



Counterpoint

The Alleged Mainframe Skills Shortage

Introduction

I've got a lot of respect for much of the market research that Gartner produces — but in this case I believe that Gartner is just plain wrong. In a recent research note, "Impact of Generational IT Skill Shift on Legacy Applications", Gartner suggests that a pending, projected decrease in mainframe-skilled individuals may be a reason to migrate to other, "more-modern application platforms". The logic, it seems, is that as baby-boomer mainframe coders and administrators leave the workforce over the next five to seven years, mainframe shops (particularly the smaller ones) are going to have great difficulty managing their mainframe environments or maintaining legacy COBOL code — so perhaps information technology (IT) executives should start planning to go to other platforms...

Following this same logic, perhaps IT executives should also abandon projects that require database management due to the far more severe shortage of database administrators (DBAs). And, while they're at it, maybe they should abandon help desk projects due to the great shortage of help desk personnel. And let's not forget the shortage of hardware engineers...

My point is this: there are shortages in computer skills across the board in the computer marketplace — so singling out a mainframe skill shortage is patently wrong. And to suggest that current mainframe users migrate from existing highly-available, highly-secure, highly-efficient mainframe platforms to other platforms due to certain skill shortages (which were left largely unidentified in the note) is just plain silly.

In this *Counterpoint*, *Clabby Analytics* examines this alleged mainframe skills shortage situation. And based-upon interviews with IT executives, university professors, IT recruiters, and IBM, what my research finds is that:

1. Some mainframe skills are indeed in short supply;
2. Other skills are readily available (especially Java/Linux skills); and,
3. The projected need for an army of mainframe-skilled IT professionals to replace the existing generation of soon-to-retire mainframers may never materialize.

In short, *Clabby Analytics* does not buy-into Gartner's "consider-going-elsewhere" proposition. Further, *Clabby Analytics* believes that the projected great loss of mainframe skills that is supposed to happen when all of us "old, gray-hairs" retire is little more than FUD (fear, uncertainty, and doubt).

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What the Gartner Report Claims

Gartner's report is copyrighted, protected, for sale for \$195, and can be found at: http://www.gartner.com/DisplayDocument?id=502222&ref=g_sitelink. The précis of this report proclaims that "the current generational shift in [mainframe] IT skills may surpass Y2K as an unavoidable challenge for today's application development groups." In other words, a projected shortage of people with mainframe skills may cause application development groups some difficulty as they seek to modernize legacy applications while supporting existing applications.

Gartner goes on to suggest that IT managers carefully examine their application portfolios — and take a series of actions, including possibly "re-platforming".

As you'll see in the remainder of this *Counterpoint*, this Gartner report just didn't work for me for several reasons, the most prominent of which is that it didn't convince me that there will be a critical shortage of mainframe-skilled laborers in the future. Further, it failed to identify which specific skills were "at risk".

It let me down on a number of other fronts too, including its failure to identify that there is a skills shortage across the entire IT industry (not just in the mainframe market); that this mainframe skills shortage problem is geographical; and that all of the new improvements that IBM is making in mainframe management may actually reduce the number of people needed to manage mainframes in the future as well as reduce the skills needed to manage mainframe environments.

Why I Believe that Gartner Is Wrong

First, the term "mainframe skills" needs to be better defined. In my research I found that IT managers, recruiters, and university professors have generally separated "mainframe skills" into four groups:

1. COBOL programmers (applications developers and code maintainers);
2. Administrators and managers (with CICS, zOS, and systems management skills);
3. Operations/planning staffs (business/design consultants, DBAs, and the like); and,
4. New applications designers (Java/Linux skill sets).

The skills situation in each of these categories varies widely.

A Closer Look at the COBOL Situation

It is estimated that there are between 150 billion and 200 billion lines of COBOL code in play in the mainframe marketplace today — *with several billions of lines added annually*. And despite rumors of its forthcoming demise, COBOL development is not going away soon (see "What Professionals Think of the Future of COBOL" by Drs. Ronald J. Kizior, Donald Carr, and Paul Halpern at <http://www.cobolportal.com/-/developer/future.asp?bhcp=1> for a more in-depth discussion of this dynamic). Still, given the huge base of COBOL code in the market today, it logically follows that IT

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executives who run mainframe shops should be very concerned about maintaining COBOL skills over time.

