Constellation
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BLOG POST

Oracle Boosts Developer Velocity with Autonomous JSON Database

More Time to Code, Less Time Lost on Admin/Ops

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INTRODUCTION

Oracle introduced a new offering of its technology stack on August 13, 2020: Autonomous JSON Database. Autonomous JSON Database joins the growing autonomous product family at Oracle, which already includes the Oracle Autonomous Database, Oracle Autonomous Linux and Oracle Autonomous Data Guard.

This blog post looks at Oracle Autonomous JSON Database's impact on developer productivity and how the new offering can boost a key developer satisfaction driver: velocity.

WHY DOES DEVELOPER VELOCITY MATTER?

The overused headline "Software Eats the World" usually omits the fact that a lot of developer "blood, sweat and tears" are behind the software that powers enterprises' next-generation applications.

And as the demands for building more software ramp up, the complexities of the associated technology stacks grow even faster. Luckily, there is more training and learning available for developers; unfortunately, though, there is typically less training time available. Today, it is important to understand that the creation of the DevOps function has not insulated developers well enough from nonproductive work. Simply put, DevOps teams are as overwhelmed as developers in trying to keep the software-powered revolution going. Meanwhile, legions of developers have come to understand that when they cannot learn new technologies on the job, they need to learn new capabilities on their own time and dime. And while some of that gives developers the much-needed freedom to explore, learn and tinker, it may constrain their long-term marketability.

At the end of the day, what matters is how fast developers can provide good code that aligns with both the specification and performance requirements of the application in production. The concept of developer velocity is relatively new, but the term aptly describes the demand that is now put on developers. Meanwhile, it is important to understand that developer velocity is situational and is based on experience, training, know-how and general talents. So, developers who strive to remain good, or even become better, are pressed to increase their maximum velocity with additional training and education (see Figure 1).

Figure 1. Developer Velocity Defined

$$\text{Developer Velocity} = \frac{Working\ Lines\ of\ Code\ in\ Production}{Time}$$

Source: Constellation Research

Finally, the key determinant of developer velocity is the time available to code. The more time that developers have to write, review and test code, the more productive code they can deliver. For decades, the focus has been to improve developer productivity when they code. And that is a key factor, but even more potential can be derived by giving developers more time to code. This means the elimination of noncoding tasks. Associated noncoding time spent needs to be examined and, ideally, reduced to a minimum.

One of the key perils of the developer job is that when new technologies are involved in a project, the developers often become the first ones in an enterprise to master the operation of the overall technology. That is natural, as they deal with the technology first and—initially, at least—the most. Unfortunately, though, all too often they are drawn into long-term managing, maintaining and scaling operational tasks around the technology of their projects. Developers too often step into the "experience trap"—the capture of the most experienced resources on operational tasks keeping them from their real job: writing and reviewing code.

And while developers are obliged to do their part to not get caught in the perils of the developer job or the experience trap, their enterprise also has to empower them to use platforms that avoid both challenges, through inherent capabilities. Recent innovation in the self-driving or autonomous product category makes this possible.

## WHAT IS THE ORACLE AUTONOMOUS JSON DATABASE SERVICE?

Oracle has been steadily building out its autonomous software road map, having released Oracle Autonomous Database, Oracle Autonomous Linux and Autonomous Data Guard. Now the Autonomous JSON Database joins the family of autonomous products.

Specifically, Oracle Autonomous JSON Database is a cloud service that addresses the JSON developer community. It uses native JSON storage and is a fast and scalable service, using Oracle Cloud Infrastructure (OCI). Most importantly, it allows use of both non-SQL, document-centric code assets and SQL-centric code assets, and it provides simple document APIs for programming languages via REST or the command line interface. Contrary to widespread expectations regarding an Oracle Database product/service, SQL is not required to use the Autonomous JSON Database (see Figure 2).

There have been long debates regarding the right way to access document-centric JSON databases. Oracle is taking a balanced approach, allowing developers to access the Autonomous JSON Database service as they prefer, either with a document-centric language via Simple Oracle Document Access (SODA) or via SQL.

