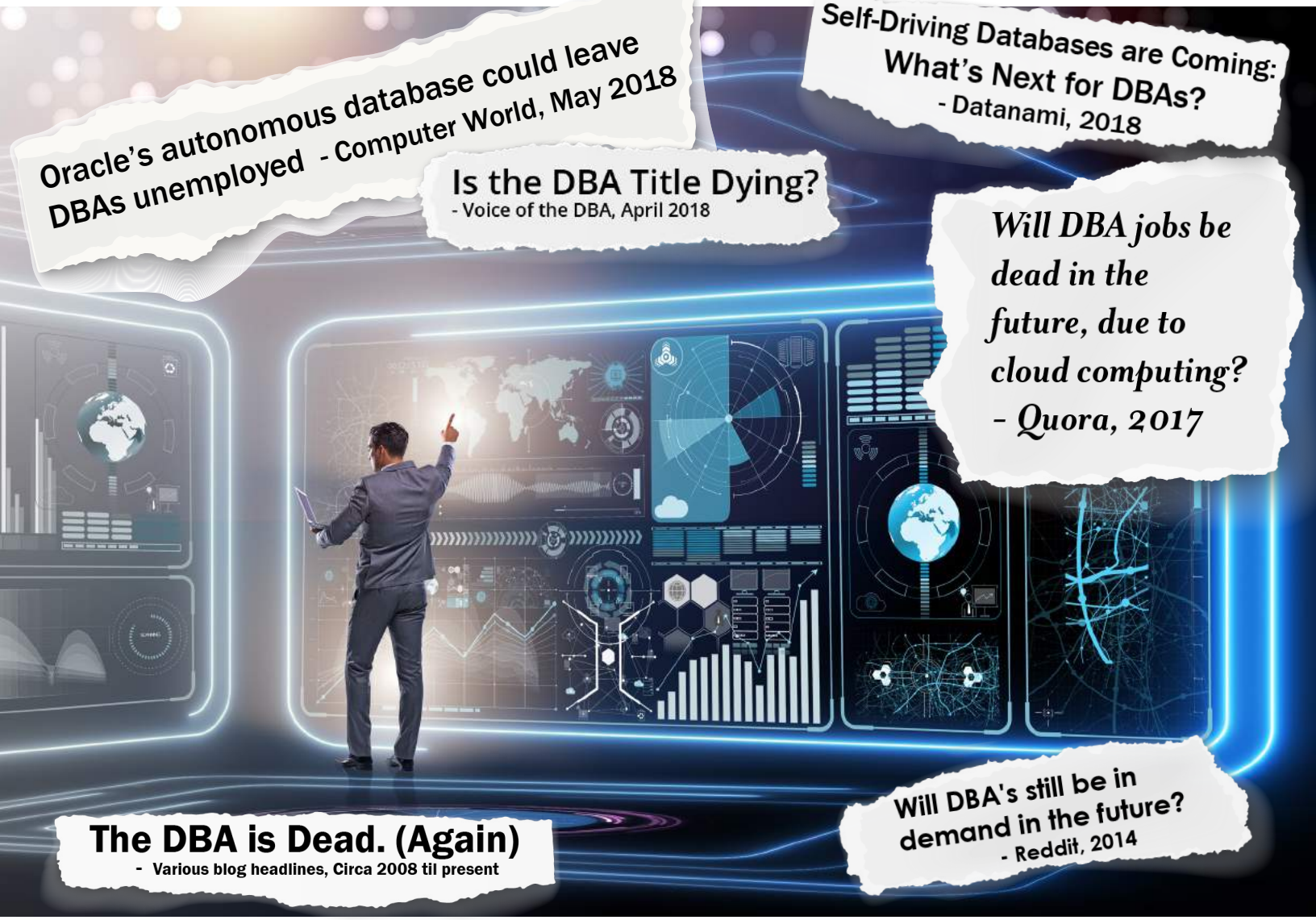
The DBA's Fear-Free Guide to
The Future of Database Administration



What's Inside? Cut through the DBA Noise:

- See data that shows demand for DBAs will continue to outstrip supply for the foreseeable future
- Learn how autonomous database technology will help to simplify increasingly complex DBA work
- Read how the transition to self-driving databases will likely be at a moderate speed for years
- Explore how the DBA role is being elevated by the increasing volume and complexity of data infrastructure

Vigilant TECHNOLOGIES

Data. Data. Everywhere.

