erwin® by Quest

Application Development Is New Again

Realizing value from app development in the age of digital transformation requires strong commitment to data modeling and governance

Learn more at **erwin.com**

Real-time, Market-Differentiating Applications Rule

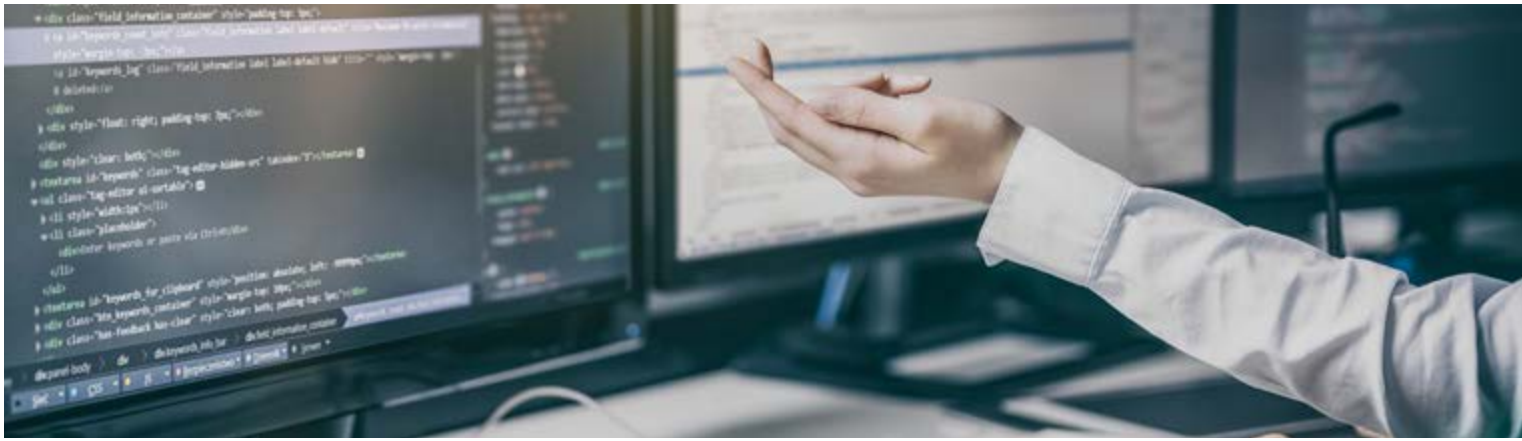
DIGITAL TRANSFORMATION SPENDING

$6.8 trillion worldwide
by end of 2023

Source: IDC Worldwide Digital Transformation Predictions

No matter the industry, any organization embracing digital transformation recognizes that developing unique applications is core to driving its business forward. The focus on delivering innovative solutions that often are customer- or partner-facing is a remarkable departure from past practices when application development targeted tactical, internal business functions—before prepackaged on-premises systems and ultimately cloud-based SaaS tools took over that market.

Application developers can't help but be excited by the turn of events toward digital transformation and are embracing the opportunity to play an increasingly important role in achieving business goals. They're inhabiting a new world of development, one where the business calls on them to create solutions that tend to be real-time and mobile. These services likely draw upon analysis of large volumes of integrated data of diverse types (unstructured, semi-structured and structured) to support end users, whether providing them with personalized on-the-spot product recommendations, up-to-the-minute stock market portfolio values, or individual patient insights across the healthcare continuum.



As application development becomes the business, companies want to present their persona to constituents via solutions that highlight their particular expertise in products, services or other capabilities. Some of the biggest names in their industries are tuned into the need to fuel the development of demanding cutting-edge apps for that purpose. In the financial services sector, for example, JPMorgan Chase spent $600 million on emerging fintech solutions in 2016 and continues to aggressively pursue developing digital banking and fintech products. That includes mobile and online tools that let consumers open accounts and complete transactions, automated investment advice and self-directed investment apps, and electronic trading and online cash management services.

