarding required machine down time to conduct the comprehensive machinery analysis; oversee necessary machine optimizations to achieve improved operation and efficiency; closing meeting with customer to discuss existing quotes, suggestions for operator training, maintenance, necessary spare and wear parts; advise customer regarding any obsolete parts and possible retrofit solutions/ upgrades; and prepare checklist of necessary spare parts, service or retrofit quotes and follow up with the respective in-house teams. Manage prototype development support including monitor prototype development and execute technical and process based improvements and optimization of prototypes in conjunction with commissioning and engineering teams. Manage complex acceptance runs including oversee service technicians at customer plants performing technical and process optimization of the machine under production conditions to ensure smooth acceptance and handover to the customer. Manage complex machine operation complaints and consult with engineering, technical sales and sales teams to achieve resolution. Manage in-house engineers responsible for remote diagnostics of company's printing, extrusion and multiwall machines. Team works closely with customers on troubleshooting machine or process related issues to ensure trouble free operation of the packaging and printing machinery and equipment; and providing technical engineering customer support in parts identification, recommending preventive maintenance schedules and retrofits. Ensure that all customer queries are timely handled. Train Team members and provide guidance with technical engineering issues. Maintain and

evaluate Key Performance Indicators. Maintain regular customer contact and provide German parent company with timely feedback on quality/design issues. This position requires working at unanticipated client sites within North America (25-50%). Requirements: Master's (or foreign equivalent) in Electrical Engineering or related and 3 years experience in Electrical Engineering or Bachelor's degree (or foreign equivalent) in Electrical Engineering or related and 5 years post-Bachelor's progressive experience in Electrical Engineering. Technical background in Electrical Engineering including Drives, PLCs, HMIs, Robotics, Safety Systems and Communication Systems. Skill set must include following PLCs, drives and automation systems: Siemens Simovert VC, FC and MC drives; Siemens Simoreg DC drives; Aradex drives and control systems; B&R Acopos AC and servo drives; Berger Lahr servo and stepper motor position controllers; Siemens S5 and S7 PLCs; B&R 2003, 2005 and X20 PLC systems; B&R PROVIT, Power Panel and APC controllers and HMIs; B&R Powerlink, CAN-bus and Ethernet communication protocols. Skill set must include following PLC Programming languages: B&R PG2000; B&R Automation Studio; Siemens Step 5 and Step 7; and Beckhoff Twin Cat. Ability to read and interpret electrical/mechanical schematics and technical documentation. Detailed knowledge of packaging and printing machinery and processes. Effective verbal and written communication skills. Able and willing to work at unanticipated client sites within North America (25-50%). Salary: \$121,035. Work Schedule: Monday – Friday, 8:00am – 5:00pm. Employer: Windmoeller & Hoelscher Corp. (Lincoln, RI). Job location: Lincoln, RI. Work at unanticipated client sites within North America (25-50%). Send resume to Recruitment and Employment Office, WINDMOELLER & HOELSCHER CORP., Attn: Job Ref. #WIN39986, P.O. Box 56625, Atlanta, GA 30343.

Job Name IO51825
Position Title Senior Software Engineer
Location(s) Morrisville, North Carolina, United States
Description Senior Software Engineer (Morrisville, NC and various unanticipated worksites throughout the US) MULTIPLE OPENINGS - Provide business solutions by designing and developing complex or multiple software applications and creating information systems concepts for full project life cycle. Travel required to various unanticipated worksites throughout the US. Send resumes to Careers, IT People Corp., One Copley Parkway, Ste. 216, Morrisville, NC 27560 or apply at hr@itpeoplecorp.com. Must reference Senior Software Engineer position.