What are DBAs so Worried About?

"There is an incredible shortage of IT professionals on the planet earth."

— Larry Ellison
Chief Technology Officer
Oracle

DBA — Still One of the Best, Most Secure Jobs Around

When it comes to being a DBA, it may feel like the best of times and the worst of times.

Database administrators have long been ranked as one of the best jobs in America for pay — with a national median salary of $87,020 — as well as security, work-life balance and stress.

But the hopes of DBAs have been sliding down the rungs as many fret about the future — anxious about digital technologies and the buzz around self-driving autonomous databases from Oracle, which houses half the world's data.

Is the fear really warranted? What should DBAs be doing to future-proof their careers? What can we learn about how automation has affected other occupations? At Oracle Open World 2018 in San Francisco, hundreds of IT professionals packed into a "DBA Versus Autonomous Databases" session at Moscone Center to try and sort it all out.

During his keynote address at the event, Larry Ellison, the Executive Chairman, Chief Technology Officer and Co-founder of Oracle, scoffed at the notion of displacing demand for DBAs. Even as he explained how the new autonomous databases would be self-provisioning, self-scaling, self-tuning, and self-securing, with automatic backup and recovery — among other features that would reduce the need for IT labor.

"By moving to the autonomous database, does that mean all your database administrators are going to be out of work? Not hardly," Ellison said with a smile on his face. "There is an incredible shortage of skilled IT professionals on the planet earth, and it's good if we take away some of the mundane drudgery about running a database. So they can use their talents."

Skyrocketing Data Growth, Too Few DBAs

With 2.5 quintillion bytes of data generated everyday, and the world's data infrastructure growing more complex by the minute, Ellison is right to smile. DBAs would also be justified in relaxing a bit — even as they still ought to plan for enhancing their careers as data professionals to take advantage of a growing number of new opportunities.

This white paper will detail how:

- Growth in the volume of data, and business demands of near-instant visualization and analysis of that data, are making DBAs even more vital to the enterprises they serve
- Autonomous databases will truly assist DBAs in their list of growing demands and challenges
- The role of the DBA is being elevated as data integrations between on-premise and cloud infrastructures grow ever-more complex
- Data strategy, architecture and analysis will become even more vital to the role of a DBA
- A shortage of competent DBAs and other data professionals shows no sign of abating, despite offshoring, continued moves to SaaS applications and self-driving databases

Demand for DBAs is Persistent

No matter how you slice it up, the data pie gets bigger — exponentially bigger — every single day.

The volume of data is growing so ferociously, in fact, that the administration demand it created offset two other massive trends that should have greatly reduced the number of DBAs needed in the United States in recent years.

First, there was a mass offshoring of DBA jobs in an effort to reduce costs — a trend that started two decades ago and continues to this day.

At the same time, the number of Software as a Service or SaaS applications has exploded. These SaaS offerings do not not typically access a company's database, integrating instead with a company's data centers through APIs, or application programming interfaces, thus reducing the demands of a DBA.

Despite these global and wide-reaching shifts, the number of DBAs in the United States grew 38% over the past 20 years, from 82,600 in 1997 to 113,690 in 2017, according to the Bureau of Labor Statistics' Occupational Employment Statistics.

While growth in the number of people employed in DBA jobs in the United States has remained stagnant at about 115,000 for much of the past decade, it still grew 2% over the past five years, and there is evidence to suggest that the slowdown in DBA employment has more to do with the availability of DBA talent, rather than demand for database administration services.

For example, the unemployment rate among DBAs remains below the national average. While the U.S. unemployment rate hit a 50-year low of 3.7% in September 2018, database administrators performed even better, at 3.1%, according to U.S. News

& World Report. In all, computer-related occupations registered an even lower 2.0%, outperforming all but a few categories, such as healthcare and engineering jobs.