Real-time, Market-Differentiating Applications Rule

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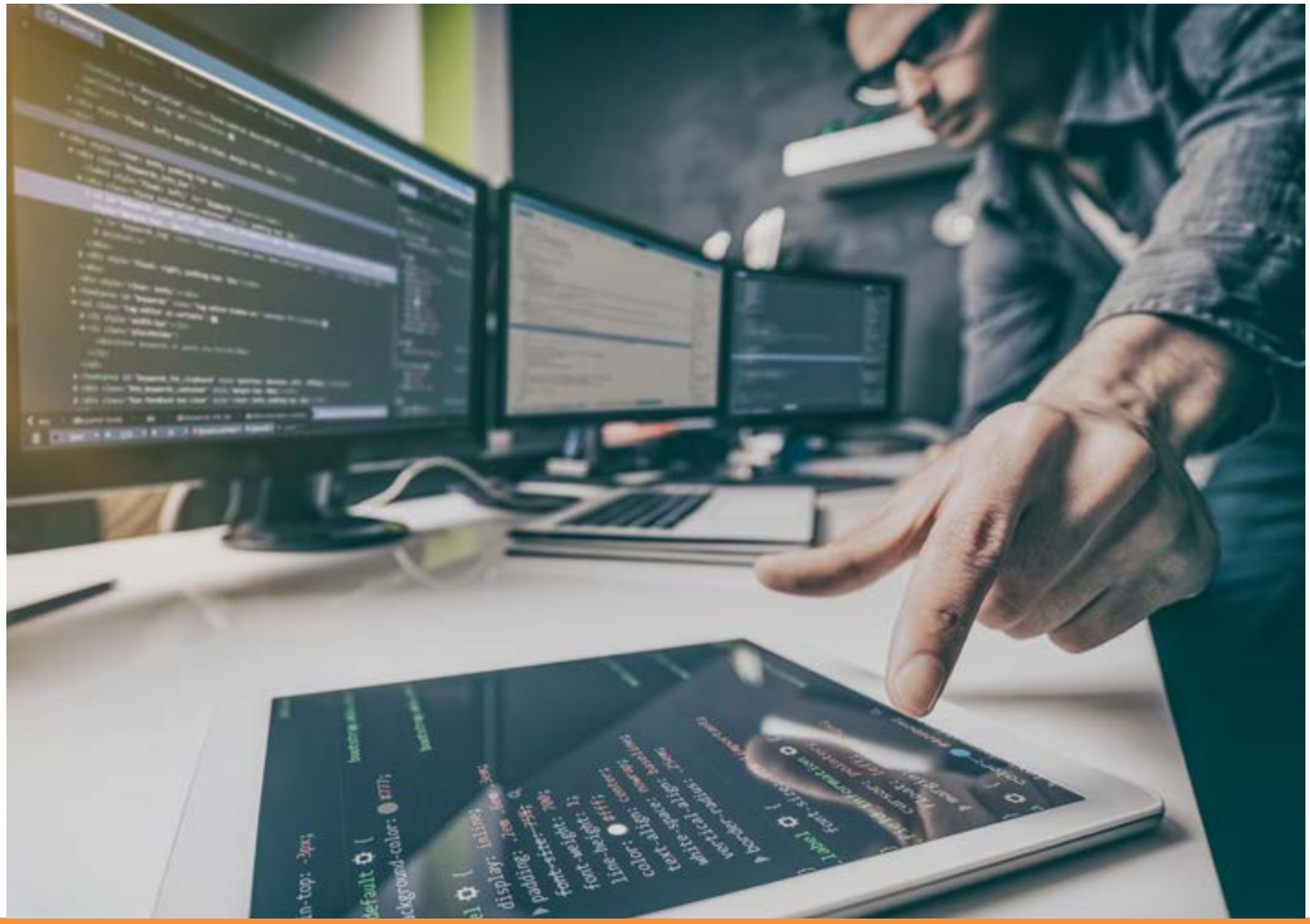
"The reasons we invest so much in technology (whether it's digital, big data or machine learning) are simple: to benefit customers with better, faster and often cheaper products and services, to reduce errors and to make the firm more efficient," chairman and CEO Jamie Dimon wrote in his annual letter to shareholders. The following year, he noted that of the nearly 50,000 people in technology at the company, more than 31,000 are in development and engineering jobs, and more than 2,500 are in digital technology.

As many companies are finding, however, achieving success in developing market-differentiating applications to create more intimate relationships with an audience requires adopting a different organizational paradigm; leveraging non-relational database technologies; building another level of development expertise; and driving optimal data performance. It must be done, too, while remaining invested in data governance, backed by data modeling, as the force behind accurate, empowering real-time analytics and business intelligence efforts.