Job Name Software Developer, Applications
Position Title Software Developer, Applications
Location(s) Ann Arbor, Michigan, United States
Description Software Developer, Applications: Software development from design, development, testing, and deployment/shipping of products; Provide computing services with a range of software tools; maintain existing platforms and products. Bachelor degree or equivalent required. Email resume: recruiting@hooklogic.com, HOOK LOGIC INC, Ann Arbor, MI 48104

Job Name Software Engineer
Position Title Software Engineer
Location(s) Kansas City, Missouri, United States
Description Software Engineer, Kansas City, Missouri. Design, build, support Adstation® product. Develop & maintain web services & backend; ETL process using mix of scripting languages. Perform rigorous unit & integration testing of new code & enhancements within IDE & development servers. Install new code & enhancements to multi-server Linux production environment. Perform analytics & business issue research within team framework. Daily scrums. Write & maintain J2EE/REST web services using object-oriented techniques, write application code in scripting language, write analytics queries in SQL, build web service from scratch, troubleshoot complex interactions in environment with multiple services on multiple servers using different languages & technologies. Exp. with web technologies such as HTML, CSS, JavaScript, & AJAX. Exp. using Linux in a devops role. Night & weekend on-call rotation. Bachelor's degree in Computer Science, Statistics, Math, or Engineering & min. 3 yr. work experience in software engineering

or related. Suitable combination of education, training, experience acceptable. Apply to Recruiting, Adknowledge, Inc., 4600 Madison Ave., FL 10, Kansas City, MO 64112.

Job Name Senior Professional Services
Position Title Consultant - Security
Location(s) West Chester, Ohio, United States
Description Senior Professional Services Consultant - Security. West Chester, OH. Plan, implement, and monitor security measures for the protection of computer networks and information. Work with Cisco Systems security devices as Adaptive Security Appliances (ASA), IDS/IPS, VPNs, CCIE Routing and Switching, CCIE Security, CCIE Service Provider. Required: 2 years experience in job offered / related. Required certifications: CCIE Routing and Switching; and CCIE Security. NO PHONE CALLS. Forward resumes to: Logicalis, Inc., Attn: Mr. Mark Jenkins, Ref. KD, 2600 Telegraph Rd, Suite 200, Bloomfield Township, MI 48302.

Job Name Software Developer (Sterling Integration)
Position Title Software Developer (Sterling Integration)
Location(s) Jersey City, New Jersey, United States
Description Software Developer (Sterling Integration) (Jersey City, NJ) - Architect, develop, create and modify software applications within IBM's Sterling B2B Integrator (SI) suite, using Business Process Modelling Language (BPML) and XPath as well as other JAVA-based languages. Architect, design, build, maintain and troubleshoot SI customize business workflows to optimize operational efficiency. At highest technical level, oversee all phases of applications and programming activities including planning installation of enhancements, security features, and analytical tools within the SI suite. Architect SI integration with Enterprise Resource Planning systems. Provide guidance, training and oversight to junior personnel such as analysts and programmers. 40 hrs/week, 9am-5pm. Req's: Master of Science, Computer Science and one year of experience with IBM Sterling B2B Integrator, BPML, and XPath development in Software Developer (Sterling Integration) or Programmer (Sterling Integration) role. Reply to Jesmech, Inc. at: jerry@jesmech.com.

Job Name Software Engineer
Position Title Software Engineer
Location(s) Worcester, Massachusetts, United States
Description AVCO CONSULTING INC. has 24 openings for the position of Software Engineer. Candidate will be required to: Design, develop, implement, maintain and test business functions and web applications using variety of languages, tools, methodologies and technologies. Develop, create and modify general computer applications software or specialized utility programs. Analyze user needs and develop software solutions. Design software or customize software for client use with the aim of optimizing efficiency. Applicant must have a minimum of Master's Degree in Engineering (any), Computer Science, Technology or related. No experience is required. Any suitable combination of education, training or experience is acceptable.

The work location is in Worcester, MA-Avco Consulting, Inc.'s office from Monday-Friday 9am-6pm. This position requires travel to clients' location throughout the United States. The offered wage for this position is \$86,882.

Interested applicants should send their resumes to the United States Department of Labor's Office of Foreign Labor Certification by using the following mailing address:
 Recruitment and Employment Office
 AVCO CONSULTING INC
 Attn: Job Ref #: AVC36612
 P.O. Box 56625
 Atlanta, GA 30343

5 Tips When You Have 5 Minutes With A Prospect

By Patricia Fripp, CSP, CPAE

If you are on the phone, a webinar, or in person, and you have a few minutes with the executive, what do you say to keep on track and be professional? Here is an invaluable framework. Adapt it to your situation, and boost your confidence and credibility.