The U.S. Bureau of Labor Statistics, which works closely with professional computing and research associations on understanding industry changes for its occupational outlook, continues to forecast a faster-than-average 11% growth rate of DBAs through 2026.

The Complex Data Matrix Expands

Even as clouds and autonomous databases are friendly tools aimed at simplifying data management, data infrastructures still grow more complex by the day.

The reasons for this complexity are many, but much of it has to do with the challenge of large enterprises transitioning to cloud computing.

Hybrid Data Storage Increasing

The No. 1 data management strategy for enterprises in the foreseeable future is a hybrid strategy with data housed in a web of on-premise data centers and public cloud environments.

It's a strategy that best takes into account practical considerations, such as the volume, type, age and sensitivity of the data sets being managed. But another leading reason for this approach is simply financial.

Companies have invested a tremendous amount of resources in their databases and data centers. "Sweating" those assets, or using them to their full advantage, as they depreciate — and even more so after they are fully depreciated — makes a lot of financial sense.

So even as businesses increasingly move to the cloud, where they will pay to store an ever increasing amount of data, they are moving the cloud at a methodical pace — incentivized to extract as much value possible out of their existing data center assets.

What's more, many enterprises are also diversifying their datasets among different cloud providers in a multi-cloud strategy. Some platforms may simply be a better fit for certain types of data, based on how the data is being used and how the cost is calculated by the cloud provider.

Many enterprises also still find themselves learning the real operational and cost differences between cloud providers, given that cloud computing remains relatively young. There are different ways of charging for cloud computing, for example, such as volume of data stored, processing workload and some even charge for removing data to move it to another provider. Some of these cloud "surprises" have companies spreading their bets among several providers, in addition to taking their time.

Cloud Computing Still Maturing

While entrepreneur Sean O'Sullivan filed a trademark on "cloud computing" in 1997, the concept really took off after Google CEO Eric Schmidt introduced the idea to the masses in 2006 at a conference. AWS was the first to market with a modern cloud infrastructure service when it launched Amazon Elastic Compute Cloud in August, 2006. Surprisingly, it took several years before a competitor responded.

Hybrid Storage Expected for Decades

Data Strategy Growing in Importance

Strategizing about what data to put where, or when to migrate to the cloud — not to mention which cloud — requires a high level of knowledge about security, features, applications and integrations, not to mention cost.