Reasons to Adopt Agile

Accelerating software delivery and enhancing ability to manage changing priorities remain the top reasons stated for adopting Agile. Respondents indicated in 2020 that reasons for adoption were less about reducing project cost (26% compared to 41% last year) and more about reducing project risk (37% compared to 28% last year).

Source: 14th Annual State of Agile Report

NOSQL MARCHES FORWARD

$4.2 billion:

Expected value of NoSQL market expected to reach $22.08 billion by 2026

Source: Allied Market Reseach

PREPARING THE DEVELOPMENT ORGANIZATION FOR ALL THIS REQUIRES IDENTIFYING WHAT AND HOW PROCESSES, SYSTEMS AND EVEN JOBS WILL EVOLVE. CHIEF FACTORS IN THESE EVOLUTIONS INCLUDE:

Agile development. There's little if any time for the linear waterfall model approach to development these days. Rapid delivery is the rule rather than the exception, characterized by releasing usable product increments in sprints as part of an ongoing and iterative development process.

To keep application development on the agile development acceleration curve, the traditional approach that puts physical modeling behind logical data modeling—performing entity-relationship diagramming (ERD) to articulate relationships across components and assist in defining workflows—is turned around. Instead, developers move from conceptual models for defining high-level requirements to creating low-level physical data models to be incorporated directly into the application logic. Taking this route facilitates dynamic change support to drive speedy baselining, fast-track sprint development cycles and quick application scaling. Logical modeling comes on the heels of these efforts.

Skills transformation. Agile application development typically goes hand in hand with using NoSQL databases that enable developers to take advantage of more pliable data models. That technology provides a dynamic and more flexible schema design than relational databases with support for whatever data types and query options the application requires, efficiency in processing, and scalability and performance that suits big data and new-age applications' real-time requirements.

In many organizations, the skills to work with these new databases still aren't widespread, and staff familiar with managing RDBMS technology won't necessarily find them intuitive to adopt. Tools that are specifically directed at helping organizations model the unstructured data in the NoSQL databases that prop up many new-age apps can help support the acquisition of those skills.

Faster querying. The shift to agile development and NoSQL databases as part of more complex data architectures drives another shift: storage-optimized models are moving to the backlines. A new format is needed on the frontlines to support the demands of real-time applications—technology, that is, that provides the foundation for understanding what will be asked of data and that enables schemas to be structured to support application data access requirements for speedy responses to even complex queries.

GLOBAL NOSQL MARKET DYNAMICS

Top NoSQL Drivers:

- Rise in unstructured data
- Attractive business models
- Demand for data analytics
- Growing app development business

Source: NoSQL Market Report, Allied Market Research

Data Governance and Data Modeling Underpin Analytics

The business can't favor agility, speed and flexibility over the need to stringently manage its key data assets, though. Differentiated and high-performance applications backed by NoSQL databases clearly are poised to bring benefits to organizations, but integration of the data contributing to and resulting from these real-time apps is critical to the business being able to use those assets effectively. Without a single, standardized end-to-end view of the customer profile as it evolves, for example, it will be challenging to move ahead with activities such as targeted, real-time cross-selling and upselling apps that track with an individual consumer's changing needs.

Therefore, if the business is to successfully use data sets from diverse sources in the service of real-time application analytics, as well as business intelligence reporting, there can be no holes in data governance. Successful data governance that supports critical integration efforts for production applications will be empowered by capabilities such as cohesive business glossaries, data dictionaries, data catalogs and consistent data exchange across the people, processes and systems that manage and protect data.

The functionality for sharing core data definitions, business rules and data structures across the organization will be enhanced to the benefit of business users and the larger data management picture when the data governance program is built upon a solid foundation. That foundation's first layer is to be found in data modeling for identifying entity types, attributes and associations, regardless of the types of databases they are stored in or where the applications in which they are used reside, and which also offer the capability to remove duplicate data.

Working with the pool of useful data that data modeling creates, logical models then can be developed that depict these entity types, the data attributes describing those entities, and the relationships between them to provide a simple graphic display of coordinated enterprise data elements, each detailed according to its own security, privacy and other requirements. The logical model basically visualizes the databases behind real-time applications in a more "human-readable" view, one that emerges from traditional ERD.