Imagine that you have a satisfied client company for one of your offerings. You feel now is the best time to discuss your next and higher investment offering. The team, your main contact, is ready to view a product demonstration set for the next day. All your demos are delivered in a webinar. At 2 P.M. you get a call from your main contact who says "Great news! Tomorrow our boss, who is the real decision-maker, is going to be in our office. Rather than just showing our team what you have to offer, the boss said he would like to sit in on the first five minutes. I know you will do well."

Don't panic. This is a great opportunity, and once you make a positive impact, the sales cycle is going to be cut short. You will not have to hear, "We love this, but now we have to convince our boss." This is, however, now your number one priority to prepare. You may be seasoned, but take this seriously. Your sales manager is always telling you, "Sell to the C Suite." This is your chance. Remember these five simple suggestions for sales success.

1. Build rapport before you speak. It is easier to connect if you can make eye contact with the client, so turn on your webcam to welcome everyone and then again when you answer questions. Although many professionals say they are not comfortable doing this, it has many benefits. Who can resist your friendly smile? You will look more confident, and it is tougher to say no when they are looking at you.
2. Be prepared, and get to the point. Remember, with an executive you need to be clear, concise, credible, and able to articulate the bottom line of your message. The higher up the corporate ladder you go, the more

quickly you need to get to the point and demonstrate value. As counterintuitive as it may seem, the less time you have in which to present your case, the longer you will need to prepare. You may have friendly chatter with the team before you get to business, but in this case every second counts. Be polite, respectful, and get to the point fast.

3. Remember you are not alone. Speak on behalf of your leadership. This way you can feel you are making a connection with the position, even when you are not holding that position yourself. You will discover that this technique adds to your confidence.
4. Remind the executive they have already made a wise decision by doing business with your company. Remind them that they have already researched your company and that they were comfortable enough to make you a vendor of choice. This is just a logical next step.
5. Make heroes of the team you are working with. These are your internal champions, and although they may not make the ultimate decision, they certainly have influence and can sabotage your sale. Your job is to work closely with the team or champion who will give you information. Do your research so that you are on target with your questions about their company and the approach the executive will most likely respond to.

When you have to deliver an executive overview, be clear and concise and sound credible. When you adapt this framework to your situation, you will get results.

"Good morning, Mr. Smith. On behalf of our leadership and my team, thank you for your business. As you know, we are committed to delivering the best service for our valued clients like you.

On a personal note, working with John and Mary is a delight. They are both helpful and incredibly efficient.

The purpose of this call is to deliver a high-level overview of our product that you have invested in, review your results compared to your expectations, and then introduce you to three other ways in which we can be of service.

Once we have proven the power of (our product), most of our clients find it logical to add _____ and _____ to their package.

John suggested you are most interest in seeing . . .

Mary mentioned you have ambitious goals for next year to . . .

That is an area in which we could be very advantageous to you.

My understanding is that we have four more minutes. Is that correct?

Let me roll up my sleeves, and you just sit back, watch the demo, and be amazed.

Please feel free to interject at any time.

Do you like what you saw?

Then our next logical step is to continue the conversation with John and Mary and prepare a draft proposal for your review.

Does that make sense to you?

Moving forward, is there any other area you would like for us to pursue?

Again, thank you for your business and the opportunity to demonstrate how we can continue to streamline your company."

Can you see the five suggestions in this simple outline?

It is recommended you turn on the webcam when you open and close the conversation. This makes it easier to make an emotional connection.

Because you are on a webinar, you can have your opening script and outline printed.

Once you internalize your new, tightened script, it will become second nature.

Make sure you smile. Your client will hear it in your voice.

