Couchbase

IN THE AGE OF CUSTOMER EXPERIENCE, ISN'T IT TIME FOR A NEW DATABASE?

Introducing the Engagement Database – and why it's a vital part of your digital transformation

Executive summary

Digital innovation has irrevocably changed the way we communicate, collaborate, shop, and socialize in the 21st century. Armed with ever-shinier devices and ever-more powerful apps, we now demand consistently better experiences from the brands seeking our attention. As a result, the need for superior customer engagement has itself become a major driver of digital transformation. In fact, we would argue that the ability to deliver exceptional experiences has become the single most important differentiator for enterprises today.

The big question is whether conventional analytical or transaction databases are able to deliver rich customer engagement at scale. By their nature, analytical systems are backwards-facing, while transaction systems are focused on the actual moment of purchase. Yet today, that moment – as well as any repeat purchase – depends on an increasingly lengthy, and increasingly complex, sequence of interactions which need to be executed flawlessly in real time.

Looking ahead, designing and executing brilliant customer engagement requires three important things:

- The ability to respond to fast-changing data, market factors, and business demands
- The ability to scale without performance loss or outages
- And a viable amount of resource necessary to manage it

What's becoming clear is that a dedicated Engagement Database offers significant advantages in every one of these areas.

$2.2 trillion

worldwide investment in digital transformation
initiatives by 2019

Introduction: the drive towards digital transformation

Digital transformation has already disrupted many industries, including retail, media, gaming, travel, and marketing. For example, the rise of streaming media has forced cable television providers to transform or perish. In the travel and hospitality sectors, competition has been ramped up by the likes of Trivago and Airbnb – and incumbents like Sabre and Amadeus, which provide IT services to a majority of airlines, have been forced to adapt.

Even producers of physical goods are racing to disrupt themselves digitally. PVH, the second largest importer of apparel – and owner of brands like Tommy Hilfiger, Calvin Klein, IZOD, and Speedo – is working to transform traditional apparel into connected devices that will replace today's wearable devices that interface with phones to monitor physical activity or sleep. PVH expects connected apparel to be as smart as phones: to be able to see, hear, sense, communicate, store energy, regulate temperature, monitor the wearer's health, and even change color.[1]

The pace of change is extraordinary. According to IDC,[2] worldwide investment in digital transformation initiatives will reach $2.2 trillion in 2019, almost 60% more than in 2016.

Why the urgency with digital transformation? According to strategy research firm Innosight, the average lifespan of a typical company is down from 67 years to just 15 – and at current churn rates, 75% of the S&P 500 will disappear by 2027.[3] Disruption is the primary factor behind this trend: category disruptors like LinkedIn, BD, or Betfair grab the lion's share of a market while the old category leaders watch their customers simply desert them.

As Amazon and eBay continue to innovate their user experiences relentlessly, traditional brick-and-mortar businesses like Tesco, Wal-Mart, GE, and Nike have reacted by "self-disrupting" in an effort to maintain their competitive advantage. With every industry facing impending disruption, organizations are attempting to answer three urgent questions:

- Where are the opportunities – and what are the threats?

- How soon is disruption coming and how big an effect will it have on their business model?

- What's the best self-disruption strategy and how much should they invest in it?

Interactions, experiences and engagement trump transactions

First, let's clear up some terminology:

Clicking on a link, liking a tweet, starting a game, entering a search term, completing a form, hovering on a web button, starting a video, changing its volume, having a conversation with a chatbot, shooting a virtual alien, adding an item to an online shopping cart: these are all interactions. Making an online payment is a transaction. Your interactions on a webpage or mobile app then add up to a customer experience. And the result of successive positive experiences and transactions is engagement.

With that out of the way, the thing to understand about interactions is that we're having more and more of them. In 2016, online travel agencies controlled 39% of the U.S. online travel market, according to Ed Watkins, editor of travel industry researcher Duetto.[4] But as we have limited time and attention,

organizations have to compete to provide us with interactions that are more and more compelling and that add up to a more satisfying experience – which means that customer experience has become a significant competitive advantage.