ENTERPRISES AND DATA GOVERNANCE

42% have a fully implemented a data governance program.

58% say their data governance program is evolving, it's an ever-changing tenet of a modern business.

Source: erwin by Quest 2021 State of Data Governance and Empowerment Report

Data Governance and Data Modeling Underpin Analytics

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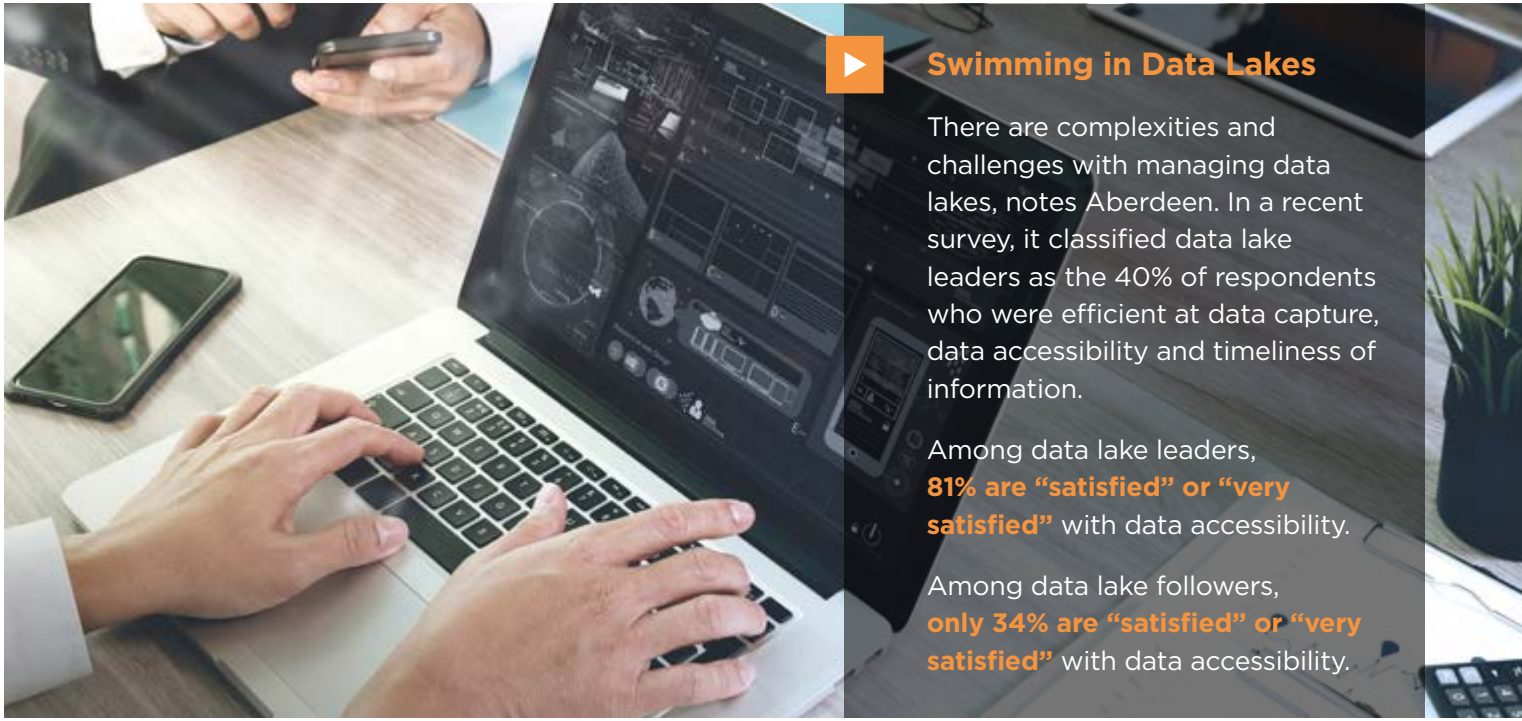
DEFINING A DATA MODEL

Data models are vehicles of communication with human beings. The beings being business people as well as system developers. All need to understand the structure and the meaning of a given context (the scope of the data model).