But the big question is: "is there a critical COBOL skills shortage in the world today?" And the follow-on question for strategic planners is "will there be a critical COBOL skills shortage in the foreseeable future?"

According to several IT managers that I interviewed (who, by the way, are continuing to develop code in COBOL), *there is no COBOL skills shortage!* But how can this be? After all, there are hundreds (if not thousands) of jobs for COBOL-skilled developers that can be found on major Web-employment sites such as Monster.com, Dice, ComputerJobs.com, Palodin Consulting, ZDnet Tech Jobs, RobertHalf.com and even justmainframejobs.com and justCOBOLjobs.com. What's the real story?

As I interviewed IT executives, IT recruiters, and university professors about this alleged COBOL skills shortage, the following picture developed:

- IT executives who are able to outsource their COBOL development and maintenance claim that there is no COBOL resource shortage. COBOL skills are "easy to find" in India and in other geographies.

For IT shops willing to outsource COBOL maintenance and development, there is no COBOL skills shortage!

- IT executives who cannot take advantage of outsourcing due to security or legislative restrictions are forced to rely on domestic COBOL programmers who are in comparatively short supply. These programmers usually make themselves available on a contract basis — and usually at premium prices.

Domestic COBOL programmers can be readily found if a given enterprise is willing to pay an inflated price.

- University professors told me that there is a perception in the United States and the European Union that COBOL is a dying programming language (in fact, one professor told me that there is an outright bias against COBOL at some universities). And as a result, the current generation of U.S and E.U. object-oriented programmers want little to do with COBOL. And further research showed that few U.S./E.U universities still offer COBOL courses.

At the university level, the talent pool for COBOL programmers is shrinking in the U.S. and E.U. This leaves mainframe shops with three options: 1) import COBOL-skilled labor from elsewhere; 2) build COBOL skills from within an organization; or, 3) find creative approaches to bring non-computer science majors into the mainframe fold. These options are explored in greater depth later in this report in the "Overcoming the Industry-wide Skill Set Problem" section later in this report.

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Also worthy of note is that some enterprises face an additional hurdle when attempting to recruit COBOL talent — a requirement to “own” their COBOL talent (in other words, a requirement to directly employ COBOL programmers). For instance, several government organizations require that their computer systems personnel be full-time, salaried employees (some for security reasons; others to limit expenditures on contract labor). And a few IT executives intimated that they wanted their contract COBOL programmers to become a permanent part of their enterprises’ IT team (as opposed to transient contract help). There is clearly a shortage of COBOL talent in the U.S. and the E.U. — and having to find permanent, full-time COBOL help presents a additional, real challenge to enterprises that have such mandates.

For enterprises with these special requirements, finding and keeping COBOL talent can be expensive. But, in the grand scheme of things, I believe that this additional cost is offset by the significant total-cost-of-ownership benefits offered by mainframe technology. (See “Does System z Offer Better TCO Than Scale-up, Distributed Unix and Linux Servers?” — free at www.clabbyanalytics.com).

Finally, I have three other notes on COBOL skills:

1. I interviewed some IT managers who were outside of major metropolitan areas (namely, in Wyoming and Kansas). These managers indicated that finding COBOL-skilled individuals can be “geographically challenging”. Venue has a lot to do with difficulty in hiring — and that applies across-the-board in all technical positions.
2. IT recruiters cautioned that prospective employers thoroughly examine a given programmers claims as there are many individuals who claim to have more experience than they actually do.
3. Some university professors are promoting the message that “COBOL will make you marketable”. Several of these professors mentioned that they inform their students that COBOL-skilled individuals are able to command higher salaries than their object-oriented, Java counterparts. Some domestic U.S. students are buying this message (but not many). By comparison, this message is playing really well at IBM’s Shanghai mainframe development lab where COBOL enrollments are way up and the money chase is on.