ABOUT THE AUTHOR

Companies who want a competitive edge hire NaSPA Member, Patricia Fripp. She is a Hall of Fame keynote speaker, executive speech coach, sales presentation skills and on-line training expert. Patricia is also a subject matter expert for Continuing Education at XTRACredits. When your message must be memorable, your presentation powerful, and your sales successful in-person or online Patricia Fripp can help. To become a great speaker easily, conveniently and quickly you sign up for FrippVT. Why not sign up for your trial today: www.fripp.com

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Survey: 90 Percent of IT Professionals Say They Must Detect Cybersecurity Incidents That May Lead To Breach Within One Day

Yamaha YVC-1000 Conference Phone Recognized for Exceptional Innovation

SUDBURY, Mass. – Aug. 30, 2016 – [Revolabs®](#), Inc., a wholly owned subsidiary of Yamaha Corporation, announced today that [TMC](#), a global, integrated media company, has honored the [Yamaha YVC-1000](#) USB- and Bluetooth®-enabled conference phone with a 2016 Communications Solutions Products of the Year Award.

“The YVC-1000 is a powerful solution for today’s UC environments,” said Nick Emoto, vice president of business strategy at Revolabs. “For example, [Summit Public Schools](#), one of the nation’s foremost public charter schools, resolved critical audio failures that hindered video conferencing used for leadership meetings with the crisp, intelligible sound delivered by the YVC-1000. The conference phone is engineered to deliver better communication so organizations can productively collaborate and innovate.”

The versatile Yamaha YVC-1000 is a USB conference phone with Bluetooth capability that accommodates small to large conference spaces and rooms with special table configurations, such as a horseshoe, by daisy-chaining up to five microphones and optionally using outputs for two external speakers. Calls placed from a mobile device connected by Bluetooth can be bridged together with calls placed using a video conferencing unit or a UC client. The YVC-1000 delivers the most natural and intelligible sound for the room using an auto-tuning function that detects and monitors the acoustics of the environment to optimize sound processing.

“Congratulations to Revolabs and Yamaha for being honored with a Communications Solutions Product of the Year Award,” said Rich Tehrani, CEO, TMC. “The YVC-1000 is truly an innovative product and is among the best solutions brought to market in the past 12 months that facilitates business-transforming voice, data, and video communications. I look forward to continued excellence from these companies in 2017 and beyond.”

About TMC

TMC is a global, integrated media company that supports clients’ goals by building communities in print, online, and face to face. TMC publishes multiple magazines including Cloud Computing, IoT Evolution, Customer, and Internet Telephony. TMCnet is the leading source of news and articles for the communications and technology industries, and is read by as many as one million unique visitors monthly. TMC produces a variety of trade events, including ITEXPO, the world’s leading business technology event, as well as industry events: Asterisk World; AstriCon;

ChannelVision (CVx) Expo; DevCon5 - HTML5 & Mobile App Developer Conference; IoT Evolution Conference & Expo; IoT Evolution Developers Conference; MSP Expo; Real Time Web Communications and more.

About Revolabs

Revolabs delivers better communication in the world of business with professional microphone systems and conference phones for telephony and unified communications. The company’s introduction of wireless microphones for conferencing revolutionized business communications by allowing unprecedented freedom in meetings. Revolabs’ ability to produce superior sound in large, complex spaces inspires a full portfolio of conferencing solutions that enable the most reliable and natural conversation in every meeting space. With a full range of choices — from installed to simple plug-and-play systems, wireless or wired solutions, and local or cloud-based management — Revolabs offers the most flexible and uniform set of solutions to accommodate the needs of the entire business. Revolabs is a wholly owned subsidiary of Yamaha Corporation, one of the world’s most respected names in audio. Together they are redefining the market for business audio solutions. The company is headquartered in Sudbury, Massachusetts. More information can be found at [www.revolabs.com](#).

[www.ingearpr.com/Revolabs/160830Revolabs.docx](#)

[www.ingearpr.com/Revolabs/Revolabs_FLX_UC_1000.jpg](#)

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Making Mistakes is No Mistake

Take Risks Willingly To Find Learning Opportunities

By Gregory Lay

"Whattya mean, I'm not making enough mistakes??"

Ron sat dumbfounded at his boss's desk, wondering if she'd lost her mind.

"Take a breath," she smiled. "The point is that you're not reaching your potential because you're too worried about making mistakes."

"Of course I try to avoid mistakes. Didn't you just fire somebody for making too many mistakes?"

