

## **Solving Your Top Four Engineering Challenges**

**An engineer's quick survival guide to adapting to the global economy**

Open Text Connectivity Solutions Group  
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## Summary

A shrinking global environment is making your engineering work more connected, more collaborative, and more challenging. Some of the challenges you're facing due to the current corporate climate include:

1. Issues with design management and version confusion caused by geographical dispersion and outsourcing
2. An increase in design complexity involving overlapping disciplines
3. Shrinking windows of opportunity and tighter deadlines
4. Lack of funding and resources

Many of your colleagues are realizing that adopting new solutions in response to an influx of new job challenges might be as integral to the process as the design work itself. It is a viewpoint that is substantiated by *Mind of the Engineer*, a study released in March based on a survey of design and development engineers.

Solutions to those challenges can be simple yet effective. Exceed onDemand from Open Text is a remote access solution that allows you to seamlessly access UNIX-based design tools in centralized application centers. Communication challenges introduced by long distances and far-flung team members are solved by high-performance usability, remote team collaboration capabilities, and other productivity-enhancing features, such as session suspend and resume and fail-proof protection.

In a time when the engineering community is facing unprecedented pressure to produce more complex designs in a shorter time span and with fewer resources, the downturn of the economy and the growing popularity of outsourcing have compounded the situation to a point where action is necessary. Exceed onDemand is a solution that helps you work smarter and faster without increasing your resource footprints or inflating costs. Ultimately, Exceed onDemand helps you architect new careerscapes in challenging yet opportune times.



Now is an opportune time to advance your career by implementing the best technologies.

## Today's Reality

Design integrity has always been, and always will be, at the heart of the engineering profession. However, you're probably noticing that the environment in which you now find yourself is causing some serious evolutionary challenges above and beyond design. In many engineering firms employees must learn new skills and expand their job responsibilities because of advancements in technologies, increasing project complexity, and the economic juggernauts of globalization and recession. These challenges may be leading you to unfamiliar territory where design integrity now lies at the periphery of your concerns.

Corroborating this viewpoint is *Mind of the Engineer*<sup>1</sup>, a study released in March based on a survey of design and development engineers to determine how they feel about their jobs and career challenges. Though developing quality designs is still a major concern, at the forefront of the study are issues related to job security, the global economy, and meeting deadlines. These concerns are legitimate and stem from an increase in outsourcing and product design complexity, and diminishing and aging resources available to manage the mounting number of design projects. These issues, which have traditionally been perceived as tangential to design work, are taking on greater significance in the current corporate climate.

These insights suggest that engineers who remain solely focused on design may not be taking advantage of current opportunities to improve and advance their careers. Issues such as system responsiveness, bandwidth usage, and dropped connections have escalated from irritations to potential sources of project error or failure. Your new reality includes a vested interest in implementing the best technologies for connecting to applications, communicating and sharing drawings, working remotely, and minimizing costs.

One thing is certain; this is your opportunity as an engineer to sculpt a rewarding and comprehensive careerscape. Gaining advantage in this highly competitive industry comes down to finding ways to work faster, smarter, and cheaper.

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<sup>1</sup> *Mind of the Engineer* is a biannual study released in March 2009 by Reed Business Information and the Electronics Design, Strategy, News (EDN). It is based on responses from 1,146 North American engineering professionals to investigate their plight and capture their job experiences.



46 percent of engineering companies outsource more than 10 percent of their work.

## Minimizing Outsourcing Complications

Unlike other professions, such as medicine and law, engineers equipped with the right tools can effectively conduct their work on a worldwide basis, and increasingly this is the expectation. Outsourcing of work that can be done remotely continues to grow. In fact, outsourcing is one of the top job concerns voiced by engineers in the report *Mind of the Engineer*.

According to the report, the split between companies that do and do not outsource work to another country is currently about 50-50 (46 percent do and 54 percent do not). Of the companies that do outsource, the amount of work sent offshore averages just over 10 percent. More than 20 percent plan to outsource more again this year. Trends indicate outsourcing is steadily gaining momentum. Although almost half (47%) of survey respondents feel that the practice of outsourcing has added expertise to their team, allowed them to take on more complex projects, and shortened design schedules, the consensus is that outsourcing is making it increasingly difficult to manage design projects.

In many cases, design team managers are changing focus to keep up with tracking, monitoring, verifying, and updating authorization codes for geographically diverse teams. Without established protocols and the tools to implement them, something as routine as updating drawing versions can create obstacles; for example, confusion can result from engineers collaborating on the same project from different time zones and different repositories of information. Version confusion presents a problem for many circuit design organizations that are conducting R&D at multiple sites worldwide where each site has its own data repository.

### Solution

Many tools and solutions now exist to support outsourcing by better countering inherent limitations such as distance, restricted resources, and finite budgets. Software solutions that act as a gateway to graphically intensive programs, such as EDA tools and CAD/CAM, now allow high performance over any connection. These solutions make it possible to work remotely over any geographical distance while offering a myriad of business features to help track progress and simplify design management.