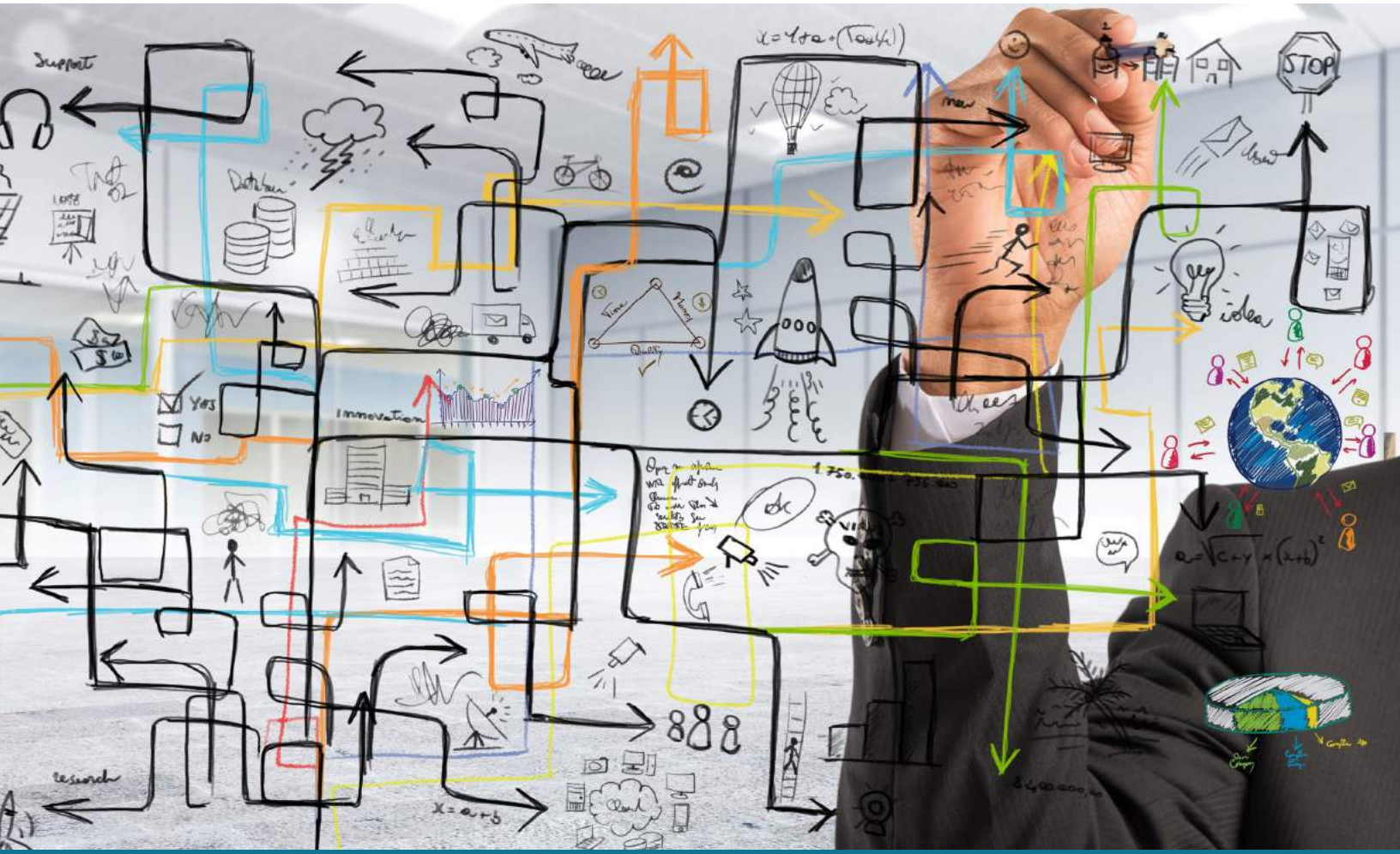
DBAs may be better suited than anybody to manage the data storage strategy and the associated costs as the amount of data continues to explode.

What's more, there will be plenty of other challenges and decisions to be made: Is the data being stored structured or unstructured? Should all data really be stored? If so, for how long and on which service? What is the data purge strategy in this environment of constant and voluminous data creation?

As mind-blowing bytes of data are created every day in every business, there is a never-ending web of challenges like these that must be addressed by skilled data professionals.

Autonomous databases will actually help DBAs with many of these routine tasks, preventing them from, say, getting calls in the middle of the night or having to troubleshoot issues during the weekend or apply routine patches for the umpteenth time.

While these self-driving databases will simplify the task of storing, securing, sharing and processing data, overall data management is not likely to ever be simple or completely anonymous. Just because a company's DBAs have kept the traditional databases operating 99% of the time, doesn't mean the task behind the scenes has ever been easy.



High Data Expectations Fuel New Opportunities

In this modern era, business managers and leaders expect the data that fuels their businesses, apps and analytics to be instantly available and usable for driving the business. Financial, inventory and other data is expected to be as updated and "live" as possible, with no variation from the official end-of-quarter figures, and traceable to the source.

What's more, all of this data must be secure. Companies have grown highly sensitive to the public relations disasters that can result from a data breach, not to mention the financial exposure.

- Retail giant Target in 2017 agreed to pay an $18.5 million multistate settlement as a result of its 2013 data breach that affected 41 million credit card accounts.
- In a filing with the U.S. Securities and Exchange Commission in early 2018, Equifax acknowledged that a data breach affecting more than 145 million consumers included their Social Security numbers.
- In the past two years, at least two dozen major companies have reported consumer data was breached, including Macy's, Delta Airlines, Best Buy and Panera Bread.