"Actually, no. That situation was because the same mistake happened regularly and the employee wouldn't follow an improvement plan. The difference is that repeating mistakes can get you fired, but learning from mistakes can get you promoted!"

"So how many mistakes am I expected to make?"

"That's your challenge right there!" exclaimed the boss, laughing. "Stop worrying about the number of mistakes you make. If your mind-set is that somebody is waiting for you to make a mistake, you're stuck in a self-conscious rut."

"Instead, imagine your customers and your team curious to hear what creative solution you'll come up with next! The ones that work give you a reputation as an innovator and the ones that don't work give you a chance to learn and improve."

"I do have an idea to try out on you to see if..." Ron began, but the boss interrupted.

"Will it help your customers?"

"I think so. If we..." But again, she interrupted.

"Then do it. You know your job; now have confidence to try ideas to improve your job."

Ron could tell the conversation was over. "Guess I've got work to do," he smiled.

"Good!" the boss replied, holding out a sheet of paper. "Here's a checklist to help."

How to Make 'Smart' Mistakes

• Dare mistakes to happen

Freezing to avoid mistakes is not growing. Learning comes from listening to helpful feedback and feedback comes when you're in motion. Mistakes become teachers when we recognize, communicate and implement course corrections.

• Consider values & objectives

Planning only for immediate challenges leads to frequently having to change shortsighted plans. Weigh ideas against long-range goals and organizational values and be willing to take risks to achieve those worthwhile objectives and values.

• Don't kill an idea with research

Begin when you have a reasonable fraction of data you think you need. The rest of the information will come as feedback when you're in motion; you're expected to make adjustments as you learn. Standing still to gather the last tidbits of information is indecision and some of the information you've gathered may even be outdated by the time you begin.

• Make team decisions

When team members have input into a choice, they're committed to making their plan succeed. If a mistake looms, they're committed to making corrections rather than assigning blame.

• Don't ask – tell

Playing 'Mother May I?' wears out your boss and leaves you powerless. Come up with a plan you believe in and report it matter-of-factly with your overall action plan. If the boss has questions, you'll hear them, but don't try to make the boss responsible for your plan's success or failure – that's your territory.

• **Take calculated risk**

'Safe' plans have lower learning potential. When you see an opportunity, leap at it! Whether succeeding brilliantly or going 'splat,' you'll have learned what happens when you do that and will generate new feedback to enhance your learning. Remember to thank people for their feedback, regardless of whether it was delivered kindly or soaked in vinegar. Then, let people (especially your team) know what you learned and what you'll do differently next time.

• **Serve your customer**

Correct decisions and mistakes are each made on behalf of your customer. Let them know how wise and brave they were when risks succeed and how confident they can be with your corrective actions when you notch a magnificent mistake. Any explanations you must make will make sense when you're in service of your customer.

• **Be accountable**

The game is 'No blame.' If a risk turns out to be a mistake, take full accountability and spearhead the effort to correct the outcome and document what you learned. Blame turns mere mistakes into failures and ruined relationships.

• **Share credit; take accountability**

When risks pull through with no major mistake, spread credit lavishly, making sure top management hears about the team achievement. Not merely so that others enjoy working with you, but because learning isn't only from correcting mistakes – people also learn and are inspired by seeing what it looks like when they get credit for mistake-free work.

Risk analysis isn't about avoiding risk; it's about identifying obstacles and knowing what you'll do when problems come up. Having a 'Plan B' and even 'Plan C' makes it more likely your exploration will carry the twin labels of 'educational' and 'successful!'

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NaSPA Member, Gregory Lay writes and speaks to help people improve their employment without necessarily changing employment. He's an experienced employee, manager, journalist, speaker, speaking coach, and trainer with a specialty in organizational understanding. To read his complimentary website or request his 52 Career Tips, go to www.AccidentalCareer.com.