Exceed onDemand from Open Text is a good example of a solution that offers remote UNIX application access. It is a solution that has the ability to support thousands of users at once, each with a workstation-like experience, while transcending geographical limitations.

Exceed onDemand opens new windows of opportunity for your engineering team through server resource consolidation. Instead of replicating hardware and software assets in every development site, you can reduce the number of data repositories by creating centralized design centers where your design tools and project data are

High Performance remote access can break geographical barriers between teams



As projects keep growing in complexity, engineers have no choice but to raise their game.

Engineers can share their designs with up to 100 times less bandwidth.

housed. Engineers withdraw the project data from unified hosting facilities, so design application suites can properly apply version control. Exceed onDemand helps alleviate version confusion and simplifies project data management.

Other productivity-supporting capabilities such as the ability to suspend and resume any active UNIX applications, accelerated 2D and 3D drawing, and remote team collaboration bridge the gap between distant team members and travelling colleagues.

## Upping Your Design Ante

In a matter of decades, engineers of all disciplines and industries have gone from a reliance on slide rules to specialized software to work out design and technical calculations. Computers, the Internet, and graphically complex applications are now mainstays of the profession, and slide rules are practically obsolete.

Engineers surveyed in *Mind of the Engineer* say the increase in design complexity is one of the biggest changes to the type of project they work on today versus two years ago. The increase in board density, bus speed, and more integrated components with extra functions embedded in a single chip, are factors that are leading to the ballooning of project data files. These massive files take longer to create and layout, load from data repositories, and validate through simulation – time that most teams don't have due to deadlines.

Compounding these issues is the overlap between disciplines such as analog, digital, processor-based, board-based, software, and test engineering. No one engineer is proficient in all disciplines, and the collaboration of different development groups is an obvious requirement. Yet, the growing distance between designers is making long distance communication difficult.

Between the increase in design complexity and interdisciplinary assignments, it's time to up your ante in terms of the knowledge and resources required to maximize your contribution and keep abreast of advances in design technology.

## Solution

As software companies continue to release increasingly robust products, a smart strategy is to leverage solutions that best engender the goals of bringing large, complex designs to market quicker. One solution with a proven performance record and excellent collaborative potential is Open Text's Exceed OnDemand.

Benefiting from the thorough understanding of the limitations of the underlying network technology, Exceed onDemand introduces a new paradigm of remote UNIX application access. A new communication protocol dramatically reduces the amount of data exchanged by up to 100 times, which allows engineers to access complex



Fast prototyping is the new holy grail of engineering companies.

Fairchild Semiconductor engineers used “Suspend and Resume” to save precious hours of simulation.

designs from limited bandwidth connections over long distances with better interaction, higher-performance, and greater responsiveness.

It's obvious that work is achieved faster in a team environment by working collaboratively with each person contributing their specialized knowledge. Getting answers to complicated questions can be simplified - just send an email inviting other experts to view the drawing on their own screens. The Desktop Sharing feature offered by Exceed onDemand allows engineers to view drawings from each other's screens and likely reach a speedier resolution.

## Doing More Work in Less Time

Driving down operating costs and increasing productivity is today's business mantra in virtually every industry and every organization, and these concerns don't apply only to executives and top level management. Every department in a company is being held increasingly accountable for productivity and expenditures. This being the case, it's no surprise that “doing more with less” and increased job functions and responsibilities were cited in *Mind of the Engineer* as the two biggest job changes over the last two years and the two most anticipated job changes in the coming years.

In highly competitive industries, deals can be won or lost in the time it takes to bring a product with the right specifications to market. Such is the challenge for design engineers at Fairchild Semiconductor, a global company that produces components used in electronic devices, where engineers were forced to cut time off the design cycle in order to get products to market quickly.

Contributing to these challenges is the tedious and time-consuming nature of many tasks in the design process itself. Even something as trivial as signing in to applications to make changes to project files can take up valuable time due to an arduous logon process. Then it can take several hours for applications to run physical design placement and routing and several more hours while design rule checking finishes. During this long execution time, accidental disconnections or interruptions of service, like a dropped connection or severe weather, can further extend the already lengthy process. If a team is working over different time zones and has pre-existing time commitments, they may never be able to resume the session.

Integral to your productivity as an engineer are programs that enhance mobility, promote multitasking, and lessen the effect of delays.

## Solution

While design tools are evolving to better aid you in the design process, Exceed onDemand focuses on increasing your productivity so you can produce more with limited time and resources.



The flexible “suspend and resume” feature in Exceed onDemand allows engineers at Fairchild Semiconductor to set up simulations, suspend them for any length of time, and then connect back in over the Internet, on any computer, at any location. The session resumes exactly where it left off without the need to restart a multitude of applications. By keeping simulations running day or night without having workers physically at their desks, it becomes easier to track progress and catch and correct problems early. This has the potential to shave precious time off a simulation and significantly boost productivity.