SODA is an easy-to-learn language construct that plugs into popular Java, JavaScript/Node.js, Python, PL/SQL and C programs (and more via language drivers or RESTful web services). For the SQL camp,

Figure 2. Autonomous JSON Service
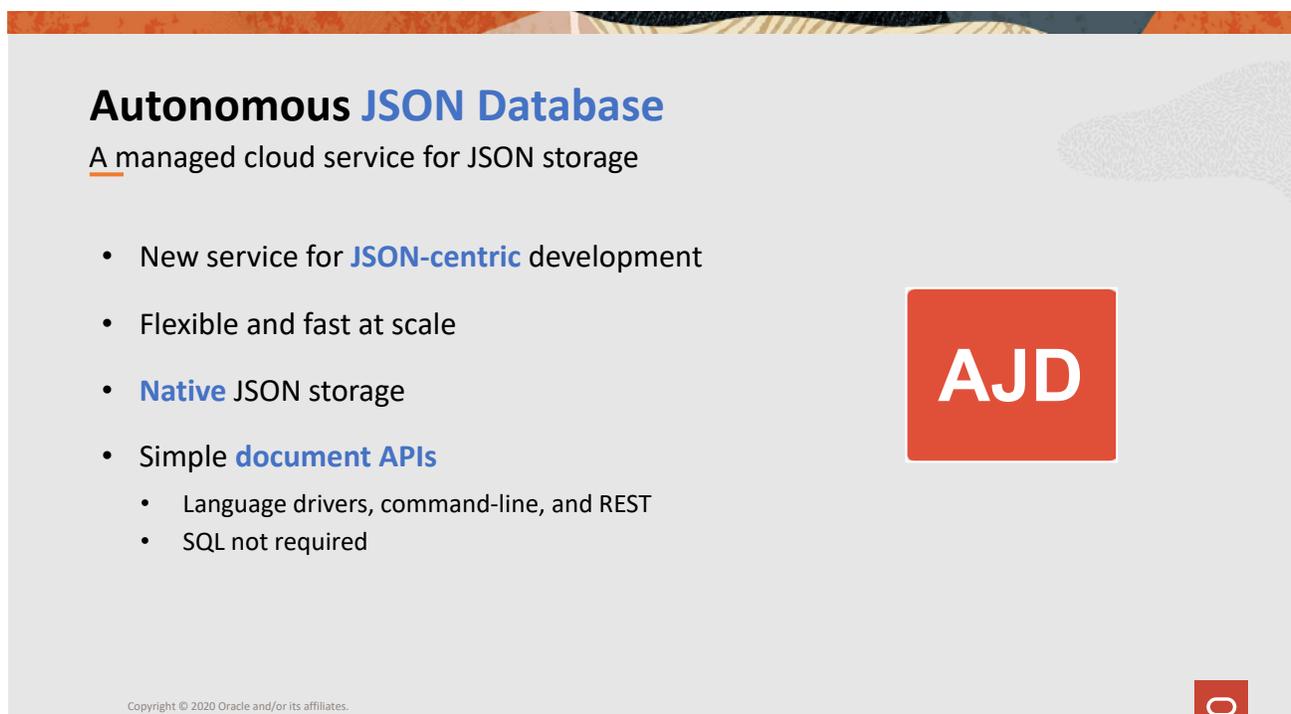
Autonomous JSON Database
A managed cloud service for JSON storage

- New service for **JSON-centric** development
- Flexible and fast at scale
- **Native** JSON storage
- Simple **document APIs**
  - Language drivers, command-line, and REST
  - SQL not required

AJD

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Source: Oracle

Oracle provides its proven SQL engine that comes with ISO SQL/JSON support and the command line interface with SQLcl, which allows powerful in-line editing, statement completion and command recall (see Figure 3).

With Oracle having addressed two key developer approaches for creating code for JSON-based next-generation applications, it has contributed already to developer velocity, literally helping developers to be productive quickly, reusing previously acquired skills.