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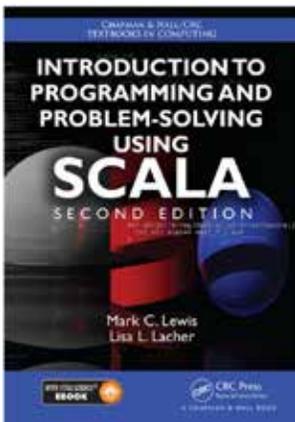
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A look inside the book... **Introduction to Programming and Problem-Solving Using SCALA** Second Edition

By Mark C. Lewis and Lisa L. Lacher



It is time to begin our journey learning how to program with the Scala language. You can download Scala for free from <http://www.scala-lang.org> to run on Windows, Mac, or Linux (see the inset below for full instructions on how to install). In this book, we will use the command line to run Scala. If you do not have experience with the command line on your machine, you can refer to

Appendix A for a brief introduction. Before looking at the language itself, we need to talk a bit about tools so that you can play along.

2.1 Scala Tools

After you have installed Scala on your machine there are several different programs that get installed in the bin directory under the Scala installation. To begin with, we will only concern ourselves with one of these: `scala`.¹ The `scala` command actually runs `scala` programs. There is a second command, `scalac`, that is used to compile `scala` text files into bytecode that is compatible with either the Java or .NET platform. We will only use `scalac` in the last chapter of this book, but we will begin using the `scala` command immediately.

There are three ways in which the `scala` command can be used. If you just type in `scala` and press enter you will be dropped into the Scala REPL (Read-Execute-Print Loop). This is an environment where you can type in single Scala expressions and immediately see their values. This is how we will start off interacting with Scala, and it is something that we will come back to throughout the book because it allows us to easily experiment and play around with the language. The fact that it gives us immediate feedback is also quite helpful.

To see how this works, at the command prompt, type in `scala` and then press enter. It should print out some

information for you, including telling you that you can get help by typing in `:help`. It will then give you a prompt of the form `scala>`. You are now in the Scala REPL. If you type in `:help` you will see a number of other commands you could give that begin with a colon. At this time the only one that is significant to us is `:quit` which we will use when we are done with the REPL and want to go back to the normal command prompt.

It is customary for the first program in a language to be Hello World. So as not to break with tradition, we can start by doing this now. Type the following after the `scala>` prompt.

```
println("Hello, World!");
```

If you do this you will see that the next line prints out "Hello, World!". This exercise is less exciting in the REPL because it always prints out the values of things, but it is a reasonable thing to start with. It is worth asking what this really did. `println` is a function in Scala that tells it to print something to standard output and follow that something with a newline character² to go to the next line. In this case, the thing that was printed was the string "Hello, World!". You can make it print other things if you wish. One of the advantages of the REPL is that it is easy to play around in. Go ahead and test printing some other things to see what happens.

The second usage of the `scala` command is to run small Scala programs as scripts. The term script is generally used to refer to short programs that perform specific tasks. There are languages that are designed to work well in this type of usage, and they are often called scripting languages. The design of Scala makes it quite usable as a scripting language. Unlike most scripting languages, however, Scala also has many features that make it ideal for developing large software projects as well. To use Scala for scripting, simply type in a little Scala program into a text file that ends with ".scala"³ and run it by putting the file name after the `scala` command on the command line. So you could edit a file called `Hello.scala` and add the line of code from above to it. After you have saved the file, go to the command line and enter `"scala Hello.scala"` to see it run.

2.2 Expressions, Types, and Basic Math

All programming languages are built from certain fundamental parts. In English you put together words into phrases and then combine phrases into sentences. These

sentences can be put together to make paragraphs. To help you understand programming, we will make analogies between standard English and programming languages. These analogies are not perfect. You cannot push them too far. However, they should help you to organize your thinking early in the process. Later on, when your understanding of programming is more mature, you can dispense with these analogies as you will be able to think about programming languages in their own terms.

The smallest piece of a programming language that has meaning is called a token. A token is like a word or punctuation mark in English. If you break up a token, you change the meaning of that piece, just like breaking up a word is likely to result in something that is no longer a word and does not have any meaning at all. Indeed, many of the tokens in Scala are words. Other tokens are symbols like punctuation. Let's consider the "Hello, World" example from the previous section.

```
println("Hello, World!");
```

This line contains a number of tokens: `println`, `(`, `"Hello, World!"`, and `)`.

