

# Empower the Next Generation of Mainframe DBAs

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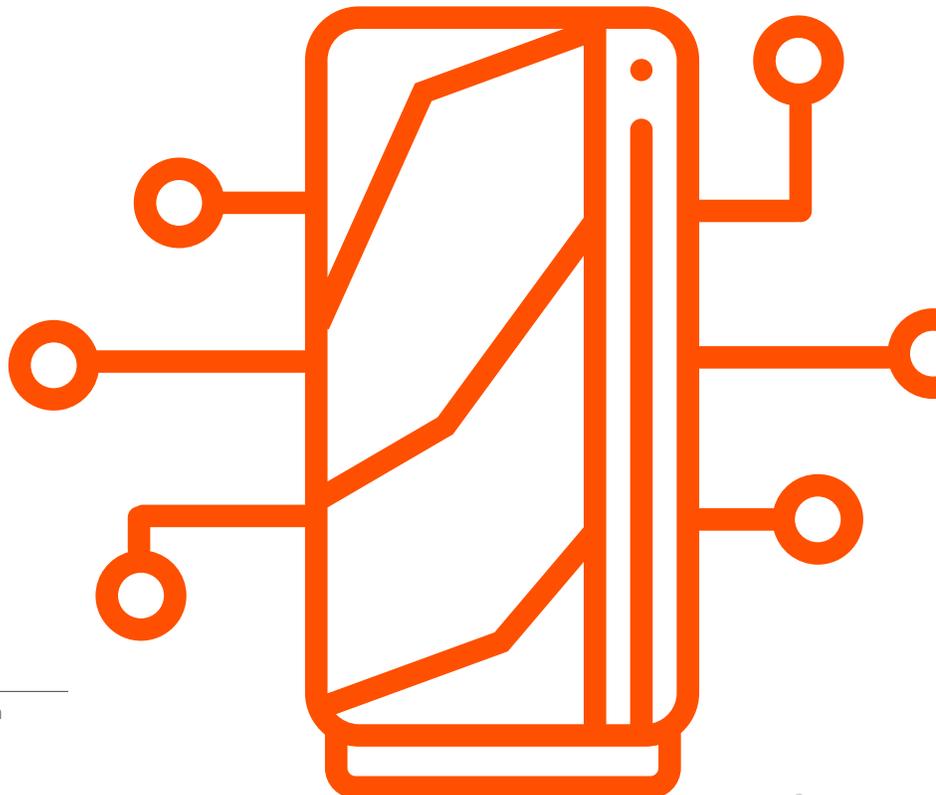
# Introduction

In 1966, a team of 25 people came together to build an information system for new computing environments. Representing IBM, American Rockwell, and Caterpillar Tractor, their goal was to effectively catalog all three million parts necessary to build a Saturn V rocket. Over the next two years, an extensive design and development process yielded the Information Control System and Data Language/Interface (ICS/DL/I), which flashed its first “READY” message on a NASA machine on August 14, 1968. In creating ICS/DL/I, the team not only helped launch a man to the moon—they launched a database management system revolution that is still powering industries to this day.<sup>1</sup>

The Apollo program accomplished its goal in 1969 when Neil Armstrong and Buzz Aldrin set foot on the lunar surface, but database management was just starting to gain momentum. Seeing myriad potential uses for the tool that had helped the

space program succeed, IBM renamed ICS to Information Management System/360 (IMS/360) and began selling licenses for its commercial use the following year.

It didn’t take long for IBM® IMS® to quickly reach new heights. Early customers were aerospace companies that wanted to process online transactions, but the late 1970s saw the addition of manufacturers, insurance companies, large retailers, and many others all looking for rapid data storage and retrieval capabilities. According to IBM’s “Icons of Progress” feature on Information Management System, “In its first two decades, the customer investment in IMS applications grew to approximately 10 to 12 billion lines of code.”<sup>2</sup>



<sup>1</sup> Uri Berman, Carl Chamberlin, Don Lundberg, et al, “Information Management System,” IBM, last modified January 1, 2011, <https://www.ibm.com/ibm/history/ibm100/us/en/icons/ibmims/>

<sup>2</sup> Ibid

# The Advantages of IMS

As quoted in a Vision San Jose article back in 1990, “If IMS were a company, it has been noted, that company would rank high on the Fortune 500 list.”<sup>3</sup> As of the 2011 publication of *An Introduction to IMS: Your Complete Guide to IBM Information Management System, 2<sup>nd</sup> Edition*, the Information Management System was continuing to power daily operations at 90 percent of Fortune 1000 companies across industries spanning manufacturing, healthcare, banking, government, insurance, and aerospace, to name just a few.