The growing list of data breaches is being continuously visualized online by Information is Beautiful: https://tinyurl.com/databreachcloud

In this environment, the role of those who keep, protect, integrate and strategize "all things data" is growing more — not less — important.

So while there may be few standard routine tasks for a DBA to do in Oracle's self-driving database, there are still plenty of other tasks to do. The database, for example, currently sends messages to an admin that can really only be understood by a DBA. Knowing how to work with the Oracle Autonomous Database, just like any other database, could become a valuable skill in and of itself.

The Future is Full of High-End Data Occupations

Understanding business applications and their data integrations will be a key way for many DBAs to leverage their data knowledge and increase their relevance in the changing data landscape.

Meanwhile, a host of new opportunities are coming to the fore:

No. 1 Data Scientist.

For the third year in a row, data scientist has been the top job in America, according to Glassdoor's 2018 list. There is high demand, a high median salary of $110,000 and high job satisfaction.

Responsibilities

- Mining complex data and providing systems-related advice to the business
- Design new ways to incorporate vast information into the enterprise systems
- Work with teams of IT professionals to manage statistical data
- Create different models based on the needs of their company.
- Transform information into actionable research and plans

Requirements: Advanced analytical skills. Exceptional oral and written communication abilities.

This is a Job For ....

Human DBA or Autonomous Database

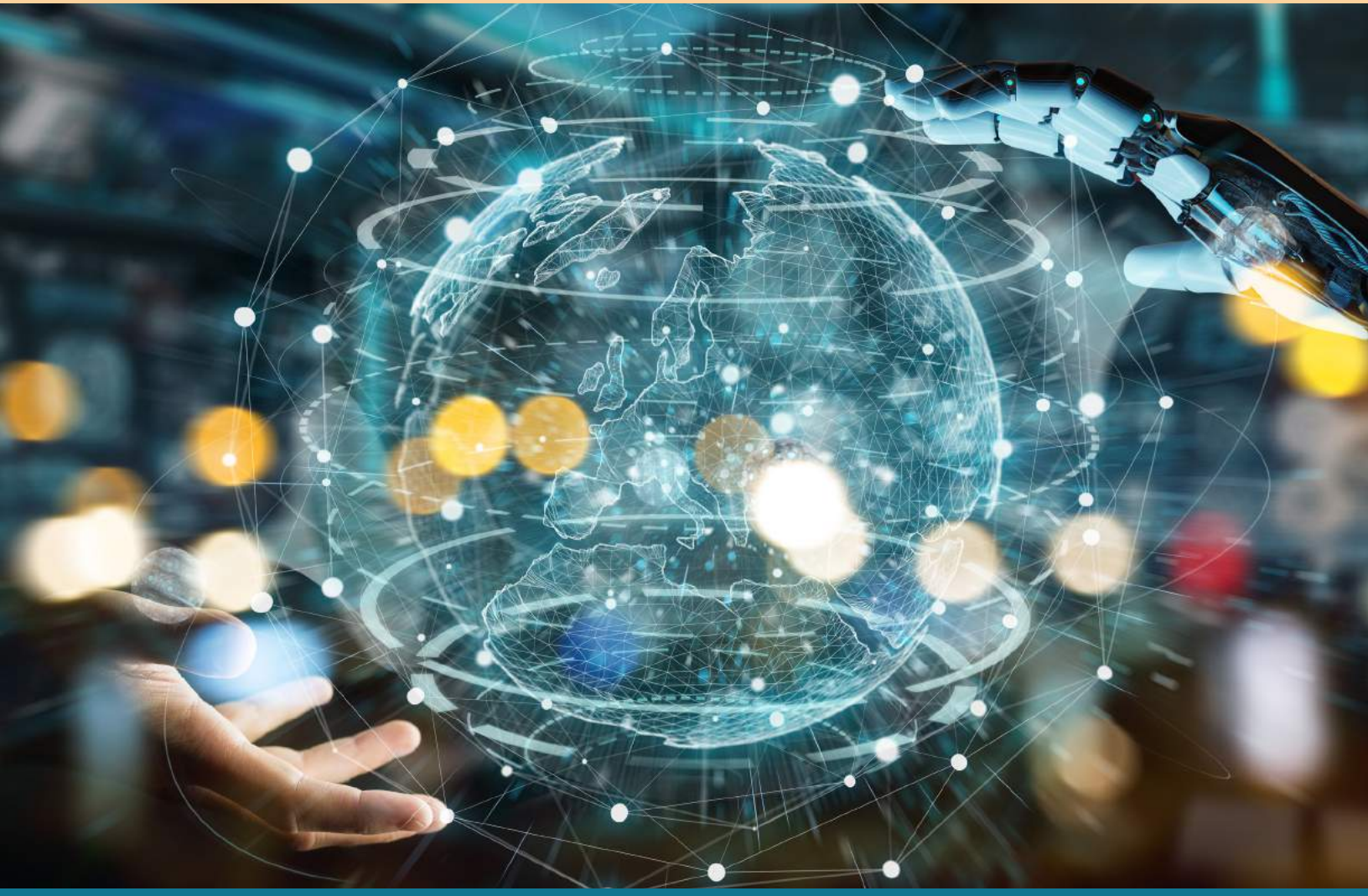
Managing databases will be a shared responsibility in the future. Who should do what?