Not only are we having more interactions, we're having *more interactions per transaction*. Amadeus, the major European IT provider for the global travel and tourism industry reports that the "look-to-book" ratio (the figure the travel industry uses to show the percentage of people who visit a travel website, compared to those who actually make a purchase) has soared to 1,000:1.[5] With the explosion of choices available online, today's customers are spending much, much more time browsing the options than they do actually completing a transaction. And that's true of every digital business: in e-commerce they call it "browse to buy," in digital media, it's "browse to binge," and in financial services it's "scan-and-score to transfer."

Uniquely satisfying interactions have a huge advantage when it comes to turning browsing behavior into purchase. And by following up a transaction with richer and more personalized experiences, you can achieve more profitable customer engagement throughout the lifecycle of the customer relationship.

ENGAGEMENT DATABASE

TRANSACTIONAL DATABASE

ANALYTICAL DATABASE
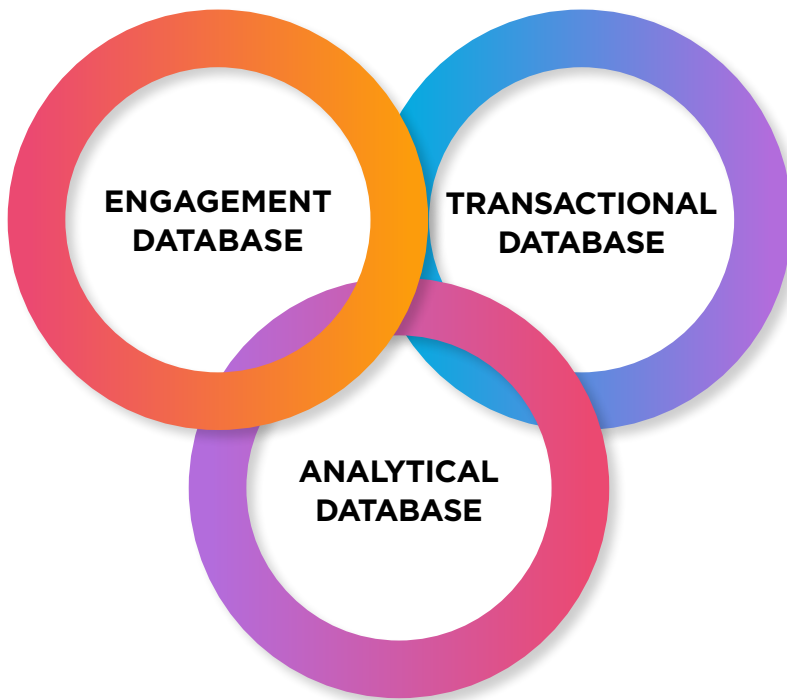
Why transactional and analytical databases fail to deliver exceptional engagement

What many businesses have realized is that requirements for richer customer experiences and engagement cannot be met by the application alone, because as applications get smarter, they become more brittle. New demands need to be met by the underlying databases. These databases need to be able to store vast amounts of constantly changing customer information in structured, semi-structured, and (increasingly) unstructured formats.

Transactional database systems (systems of record) were architected to store and retrieve highly structured data in tables, rows, and columns, to support an organization's accounting transactions, human resources reports, or sales purchase orders. Engaging or supporting hundreds of millions of users uploading, viewing, or sharing billions of pictures, words, or video in real time is simply beyond their intended scope.

Their inability to juggle huge amounts of today's unstructured and semi-structured data, as well as their high costs and reliability issues, mean that relational databases struggle to maintain satisfactory engagement. Making the problem even more urgent is the multiplication of mobile technologies, social platforms, and IoT applications. In today's era of digital disruption, the limitations of transactional databases are proving a brake on digital transformation.

It's not just the traditional "consumer" whose needs must be met. In the business world, user expectations have also changed dramatically, and B2B software vendors are now intensely focused on end-user experience.

For example, Concur is a provider of business travel and expense management software. To keep their users engaged with a notoriously tedious duty, they've innovated exceptional user experiences through their mobile and web applications. With an Engagement Database, they can offer a service that adapts to individual user preferences and offers sub-millisecond response times. And unlike other solutions which required separate implementations for different application tiers and languages, an Engagement Database enabled this with a single implementation.[6]

FICO (originally Fair, Isaac and Company) is a data analytics business that provides a credit rating service in the United States: quite simply, your FICO score equals your creditworthiness. The task is growing more and more complex however: consumers' always-on lifestyles now mean that FICO's applications have to detect fraudulent activity in real time. FICO has to offer both businesses and consumers a highly reliable, very fast, and secure application at all times, for which they now leverage an Engagement Database in conjunction with their transaction system.[7]

Amadeus may not be a household name, but it's the brains behind some of the most heavily visited travel websites on the web. The company provides end-to-end travel-related services for 110 airlines, 207 tour operators, 110,000 hotel chains, 30 rental car agencies, and 50 cruise ship lines. In addition to displaying real-time availability for seats on airplanes, cars, and ships, and rooms in hotels, Amadeus completes 300,000 queries per second at peak times and processed 535 million bookings in 2016,[8] using an Engagement Database that stores more than 100 terabytes of data.