There are three reasons top organizations around the globe are still relying on IMS: availability, performance, and capacity. The authors of *An Introduction to IMS* cite one example where a very large IMS customer operated for more than a decade without an outage in a 24x7 environment.<sup>4</sup> Thanks to its hierarchical database structure,

speed of retrieval is unmatched, and IMS continues to process more than 3 million transactions each second.

For the most demanding online transaction processing (OLTP) applications, it’s a clear choice, and IMS isn’t going anywhere. According to Blackman et al, “The ongoing focus that IMS has in support of an open, integrated, simplified, on-demand operating environment, and the success of those who capitalize on their IMS investment, suggests that IMS will remain a major factor in enterprise architectures worldwide and continue to be a great fit for the future of IT.”<sup>5</sup>

IMS will indeed remain relevant, but the future certainly holds a few obstacles for the organizations that continue to rely on it—and one of the biggest mirrors the hurdle faced by the mainframe itself.

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<sup>3</sup> Ibid

<sup>4</sup> Barbara Klein, Kenneth Ray Blackman, et al, *An Introduction to IMS: Your Complete Guide to IBM’s Information Management System, 2nd ed.*, (Indianapolis: IBM Press, 2012).

<sup>5</sup> Ibid

# The Missing Mainframers

There was a time leading up to the turn of the millennium when experts were loudly predicting the imminent demise of the mainframe. Two decades later, and the platform continues to thrive. At the time of its release, IBM z14<sup>®</sup> enjoyed the most successful launch of an IBM Z<sup>®</sup> program to date, and the recent unveiling of the IBM z15<sup>™</sup> was followed by a 63 percent mainframe sales increase.<sup>6</sup> As CFO Jim Kavanaugh pointed out in a Q4 2019 (the first full quarter of z15 sales) call with analysts, “We shipped the highest MIPs (millions of instructions per second) in history this quarter, driven by growth in new workloads. And we’ve already seen broad adoption of the new mainframe across a number of industries and countries.”<sup>7</sup>

Of course, hindsight is 20/20, and while we now know doom and gloom predictions regarding the mainframe were patently false, they didn’t fall on deaf ears. You can hardly blame a generation of computer science majors for cutting out COBOL and forgoing Fortran to focus on shiny new distributed system coding platforms. As a result, the mainframe—which still stands atop the podium

as the most efficient and reliable computing platform in history—appears ready to outlast the careers of the people who built it.

Mainframers, many of whom jokingly refer to themselves as “dinosaurs,” aren’t likely to face an asteroid impact any time soon, but a frighteningly large portion of them are embracing retirement or welcoming the prospect in the next few years. A report from Forrester Research illustrated that **23 percent of mainframe developers** retired between 2013 and 2018, and BMC’s 2019 Mainframe Survey found that 37 percent of the mainframe workforce is **between the ages of 50 and 64**.<sup>8</sup> When these subject matter experts leave their organizations, they take priceless knowledge gained over decades of on-the-job training. Meanwhile, they’re passing the torch to teams already struggling with enterprise-wide IT vacancies and lack of experience on IBM systems in general. Just under one third (29%) of mainframers today have been on the job fewer than five years.<sup>9</sup>

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6 Motley Fool. “International Business Machines Corp (IBM) Q4 2019 Earnings Call Transcript.” The Motley Fool. The Motley Fool, January 22, 2020. <https://www.fool.com/earnings/call-transcripts/2020/01/21/international-business-machines-corp-ibm-q4-2019-e.aspx>.

7 Ibid

8 Chris O’Malley, “New Forrester Consulting KPI Study is a Must-Read for the Mainframe,” DZone, last modified April 10, 2018, <https://dzone.com/articles/new-forrester-consulting-kpi-study-is-a-must-read>

9 Ibid

# IMS Adapts

Finding the right IMS DBA (or any IMS DBA) for your organization will prove increasingly difficult as mainframers retire, but continued maintenance needs aren't going anywhere for the Fortune 500 enterprises that are heavily reliant on the mainframe. This is the code powering much of the banking and insurance transactions in the world, and in order to keep your IMS system firing on all cylinders and securing the continuity of the applications that run your organization, your IMS maintenance strategy must adapt.

IT managers and their human resource colleagues are looking at creative ways to cross-fill these positions internally, and complementary technologies will play a part in getting these new mainframers up to speed. With the functionality and flexibility to cater to both the first-generation DBA and the next generation, these new technologies can help close

the IT skills gap and even the playing field for promising candidates who simply lack mainframe experience.

Many organizations today are adopting a different approach to filling DBA positions by hiring or repurposing existing DBAs as “universal DBAs.” Generalized or universal DBAs typically have experience working with Java, Oracle, or IBM® Db2®, but they'll need the right tools to enable a seamless switch to IMS. The IMS catalog offers some of the capabilities universal DBAs might be used to, but utilizing it requires the modification of existing IMS change procedures. To avoid this unnecessary complexity, BMC has designed a solution that lets organizations continue to capitalize on IMS while offering several different management options designed to appeal to DBAs of any experience level.