—**Thomas Frisendal,** author and principal of consultancy TF Informatik

Source: "Talk to me, Data!"—Getting Data Models Right, Dataversity, 2017

Since the agile development processes that are generally relied upon for today's streamlined application development typically skip the logical modeling layer, reverse-engineering must be employed to move from physical to more useful and articulated logical models. Now, with ERD information incorporated into logical models, business users, data management staff and others have better insight into the data elements (and their attributes) involved in a project and how they work together to define business rules and constraints. They also are better equipped to support communications with data analysts.



Source: Angling for Insight in Today's Data Lake, Aberdeen, 2017

Some level of data governance, instituted with the support of data modeling and ERD-driven logical models, also is critical to successfully leveraging the mass of data that may be derived from new NoSQL apps and sent off to reside in Hadoop big data lakes. Data comes into data lakes in its native format, whether structured, semi-structured or unstructured. But with a relational layer, such as Hive, atop the storage volume and strong data modeling tools that underpin data governance, data lake content can be better curated and it becomes easier for analysts across the business to access the right data at the right time for analytics and reporting.

erwin by Quest in the New Application Development Arena

erwin Data Modeler by Quest takes into account all the requirements for the new application development era. Its provision of modeling tools to support agile application development includes reverse-engineering databases to infer their structures and support logical data models that ground the governance of objects, entities, tables, and collections and integration of NoSQL and other data.

With erwin's query-optimized modeling included in the solution, taking over the place once held by storage-optimized modeling, users gained guidance to build schemas for optimal data performance for NoSQL applications. erwin Data Modeler, takes an "any-squared" (Any^2) approach to data management, enabling "any data" from "anywhere" to be visualized for greater understanding. Relational database professionals have profited from the solution's modeling expertise to hone the skills they need in the new world of app dev, as well, where NoSQL skills are lacking.

HOT DATA SKILLS

Source: Brightwing analysis of Dice.com data science tool

The capabilities and professional growth opportunities supported by erwin Data Modeler currently extend to Couchbase, Cassandra and MongoDB. The software's modeling and visualization tools spur productivity and increase adeptness for meeting today's real-time application development demands, supporting legacy RDBMS modernization and navigating standards and compliance requirements.

There's more to the story, too. erwin Data Modeler models for discovery, visualization and analysis can be imported to speedily and seamlessly drive Couchbase, Cassandra and MongoDB data source definitions and designs. It also provides native Hadoop Hive database support to better model and govern the volume of data—much of it derived from real-time NoSQL apps in data lakes—to "round-trip" data visibility across source systems and linkages back out to applications.

erwin by Quest in the New Application Development Arena

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With erwin Data Modeler in place, enterprises will be positioned to deliver unique, real-time and responsive apps that will enhance their reputations among users and support a wealth of new business opportunities related to digital transformation. At the same time, they will be able to preserve and extend the hard work they've already done toward maintaining well-governed data assets. erwin Data Modeler users undeniably will have a head start on competitors in a world where application development is new again.

Take erwin Data Modeler for a free spin.

DATA MODELING: A VALUE POINT FOR EVOLVING DEVOPS

The move to agile development methodologies to foster the development of new-age apps often is accompanied by a move to embrace a DevOps mindset. But many organizations still are working out the details of how development and operations staff will fully participate together in the application lifecycle, from design to production support. In the meantime, data management professionals such as database administrators that design and provision the data platform remain on board to support the operations processes.

In an age when applications are delivered with greater speed and continuous iterations, DevOps evolution is no easy task. But the work businesses are doing may be helped by data modeling that provides a valuable source of understanding from a DevOps planning perspective.

Here's how: This capability provides operations with an easy-to-follow source of information about what is coming down the NoSQL application pipeline to prepare to deliver it. With ERD providing more visual clarification that aids in greater understanding of data elements and their relationships, it becomes possible to smooth data platform planning processes and facilitate DevOps transition requirements. That's a major plus in navigating DevOps speed bumps.

About erwin by Quest

erwin is a leader in enterprise modeling and data intelligence software. The erwin EDGE platform creates an enterprise data governance experience for IT and business collaboration, driving meaningful insights, agile innovation, risk management and business transformation. Integrated data modeling, data governance, enterprise architecture and business process modeling capabilities help guide smart decisions. With erwin, organizations of all types across the globe can maximize the security, quality and value of their assets to control data chaos and prepare for the next IT challenge.

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