Analytical technology (like the Hadoop platform[9] or Apache Spark[10]) is used when you want to run backward-looking analytics on your massive dataset of customer interactions, in order to optimize them in the future. But this can only be done after the fact, not in real time – the speed of business today. They were never intended for real-time or predictive operational database use cases. So if you're trying to personalize product suggestions to each user of your e-commerce website in real time, based on their browsing or social media interactions, an analytical database simply can't do the job. In short, it won't solve the engagement problem.
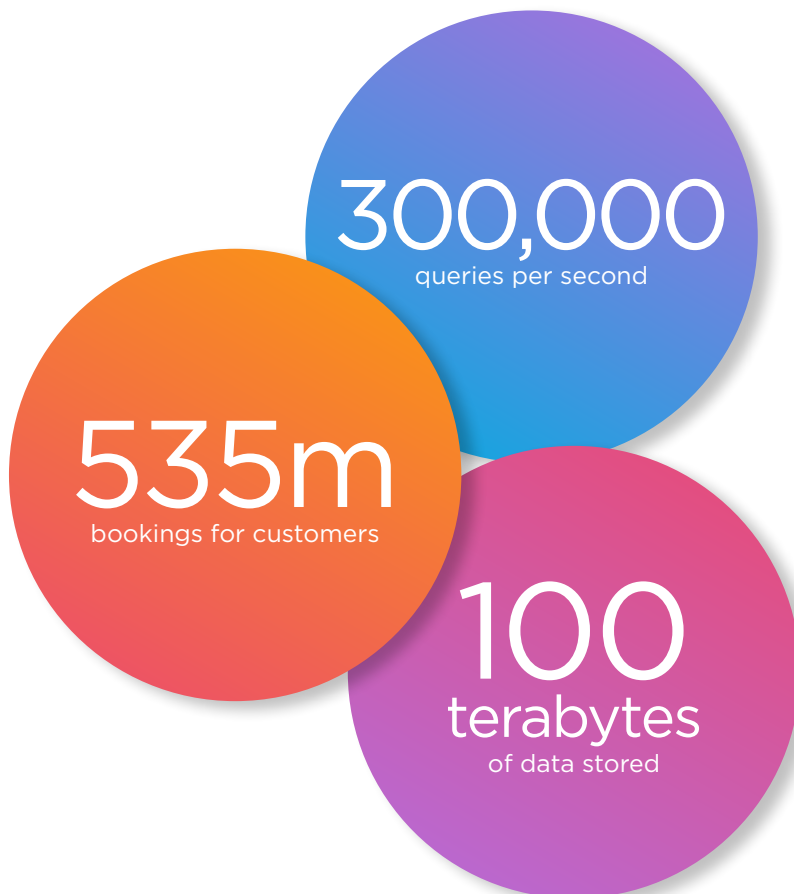
300,000
queries per second

535m
bookings for customers

100
terabytes
of data stored

Only
47%
of CEOs are being challenged by their board of directors to make progress in digital business

Engage… or perish

As we've seen, technology disruption, along with changes in consumer behavior, has led to customer experience being a key driver of digital transformation. By 2020, say IDC,[11] **40% of chief digital officers will report to the chief experience officer or chief revenue officer**, as duties for the head of sales shift to include all digital interactions. Already by 2018, 70% of organizations are expected to make operational changes based on business model disruption (Gartner).[12]

Brands now need to deliver superior customer engagement throughout the lifecycle of the customer relationship. Should they fail to do so, they face the very real possibility of being disrupted by the next Spotify, Airbnb, or Uber – a "born-digital" disruptor with no legacy technology or processes – with the capacity, will, and expertise to provide the superior customer interaction that they themselves are unable to. However, according to Gartner,[13] **only 47% of CEOs are being challenged** by their board of directors to make progress

in digital business, and a mere 56% said that their digital improvements have already boosted profits.