Systems Administration and Management Skills

As I researched skills shortages in the areas of administration and management, I found hundreds-upon-hundreds of openings posted on employment sites. These sites show that there is clear demand for mainframe administrative and management skills. Further, a large number of these postings often go unfulfilled over a thirty-day period, indicating to me that enterprises are having trouble filling these positions.

However, as I pondered these search results, the words of one IT recruiter that I spoke with kept coming back to me: “*the demand for mainframe skills pales in comparison to*

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the demand for hardware technicians, help desk staff, and client/server database administrators — particularly Oracle and SQL Server database administrators.” In other words, the problem of finding individuals with computer skills is not solely a mainframe problem — it's a problem across the entire computing industry...

How bad is this across-the-industry skill set problem? On the day that I visited Dice.com's Web site, I found 989 mainframe jobs posted. Of these, only 170 of these jobs were COBOL specific. Most of the remaining jobs were administration/management or operations jobs. But, these numbers represent only a fraction of the number of open requisitions for database administrators, help desk personnel, and hardware engineers. On that same day, there were 4,141 database administrator jobs available on Unix and Windows platforms; 4,667 hardware engineering jobs; and 2,445 help desk positions to be filled (that's double to four-times as many jobs that needed to be filled in these other, non-mainframe disciplines).

In short, there's a major shortage of trained IT talent across the industry — not only in mainframes! So does it really make sense for Gartner to single-out the mainframe as facing a critical skills shortage when other disciplines are facing far greater shortages?

Operations/Planning Staffs

Finding mainframe database administrators, business consultants, business process flow experts, designers, integrators, and testers is indeed difficult — but again, this is a cross-industry problem — not a mainframe-specific problem.

What's more intriguing is that there are still thousands of jobs posted for mainframe design, implementation, testing, and communications positions. This tells me that enterprises are still strategically committed to mainframes as back-end database servers, transaction engines, and security hubs — they are not looking to abandon or “re-platform” their mainframes.

Unix/Windows/Linux Mainframe Application Integration Skills

Over the past five years, IBM has reinvented the mainframe and endowed it with new processing capabilities. These capabilities include specialty processing engines (zIIP and zAAP), as well as the ability to run thousands of Linux instances on a mainframe platform. This ability to run the Linux operating environment, and accompanying Java applications, modernizes the mainframe. It makes it possible to use mainframes to run modernized (non-COBOL legacy) applications. And the ability to run these modern workloads solves a big problem for mainframe buyers because there are plenty of fresh college graduates available who have been trained on Java/Linux platforms.

If an enterprise purchases a mainframe to run Java/Linux workloads, that enterprise is likely to experience fewer problems finding the skills needed to run its mainframes.

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Questioning the Projected Mainframe Skills Shortage

There is a commonly held belief that the mainframe will be in serious trouble as skill sets diminish when the current generation of mainframers reaching retirement age. But is this belief vested in fact?

Consider these points:

- I could find no studies that showed how many mainframers are about to reach retirement age — but it is reasonable to expect that the bulk of these retirements will occur between five and twelve years from now (this is the timeframe when most of the baby-boomers reach retirement age). These retirements will happen in a phased manner (not all at once). And some prospective retirees will not retire at all, but will go on working beyond official retirement age.
- Add to this mixture that there are plenty of 35 to 50 year olds involved in managing mainframe environments today (not everyone who manages a mainframe is over 60 years old!). So there is a “second crop” of mainframe managers currently in the queue at many enterprises throughout the world.
- Mainframes are becoming easier and easier to manage. IBM is simplifying mainframe management and is spending \$100 million to give the mainframe a Windows-oriented, easy-to-use graphical user interface. By doing this, IBM is not only making it possible for lesser-skilled individuals to manage mainframes — the company is also making mainframe management appeal to our next generation of Windows-born-and-raised managers and administrators.

As near as I can tell, the projected mainframe skills shortage is anecdotal! And if there is an administrative skills shortage in the future, it may be remedied by improvements in the systems management interface.