# Reshaping IMS for Today's Mainframe

The last time you swiped a credit card, processed payroll, made a phone call, or booked a flight, you probably weren't thinking about how critical database management is in everyday life. Recognizing that the speed and accuracy of IMS makes it a mandatory system of record for some of the largest organizations in the world, BMC set out to transform IMS database management in a way that preserves its potential for years to come. Relying on our automation and domain expertise, we created BMC AMI Change Manager for IMS®, which offers a modern graphical user interface (GUI) and streamlined workflows for universal DBAs while preserving access to GEN code for veteran IMS specialists.

As you continue to look for ways to protect your investment and keep your IMS database churning onward through the next 50 years of mainframing, the following steps should remain top of mind:

## 1. Leverage technology in a familiar UX

The hybrid or universal DBA of tomorrow is used to innovation at their fingertips. These up-and-coming DBAs are the first generation that grew up not knowing the world before the internet. For them, it has always been there, ready to help answer a trivial question or solve a complex problem. These universal DBAs will seek out technology and good processes to help them excel in their roles, and they'll look for creative ways to apply familiar user interfaces to new areas.

With the right tools narrowing the skills gap and getting universal DBAs up to speed quickly, you can expect them to excel in unfamiliar environments

and remain with your organization for the long haul. Without these solutions, you'll likely see high turnover rates as universal DBAs fall further and further behind the curve.

## 2. Let technology assist with on-the-job training

To ensure your universal DBAs are prepared to manage your IMS database, you'll need to give them the training they need. BMC AMI Change Manager for IMS® offers an IMS Command Builder feature that makes construction of IMS type 2 commands easy. DBAs start by picking a command verb, and the software displays relevant options. By simply clicking on the desired parameters, a command is dynamically built with help text that explains additional parameters if necessary.

The Schema Viewer and Editor is another tool BMC AMI Change Manager for IMS® uses to train your universal DBAs. The tool enables users to make changes to DBDs and PSBs from the GUI and then displays the corresponding source statements in either DDL or control statement format. For DBAs who want to learn both, the feature includes the ability to toggle between formats, and users can undo changes and revert to the original definition at the click of a button.

## 3. Make what-if scenarios and changes simple

Universal DBAs will never gain the confidence they need to manage IMS if they're afraid to get their hands dirty and make changes. BMC AMI Change Manager for IMS® reduces risk and encourages experimentation by allowing easy reversal of any changes to the IMS environment.

An Impact Analysis feature (Analyze Changes) helps define the impact of a proposed change before it's made, and a Cross Reference Reporting feature provides online reports that display relationships between DBDs and PSBs, information in the IMS catalog, and catalog definitions, mitigating the risk that a change impacts IMS objects outside the intended scope. The Change Job Generation function creates four jobs to implement specified changes that perform the necessary change actions, and it also includes a job to undo changes so DBAs can easily back out of them if necessary.

#### 4. Account for the experienced DBA, too!

Your most experienced DBAs are likely nearing retirement age, but that doesn't mean they can't continue to provide value to your organization. Data illustrates that remote work arrangements increase retention for **95 percent of employers that implement them**, and even before COVID-19

put working from home squarely in the spotlight, **98.6 percent of Millennials and Baby Boomers surveyed** thought the practice should be a standard option in positions that are conducive to it.

According to pre-pandemic research by Global Workplace Analytics, 36 percent of retirees would have **considered putting off their retirement** if they had been given the option to work remotely. Now that the economic impact of the coronavirus has devastated the investments of workers on the cusp of retirement, that figure is likely significantly higher. It could take several years for portfolios to recover, and many of your critical DBAs will jump at the chance to extend their employment with your organization if they can do it from the comfort of home.



# Conclusion

The Information Management System has stood the test of time, and your IMS database isn't going anywhere anytime soon. In fact, the growing demand on businesses to process more data at a greater pace—and with fewer people—means that IMS is likely to continue to underpin the latest and greatest technologies.

To protect your IMS investment and ensure its longevity, you'll need to arm the next generation of universal DBAs with the tools they need to succeed while still accounting for the experienced DBA, and BMC AMI Change Manager is built with both personas in mind.



## For more information

To learn more about how BMC AMI Change Manager for IMS<sup>®</sup> can help maintain the continued contributions of your IMS database, visit [bmc.com](http://bmc.com)

### About BMC

From core to cloud to edge, BMC delivers the software and services that enable over 10,000 global customers, including 84% of the Forbes Global 100, to thrive in their ongoing evolution to an Autonomous Digital Enterprise.

**BMC—Run and Reinvent**

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