When you think of putting words together, you probably think of building sentences with them. A sentence is a grouping of words that stands on its own in written English. The equivalent of a sentence in Scala, and most programming languages, is the statement. A statement is a complete and coherent instruction that we can give the computer. When you are entering "commands" into the REPL, they are processed as full statements. If you enter something that is not a complete statement in the REPL, instead of the normal prompt, you will get a vertical bar on the next line telling you that you need to continue the statement. The command listed above is a complete statement which is why it worked the way it did.

Note that this statement ends with a semicolon. In English you are used to ending sentences with a period, question mark, or exclamation point. Scala follows many other programming languages in that semicolons denote the end of a statement. Scala also does something called semicolon inference. Put simply, if a line ends in such a way that a semicolon makes sense, Scala will put one there for you. As a result of this, our print statement will work just as well without the semicolon.

```
println("Hello World!")
```

You should try entering this into the REPL to verify that it works. Thanks to the semicolon inference in Scala, we will very rarely have to put semicolons in our code. One of the few times they will really be needed is when we want to put two statements on a single line for formatting reasons.

While you probably think of building sentences from words in English, the reality is that you put words together

into phrases and then join phrases into sentences. The equivalent of a phrase in Scala is the expression. Expressions have a far more significant impact on programming languages than phrases have in English, or at the least programmers need to be more cognizant of expressions than English writers have to be of phrases. An expression is a group of tokens in the language that has a value and a type.⁴ For example, `2 + 2` is an expression which will evaluate to 4 and has an Integer type.

Just like some phrases are made from a single word, some tokens represent things that have values on their own, and, as such, they are expressions themselves. The most basic of these are what are called literals. Our sample line was not only a statement, it was also an expression. In Scala, any valid expression can be used as a statement, but some statements are not expressions. The "Hello, World!" part of our statement was also an expression. It is something called a string literal which we will learn more about in section 2.4.

For more information or to order a copy of this book, please visit

<https://www.crcpress.com/Introduction-to-Programming-and-Problem-Solving-Using-Scala-Second-Edition/Lewis-Lacher/p/book/9781498730952>

Scala on your Machine

If you only use Scala on a machine in a computer lab, hopefully everything will have been set up for you so that you can simply type the name of a command and it will run. To run Scala on your own machine you can follow the instructions below.

Installation

Scala requires Java® to run so if you do not have Java installed you should go to <http://java.oracle.com> and download then install the most recent version of the Java SE JRE. When you install Java, you can go with the default installed location. After you have Java installed you can install Scala. To download Scala go to <http://www.scala-lang.org>. On that site download the latest version of Scala. The code in this book was written to work with Scala 2.12.

Dealing with the PATH

If you are using Scala on your own machine, it is possible that entering `scala` or `scala.bat` on the command line could produce a message telling you that the command or program `scala` could not be found. This happens because the location of the installed programs are not in your default PATH.

The PATH is a set of directories that are checked whenever you run a command. The first match that is found for any executable file in a directory in the PATH will be run. If none of the programs in the PATH match what you entered, you get an error.

When you installed Scala, a lot of different stuff was put into the install directory. That included a subdirectory called "bin" with different files in it for the different operating systems. If you are on a Windows machine, you can see that you installed the program to `C:\Program Files\CRC\scala\scala.bat` file that you want to run is in `C:\Program Files\scala\bin\scala.bat`. You can type in that full command or you can add the bin directory to your PATH. To do this go to Control Panel, System and Security, Advanced System Settings, Environment Variables, and edit the path to add `C:\Program Files\scala\bin` to the path.

Under Unix/Linux you can do this from the command line. Check out that Scala you installed in a directory called `scala` in your own space. To add the bin directory to your path you can do the following:

```
export PATH=$PATH:/home/username/scala/bin
```

Replace "username" with your username. This syntax assumes you are using the bash shell. If it does not work for you, you can do a little something on the web for how to add directories to your path in whatever shell you are running. To make it so that you do not have to do this every time you open a terminal, add that line to the appropriate configuration file in your home directory. If you are running the Bash shell on Linux this would be `~/.bashrc`.