Overcoming the Industry-wide Skill-set Problem

As stated earlier, finding individuals with COBOL, administration/management, and operations skill sets can be difficult — but this is a systemic problem manifest across the computing industry. Given that U.S./E.U. colleges and universities are not producing enough graduates with basic COBOL skills — these skills need to be found elsewhere. And this means that these skills will need to be imported; grown from within an organization; or that new and creative ways need to be found to tap the existing workforce for the skills needed.

In the United States, H1B temporary work visas that would enable computer skilled labor to be imported to the U.S. has been capped at 65,000 people annually. Given that our young people are not stepping forward to fill this computer skills gap, some enterprises are being forced to outsource IT functions. (Incidentally, this results in potential jobs going overseas — and in potential income tax revenues also going elsewhere...).

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On the other hand, this scarcity of resources is forcing some enterprises to become a bit more proactive about recruiting or growing mainframe talent. Several IT executives that I interviewed described “career days” that they have sponsored at universities to find and recruit top performers to their respective organizations. And some even admitted that they pursue even the middling performers and entice these people into their relatively high paying COBOL jobs. Further, numerous IT managers mentioned that they had attracted non-computer majors such as musicians and electrical engineers who found it difficult to make a living in those professions, and who made an easy transition into the mainframe computer world.

The scenario that is arising is that IT executive managers are getting creative in the ways that they are attracting mainframe talent to their organizations. Career days, internships, even stealing people from Unix and Windows with the lure of more money – are all approaches that are being used to ensure that mainframe skill sets are maintained.

Summary Observations

It would be daft to imply that there is no mainframe skills shortage. But, more precisely, my research shows that there are shortages of *certain* mainframe skills in *certain* geographies, primarily in the United States and Europe. And, to put this shortage into perspective, the existing mainframe skills shortage pales in comparison to the shortages of Oracle and SQL Server DBAs, help desk administrators, and hardware engineers that can be found across the entire computing industry. In other words, this computer skills shortage problem is systemic – it is not specifically germane to mainframe environments.

A closer look at the existing mainframe skills shortage finds the most acute shortage is in the area of COBOL programming and maintenance in the United States. And *Clabby Analytics* argues that a major contributor to this shortage is current H1B immigration policy because COBOL skills can be found readily in other geographies.

How are U.S. IT executives working around this COBOL skills problem? To work around U.S. immigration policy, IT managers looking for more COBOL support are: 1) importing as much COBOL help as they are allowed; 2) enticing workers from other professions into COBOL (musicians, engineers, etc.); and 3) migrating internal talent into COBOL support.

Gartner implies that mainframe skills problems will become more acute when some of the older, gray-haired, baby-boomers reach retirement age. *Clabby Analytics* could find no quantifiable studies that substantiate this projected impact. In fact, Clabby Analytics believes that this projected mainframe skills problem may be mitigated by improvements that IBM is making in the management interface for its mainframes – improvements that should lead to requirements for fewer, less-skilled individuals to manage their mainframe environments.

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Clabby Analytics also expects that new workloads will also play a vital role in ensuring the mainframe's longevity. By running IBM's Integrated Facility for Linux (IFL) and IBM zIIP and zAAP engines, IT executives can drive a whole new generation of modern applications onto mainframes. And staffing to fill Java and Linux opportunities is far simpler than trying to fill vacant COBOL slots (at least in the U.S). Expect that there will be no shortage of Java/Linux-trained individuals who can ply their wares on the mainframe for the foreseeable future.

When all is said and done, consider this: the mainframer is a special animal. He/she not only understands how to run a machine, he or she understands how an entire enterprise operates (programs, code, business logic, and more). It's hard to grow – much less replace this kind of knowledge (and therein lies the real challenge). The mainframe serves a unique role in the enterprise as a centralized, secure database hub, as a powerful transaction engine, and as a host of mission-critical business logic. IT executives know this – and maybe this is why the mainframe market grew 8% last year.

The bottom line: the Gartner suggestions that IT executives consider “re-platforming” or migrating to other “more modern application platforms” due to a projected, unsubstantiated shortage in mainframe skills needs to be re-thunk...

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