But this is only half the story: The main value of Oracle Autonomous JSON Database is that it runs on Oracle Autonomous Database, which means that it has all the self-driving automation, availability, scalability, elasticity and pay-per-use model of the Oracle autonomous platforms. Oracle provides the availability that enterprises need for their JSON-centric next-generation applications as well as the scalability and elasticity that JSON-native applications need. Practically, this means developers do not have to worry about taking care of database management (new instance provisioning, automated backup, replication, disaster recovery, scaling and tuning, and so on), and with that they can avoid

Figure 3. How Oracle SODA Plugs into Important Popular Programming Languages
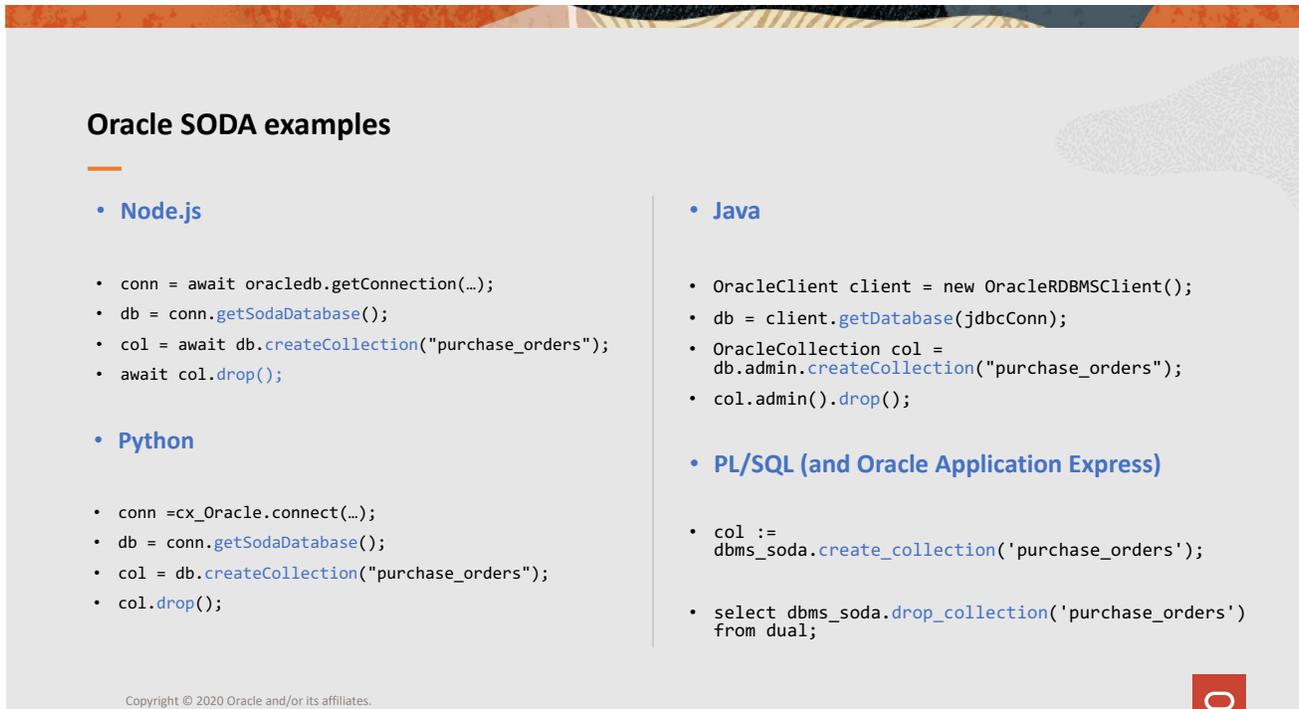
Oracle SODA examples

- **Node.js**

```
conn = await oracledb.getConnection(…);
db = conn.getSodaDatabase();
col = await db.createCollection("purchase_orders");
await col.drop();
```

- **Python**

```
conn =cx_Oracle.connect(…);
db = conn.getSodaDatabase();
col = db.createCollection("purchase_orders");
col.drop();
```

- **Java**

```
OracleClient client = new OracleRDBMSClient();
db = client.getDatabase(jdbcConn);
OracleCollection col =
db.admin.createCollection("purchase_orders");
col.admin().drop();
```