It's worrying that the percentages are so low. There's no lack of competitors racing to be first in their industries to meet sky-high customer expectations with innovative digital experiences. According to The Storytellers, who surveyed 171 business leaders in the Forbes 500, three-quarters acknowledge that if they do not focus on customers, their business will not survive beyond the next two years.[14]

A price offer can still net a single sale. But today's retailers know that it takes multiple interactions to build an emotional connection with a customer – and gain their loyalty. As a result, communicating with the consumer is becoming a highly personal journey.

In order to develop an all-important emotional connection, organizations are increasingly concentrating their innovation efforts under four key pillars:

- The agility to adapt to changes in trends, user preferences, or seasonality

- More responsive and context-aware customer experiences

- Seamless experiences across platforms, channels, and devices (from a website on a laptop to an app on a phone, for instance)

- Ease of support for an exponentially growing number of users, data, and operations

Enterprises have realized that convenience, utility, deep personalization, and relevancy lead to extraordinary customer experiences and enduring engagement. However, these modern requirements cannot be met just by software at the application tier. Building a great-looking, well-designed app that can be used by a consumer on any digital channel, is just the start. The underlying database is what ultimately matters – one that is architected to be agile, responsive,

scalable, and cloud native to support hundreds of millions of concurrent users. After all, the modern user spends far more time engaging and interacting and far less time transacting.

The need to deliver extraordinary customer experiences is driving the evaluation and adoption of a different kind of database. Transactional and analytical database technology will continue to support use cases they are good at, but the investment and focus is increasingly on engagement.

No matter what your starting point, revolutionizing your brand's customer experience requires a reassessment of your technology infrastructure. Beyond developing new mobile apps or expanding your sales channels, you will likely need to move beyond a legacy transaction database like Oracle and analytics databases like Hadoop. You will need a data platform that is better equipped to deliver the agility, responsiveness, availability, and scalability required for new forms of engagement and customer interaction through web, mobile, and the Internet of Things.

Such a data platform can best be defined as an Engagement Database.

Personalized

Feature-rich

Responsive

Anywhere

Anytime

What *is* an "Engagement Database"?

An "Engagement Database" powers multiple interactions and experiences by liberating the full potential of data at any scale, across any channel or device, in order to drive a more meaningful relationship.

An Engagement Database has six defining characteristics – it's built for change, it's always on (at speed), it's secure, it's cloud-native, it's seamlessly mobile, and it has built-in smarts.

1. Built for change – at scale

The Engagement Database supports millions of ever-richer customer interactions, while responding to ever-changing business requirements. It boasts a flexible schema (system of data organization) to support evolving customer interactions and simple, elastic scalability to respond to rapidly changing business requirements.

Scalability – the technical explanation

Should your app gain rapid adoption among hundreds of millions of global customers, your database must scale up to keep pace with exponential demand across geographies, devices, and platforms. With a transaction database, this quickly becomes unwieldy from both a cost and manageability perspective. However, by its nature, an Engagement Database scales out rapidly and efficiently to millions of users with push-button simplicity – and without downtime, compromised performance, or an emergency app rewrite.

And if you do wish to rewrite your app? Unlike relational databases, which have a static schema, Engagement Databases do not define how data must be modeled – the data model is defined and managed by the application. For example, with an Engagement Database, developers can change application code, and the updated schema is immediately stored and immediately accessible. As a result, developers have much greater flexibility in how they build applications and much greater agility to respond to changing needs across platforms and devices.

2. Always on, always fast

As we've seen, users today expect an engaging, responsive experience as they interact with both traditional static information and dynamic, personalized content. With its built-in fault tolerance, the Engagement Database delivers consistent high performance to get data where you need it, when you need it.

While transaction databases often struggle with round-the-clock operations, and need periodic offline maintenance, the Engagement Database keeps data and apps running around the clock, 99.999% of the time, supporting streams of data flowing in from millions of sensors all over the world.

Speed – getting technical

The Engagement Database uses a memory-centric, asynchronous architecture to deliver the best possible performance under any situation. And it maintains that level of performance for hundreds of millions of concurrent users – impossible with a transaction database at a similar cost.