⁴On a Windows system this command should be followed by ".bat".

²You will find more information about the and other escape characters in section 2.8

³It is not technically required that your file ends with ".scala", but there are at least two good reasons you should do this. First, humans benefit from standard file extensions because they have meaning and make it easier to keep track of things. Second, some tools treat things differently based on extensions. For example, some text editors will color code differently based on the file extension.



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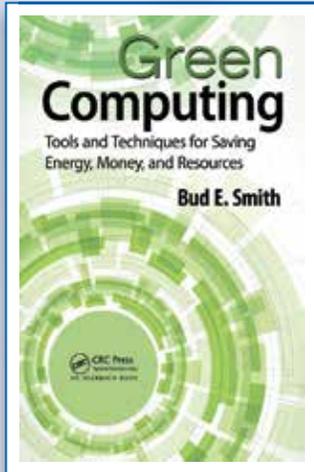
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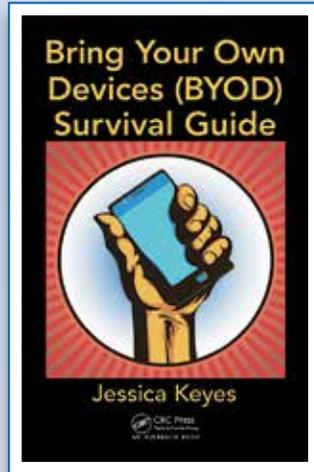
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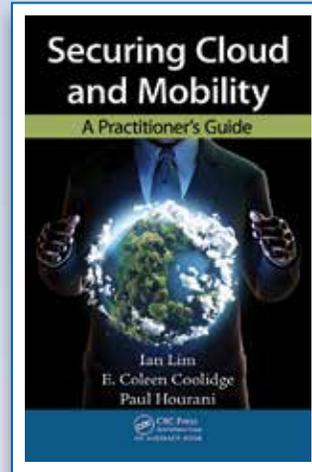
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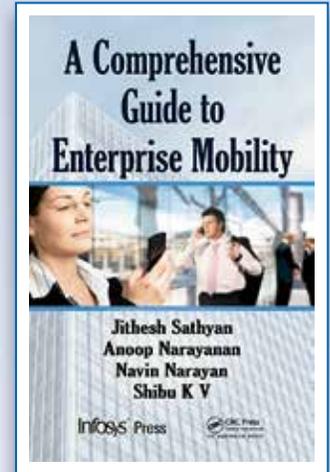
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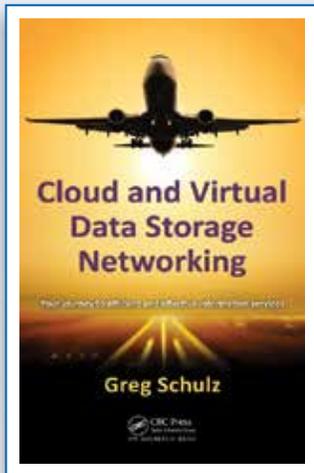
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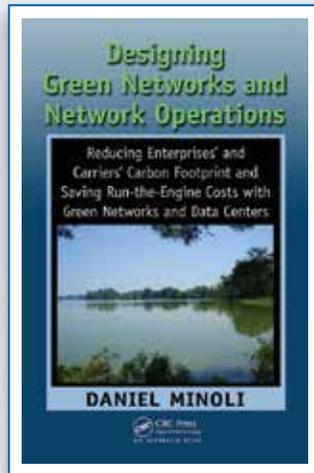
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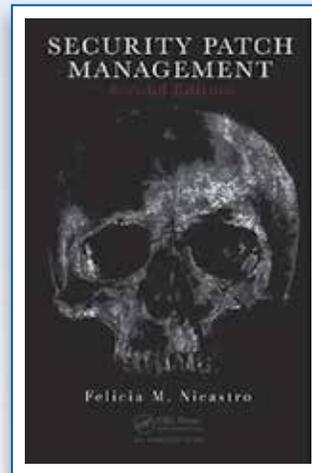
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