Human DBAs

- Focus on app design and integration
- Spend more time on data model enhancements
- Focus more on the database architecture
- Spend more time with developers and line of business
- Focus on any other task that can benefit from a proactive approach e.g. plan capacity, eliminate systemic issues
- Monitoring the cost of data storage

Autonomous Database

- Backing up the database
- Monitoring the database
- Automatic SQL tuning
- Patch deployment
- Upgrades
- Space management, provisioning
- Tuning



Data Engineer

No. 33 in Glassdoor's top job rankings. With a $100,000 median base salary, and 2,816, this role also boasts above average job satisfaction.

Responsibilities

- Developing and translating computer algorithms into prototype code
- Maintaining, organizing, and identifying trends in large data sets.
- Data warehousing and querying, schema and data management, and more.

Requirements: Proficiency in SQL database design. Experience creating process documentation. Strong written and verbal communication skills. Familiarity with python, java, kafka, hive, or storm may be required. Ability to work independently.

Data Architect

Payscale lists a average salary of $113,128.

Responsibilities

- Design, structure, and maintenance of data, usually organized in a relational database.
- Ensures the accuracy and accessibility of data relevant to an organization or a project.
- Manage and organize data

Requirements: Advanced skills with computers and proficiency with data-oriented computer languages such as SQL and XML.

"Data has enormous value and the importance of the DBA isn't going away. But their role is changing."

Penny Avril, VP of Database Product Management, Oracle

Conclusion

While new technologies continue to streamline and reduce the work of database administrators, those new efficiencies are being offset by the unrelenting growth of data and the new challenges that volume creates.

Even as undeniable changes are underfoot for Database Administrators, they should take comfort in the fact their knowledge remains more valued than ever. DBAs should take a long-term view of the evolution of their industry because:

- Despite massive global trends that should have reduced demand for DBas — such as off-shoring and SaaS applications — demand for DBAs remains high.
- A flattening of DBA employment levels in recent years appears to be driven by the continued shortage of DBAs relative to demand.
- Unemployment among DBAs remains below the national average.
- Although it has slid in the rankings, DBA is still ranked as a leading profession (No. 26) for salary and job satisfaction by Glassdoor.
- DBAs can further secure their worth by learning new data analysis and administration skills that are complimentary to their existing knowledge, as well as master oversight of new autonomous tools.
- DBAs that master knowledge around cloud platforms, their costs and different features, could also enhance their value as companies contemplate where to store certain datasets and how to migrate them with their business.

Thank you for reading.

For Assistance with your Remote DBA Needs, call Vigilant at 1-888-290-9424.

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