- **PL/SQL (and Oracle Application Express)**

```
col :=
dbms_soda.create_collection('purchase_orders');

select dbms_soda.drop_collection('purchase_orders')
from dual;
```
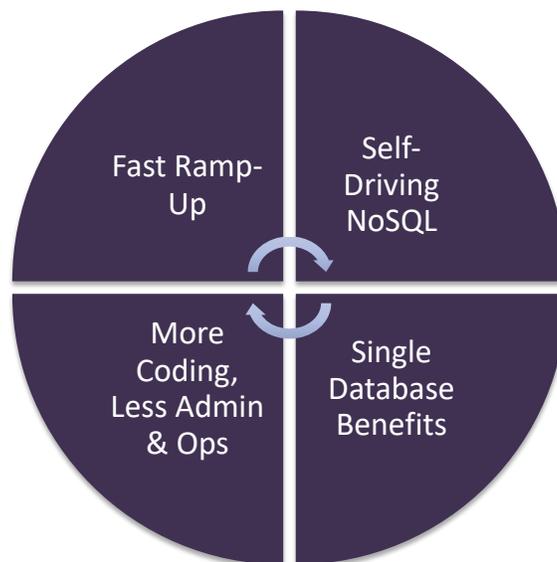
Source: Oracle

the "talent trap." With little to no DevOps resources and skills needed, developers will not be stuck supporting JSON databases. In these capabilities lie the real advantage for developers using Oracle Autonomous JSON Database: It allows developers to increase time available for developing code, and to spend less time on "plumbing," thus gaining greater developer velocity.

WHY IT MATTERS FOR DEVELOPERS

Developers want to create and maintain successful code in applications that make a difference for their enterprises. With the Autonomous JSON Database, Oracle delivers four key qualities that improve the developer's experience in this regard (see Figure 4):

1. **Fast ramp-up.** Developers can use both SODA and SQL with the Oracle Autonomous JSON Database and mix and match between the two, depending on the use cases. With support for the ISO SQL/JSON standard, and with SODA being close in composition to other popular document APIs, developers can become productive quickly.

Figure 4. Developer Benefits of Oracle Autonomous JSON Service

Source: Constellation Research

2. **Self-driving NoSQL.** Oracle autonomous qualities benefit the Autonomous JSON Database. Therefore, auto-scaling, backup, cloning and more are easily achieved. Relieved of such administrative requirements, developers can code with no outage or impact on their applications.

3. **Single database benefits.** Oracle's universal database approach brings all relevant information together, not only the relational system of record information on the Oracle Database but also the nonstructured, document-oriented NoSQL data with Oracle Autonomous JSON Database. Developers who understand Oracle Database don't have to learn anything new to use Autonomous JSON Database.

4. **More coding, less admin and ops.** To achieve higher velocity, developers need to have more time to code and less time consumed by administrative and operational tasks. Oracle Autonomous JSON Database delivers on that, with all the qualities of the Oracle autonomous technology stack.

ADVICE FOR JSON DEVELOPERS

Constellation has the following recommendations for developers regarding Oracle Autonomous JSON Database:

1. **Accept the automation imperative.** Progression in technology, most notably Infinite Computing,[1] allows the automation of more routine and advanced tasks than ever before. Developers need to realize that their work environment will change more in the next 10 years than it has changed in the last 25. Developers who take advantage of autonomous self-driving capabilities earlier will increase their developer velocity and be more successful.

2. **Evaluate Oracle Autonomous JSON Database for NoSQL demands (existing Oracle customers).** Suite-level benefits are strong, especially when it comes to the platform-as-a-service (PaaS) layers (in this case, the database). If a developer is already using the Oracle Database, then the synergistic effects of the Oracle platform make Oracle Autonomous JSON Database very attractive.

3. **Conduct a cost-benefit analysis for a potential switch to Oracle Autonomous JSON Database (Oracle prospects).** Oracle has a multiyear lead on PaaS competitors when it comes to building an

autonomous platform, starting with its flagship RDBMS product, the Oracle Database. As Oracle adds autonomous offerings (for instance, Oracle Autonomous Linux and, now, Oracle Autonomous JSON Database), the labor savings and developer velocity advantages of the platform become worth the consideration by non-Oracle customers.