3. Secure, secure, secure

In 2017, 58% of enterprises have a hybrid-cloud application strategy, and use both private and public cloud technology, according to RightScale Inc.'s sixth annual State of the Cloud survey.[15] As enterprises increasingly adopt Infrastructure-as-a-Service, an added layer of security is required. We also expect that over 20 billion devices will be connected to the internet by 2020 – a web of wired and wireless devices that need to be secured against sophisticated cyberattacks by criminals, activists, and hostile governments. Although there have been many advances in cyberdefense, infiltration techniques continue to evolve, making them difficult to detect and prevent.

Today, it is not enough to have a firewall on your company's network perimeter. The database that contains your crown data jewels needs to have its own layers of protection. With the Engagement Database, you get secure data everywhere – over the wire, on the device, in the cloud, and in the data center.

4. Hello cloud, hello world

Global organizations can now have the seamless data distribution, flexible data locality, and built-in recovery they need by deploying a cloud-native Engagement Database as part of their cloud applications. This ensures that you can agilely respond to marketplace changes and evolving customer expectations without massive engineering effort or cost – whether you deploy on-premise, in the cloud, or with a hybrid approach.

5. Seamlessly mobile

Despite their ambition, a reality of mobile devices is a lack of permanent connectivity – a factor which continues to interrupt the customer experience at the cost of sales and customers. Accordingly, the Engagement Database is built with offline data access in mind.

By accessing a local, mobile-embedded database that can automatically synchronize any changes with your cloud database, the Engagement Database will deliver the same experience both online and offline. As the embedded database forms a part of the same, single engagement data platform, you can easily support mobile apps without the added administrative overhead and cost of managing multiple databases.

6. Built-in smarts

To enhance the customer experience and deliver more relevant information, products, and services, you need to tailor and personalize applications based on behavior. Your database cannot simply be a repository for static information – it must be an avenue for insight.

The Engagement Database achieves this in various ways. By supporting full-text search and real-time analytics, it maximizes the value of your growing volumes of structured, unstructured, and semi-structured data. By integrating with big data platforms and technologies, it lets you perform offline and real-time analysis of operational data.

These capabilities make it easier to create and support intelligent applications geared to facilitate engagement and deliver a hyper-personalized experience globally, anywhere, on any device, in milliseconds.

The world's first Engagement Database, from Couchbase

With the first Engagement Database, Couchbase[16] provides the unmatched agility, scalability, and manageability that today's businesses require to continually reinvent their customer experiences and benefit from an ever-adaptable competitive edge. The final link in the digital transformation chain is finally here.

The recommended path forward

How do you start to evaluate or adopt the Engagement Database as a complement to your transaction and analytical databases? We recommend that you consider the following:

First, try to answer these questions posed earlier to assess your disruption opportunity (and vulnerability):

• Where are your opportunities – and what are the threats?

• How soon is disruption coming (or how soon could you self-disrupt)?

• How big an effect could disruption have on your business model and bottom line?

• And therefore, how much should you invest in your self-disruption strategy?

Obviously, you can't expect exact answers. But you should end up with a useful starting point from which you can flesh out your strategy, starting by:

1. Making an organization-wide commitment to drive digital transformation

2. Placing a maniacal focus on customer engagement. Why and where will changes need to be made to revolutionize your customer's experience?

3. Building new applications for superior customer engagement throughout the customer relationship lifecycle

Committing to digital transformation and investing toward this goal is critical. But these steps are ultimately in service of creating amazing customer engagement. Business has always been done one transaction at a time. But we live in an era where ever-better interactions are required before transactions can occur. And it's ongoing engagement that's the driver of lasting, profitable customer relationships.

First steps

- Read more about the technical advantages of the Engagement Database compared with traditional transactional or analytical databases

- Learn how to start transforming your organization for a new era of engagement: contact Couchbase's professional services team

- Explore the potential of an Engagement Database: download Couchbase Server and Couchbase Mobile now

Conclusion

Digital transformation is being driven by evolving customer expectations for extraordinary experiences with the brands with which they choose to interact. To capitalize on the tremendous opportunities provided by this era of engagement, you need to do more than build new web applications or mobile apps. You need to modernize your technology environment with an adaptive, responsive, scalable, intelligent, highly available, and easy to manage database: the Engagement Database.

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