A “Fail-Proof” feature protects work against unexpected loss of bandwidth or power failure. If an engineer is running design simulation exercises from a distant location when weather related problems break the connection, the session is saved. The “Fail-Proof” feature facilitates quick reconnection and speedy recovery when the connection is restored. Support for Enterprise directories and other smart authentication devices significantly reduce engineers’ sign-in fatigue.

Fairchild now efficiently runs remote design centers by providing users with Exceed onDemand at all their U.S. locations.

Cost reduction policies are forcing many companies to reduce the number of workstations.

## Maximizing Your Resources

Many of the issues that engineering professionals face on a daily basis (i.e., system lag, lost connections, multiple sign-ins, etc.) are nuisances that can be easily remedied through the use of new technologies. However, for firms that are strapped for capital and resources, the strategy of creating new from old is the only available option. New budgets are not forthcoming in the current economic climate, so many organizations must find ways to breathe new life into their old systems.

Many companies still rely heavily on UNIX hosts for their complex but well established engineering applications, such as EDA tools. However, the demand for high-end UNIX workstations is thwarted by the simple economic fact that Windows computers are less expensive. Cost-reduction measures at some firms have you choosing between working from a laptop or keeping your UNIX workstation—but not both. This scenario creates a catch-22 situation where you are essentially being asked to choose between power and responsiveness.

Other design inefficiencies resulting from stretching resources can be attributed to a phenomenon called “server sprawl”. Many companies have taken an ad-hoc approach to support their design engineers, adding as many small-scale servers as needed to support their virtual design teams. This is the challenge faced by Renesas Technology Corp. in Japan, a world leading semiconductor manufacturer. Although deploying applications on new servers quickly and inexpensively satisfied immediate business demands, the company faced inflated infrastructure costs associated with hardware and software maintenance. Additionally, at many server locations engineers



Renesas Technology multiplied the number of engineers on their existing network by 10.

were being pulled away from their design work to deal with server issues. Like many organizations, Renesas soon found it was a short-sighted strategy.

## Solution

The remedy is as simple—and as cost efficient—as installing a tool on your PC in order to access the new technologies available. This effectively breathes new life into the old system by adding an additional layer of functionality; an application that protects your desktop by bridging the applications and the server. These performance gateway tools are a particularly good fit for the needs of engineering organizations, even beyond the fact that they make it possible to maintain and leverage existing infrastructures that are already well established and paid for—they also close the geographical gap between team members.

Eliminating small-scale servers, consolidating them in central locations, and equipping each engineer with Exceed onDemand wipes out server sprawl. Leveraging Exceed onDemand's data compression technology, Renesas reduces traffic volume between sites to one-tenth its previous level. In the truest sense of breathing new life to an old system and infrastructure, Exceed onDemand intelligently uses resources that are already in place, and Renesas is able to have a hundred users on a network that could previously handle only ten.

With increased network speed and performance on a strengthened server infrastructure, engineers are free to collaborate effectively on projects, regardless of where they might be physically located.

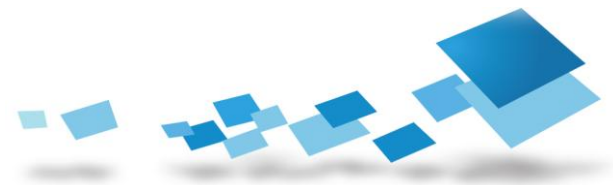


## Conclusion

The evidence suggests that the job challenges in the engineering community are being nurtured by the highly competitive and collaborative nature of the global economy. This has opened the profession to new challenges that, left unmet, stand to adversely affect you in an industry where seemingly conflicting must-haves include accuracy of design, competitive edge, and speed of delivery.

Solutions that enhance the design environment by making it easier for you to multi-task, meet deadlines, and cut costs are undoubtedly worthy investments. Conversely, ignoring challenges perceived as secondary to design function and failure to recognize issues that require better solutions are potential sources of error and failure.

For an ever-evolving profession that applies creative ingenuity to solve our biggest problems, the time has come to turn the process inward. Engineering and design teams must look up from their designs to take in the big picture and leverage the slew of new tools and solutions that technology has to offer.



## About Open Text

Open Text's leading connectivity solutions connect people, data and applications in mission-critical environments through a complete line of remote application access and data integration solutions. With 90 percent of Global 2000 companies relying on its award-winning solutions for over 20 years, Open Text understands the financial and operational challenges that most organizations face, whether they are multiple systems, disparate data sources, or geographically dispersed teams.

For more information about Open Text's connectivity solutions, go to:

[www.opentext.com/connectivity](http://www.opentext.com/connectivity)

Open Text is a leader in Enterprise Content Management (ECM). With two decades of experience helping organizations overcome the challenges associated with managing and gaining the true value of their business content, Open Text stands unmatched in the market.

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