4. **Prioritize developer velocity.** As Enterprise Acceleration[2] is travolging[3] enterprises, developers find themselves as the key enablers of the software-driven enterprise. Developers who can show higher velocity than their peers will do better.

5. **Consider Oracle Autonomous JSON Database for next-generation applications.** All seven of the universal next-generation application use cases require JSON skills to be successful.[4] Developers interested in building next-generation applications need to look for NoSQL/JSON offerings that will make their development success more likely. Oracle Autonomous JSON Database has the potential to deliver on that, and therefore merits a closer look/evaluation.

6. **Understand and avoid the time sinks that developers step into.** Developers need to continuously monitor where they spend their time—humankind's most precious resource. But as all engineers, including developers, are measured on outcomes, developers need to be more acutely aware of how they actually spend their time. Conversely, good developers will be constantly on the lookout for offerings that free up more time for coding and increase their developer velocity.

MYPOV

Developers need to think more about themselves, even to the point of becoming selfish. Technology advancement has accelerated, and the expertise and learning options available a few years ago are no longer keeping developers skilled to the level where they want to be and should be.

At the same time, days have not gotten longer than 24 hours, so it really is up to developers to determine how they can get the most out of their time. Adding more admin/ops skills is not the best choice. It is true that new technologies are always interesting and often fun to learn with, tinker with and even build software with. But, all too often, developers get stuck with operating and maintaining

these technologies longer than they should, and they really cannot afford to waste time on supporting technologies that could be automated or that should be supported by others. (DevOps, anyone?)

This realization makes developers effective change agents for their work environment. That is not a new role, as developers have that freedom when it comes to the tools they want to use when they code (e.g., their IDE). But the change-agent role now needs to expand to platforms that do not require developers to be taken "hostage" by platform maintenance and operation needs. The consequence is that developers need to become more active in selecting platforms, something they have not done traditionally.

The good news is that new, modern platforms inherently avoid pitfalls that burden developers with operational, administrative and maintenance demands. One such modern offering is Oracle Autonomous JSON Database, which minimizes operational and maintenance demands on anyone—whether they are developers or DevOps staff. The result of using platforms with autonomous qualities is that they improve the developer experience: Developers can spend more time coding and/or more time learning, increasing their skills, relevance and marketability.

ENDNOTES

1 *For more on Infinite Computing, see: Holger Mueller, "The Era of Infinite Computing Triggers Next-Generation Applications," Constellation Research, June 1, 2018.* https://www.constellationr.com/research/era-infinite-computing-triggers-next-generation-applications

2 *For more on Enterprise Acceleration, see: Holger Mueller, "Next-Gen Computing: The Enterprise Computing Model for the 2020s," Constellation Research, September 14, 2018.* https://www.constellationr.com/research/next-gen-computing-enterprise-computing-model-2020s

3 *This is the author's signature verb, anglicized from the Italian "travolgere," as the English language does not have a corresponding word. It means the active/passive change of something at a pace faster than organic but slower than disruptive.*

4 *For more on next-generation applications and the seven use cases see: Holger Mueller, "Why Next-Gen Apps Start with a Next-Gen Platform as a Service," Constellation Research, April 5, 2018.* https://www.constellationr.com/research/why-next-gen-apps-start-next-gen-platform-service

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Prior to joining Constellation Research, Holger was VP of products for *NorthgateArinso,* a KKR company. He led the transformation of products to the cloud and laid the foundation for new business-process-as-a-service (BPaaS) capabilities. Previously, he was the chief application architect with *SAP* and was also VP of products for *FICO.* Before that, he worked for *Oracle* in various management functions—both on the application development (CRM, Fusion) and business development sides. Holger started his career with *Kiefer & Veittinger,* which he helped grow from a startup to Europe's largest CRM vendor from 1995 onwards. Holger has a Diplom Kaufmann from University of Mannheim, with a focus on Information Science, Marketing, International Management and Chemical Technology. As a native European, Mueller speaks six languages.

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