

Unleash the power of data in Fintech world with MongoDB Atlas

Avant Leung

Regional Director MongoDB



Agenda



Challenges for Digital Transformation in FSI



 (\mathbf{i})

Payment with MongoDB



Data as a Service with MongoDB

Our Clients

Ø

40,000+	4000+	140+
clients,	employees,	Countries
\$890M+	~1500 in	and fast
in 2022	engineering	growing



MongoDB named a leader in The Forrester Wave™: Big Data NoSQL 2021

MongoDB and FSI Leading, modern, mission critical

Developer Data Platform for modern applications and solution landscapes

MongoDB is the general purpose, document-based, distributed data platform built for mission critical applications and the design of the multi-cloud era

No data platform makes you more productive





Today, a company's competitive advantage is tied to how well they build applications using data Competitive advantage cannot be bought Need to enable sustainable innovation JIRA is not Agility - and renaming teams neither

70% of enterprises fail in their digital transformation initiatives

Why?

And even more importantly...

Working with data has always been the hardest part of building & evolving applications How we use data to build applications has changed, but the typical data infrastructure is built on a 40 year old foundation

Because the typical data infrastructure is still built around legacy relational databases

Relational databases are optimized to solve a different set of problems

Data structures clash with modern data and the objects developers work with

Rigidity makes experimenting and iterating on applications difficult





Evolution of Data

1980 Fixed Field Message

	Ressage Reference : J092795000	
144858155108	: INSTANI 17P6 MITO3 Single Customer Credit Transfer	
SCUDDATE	1 IMPUT TIME - ISITVIOF +DIDG CENTS	
STAINCES ++ SERGEN	1 MIDLONIA	
KLVS**SEKOLR*S BANK	I HIDE DANK FLC	
ELEP-SERVER-S BANK ADDRE	55 F & CARGON SNOARE, CONTON E14 SHA, UNLIED EINGON	
ACCOUNT AND A COURT AND		
PERSONAL PROPERTY AND TONE	× 400515	
PERSONAL CONTRACT CONT	* #(b) 6822	
RCWD++ Insta	nt type and transmission	
ACUD-+BOTIFICATION ETHABL ERCURITY CONFEMATION COD RCVD++ NETWORK DELLIVERY S RCVD++ DEARCH RETWORK RCVD++ MESSAGE IAPUT BETE RCVD++ MESSAGE IAPUT BETE	RISCORT AF ADELTAKI KINT F 1001888555 ATUE S NTADOR 120058-8810022722 4000144 REMEL 19705800035884603 Sage Trailer	
\$78185X5++698/ 1/8/C 12	2 \$03945-H1RC/NARC.T#\$4312	
REWS+-SWITT MESSAGE TYPE	: CACK) 103 BCK SETWORK	
REVD-+FORMAT HESSAGE	I MT 103 INSTANT CREDIT	
REVD-+RECEIVER'S DANK	2 BARCLAPS BANK FLC	
REVO-+RECEIVER'S DANC AND	RISS : BANCLAYS HOUSE, 1 WINDBORNE ROAD, FOOLE DORSE1, UK	
ECAS++BECELAES,R VCCONAL	WARE - SEET GLOBAL PUBLICHING LIMITED	
ECVS++RECEIVER*S ACCOUNT	WJMBER: 32812722	
BIAS++BECEIAES,2 INVE WOW	8EN 68198ARC20549852812722	
READ++RKCEIARR,R PORI 100	E 5 203498	
SCAD++BUCBIANS WAILL ED	DE I BARCOREE	
SCAD-OSCEDACS.2 DANG ON	ICER 1 NR. NURRY	
REVO-SENDI OUTPUT REFEREN	CEI HERCIUK 4005157 AZ 9.3435118 BIRLISPERATORESARIADE	
SESSION 2012 SENIERCEI MA	IX 2012 PATREN	
ALVE PATES IN LUZZELE	and shall be sugged and and and and and and and and and an	
ACAIN ANCON MADONILL # 170	Restage Trailer	
RCVD+ACK: BWDFT AUTHENTIC	ATEON CONNECT THREE	
	-A	

Static, 20 year change cycle and zero innovation. Each Character position is defined

1990 Relational Message



Change possible but each bank has own schema and concept; Reasons for design lost in time and **complexity strangulates all**

2018 ISO 20022 JSON



2022 Monetization



Readable, Flexible and dynamic adjustable for ever changing requirements; new capabilities can be added without any impact to others Value Add services enabling real time analytics and immediate engagement with the consumer/client/ customer for their delight

MongoDB Atlas Developer Data Platform

MongoDB Atlas address a range of application use cases and removing complexity

Data model that maps to how developers think/code; flexible while allowing data governance when needed

Strongly consistent, support for ACID transactions

Able to support full-text search functionality for delivering a great user experience

Able to support data on mobile devices at the edge w/o having to manually sync data

Able to deliver real-time analytics on live data w/o having to move data back & forth



"Using MongoDB Atlas has allowed the team to focus on building the application and less time trying to model the perfect database schema. Upgrades are achieved by rolling the master and upgrading each node one by one whilst the application and drivers take care of the connection resulting in no outages."

> —Chris Clark, Macquarie, New Payments Platform



MacQuarie key principles

- Public cloud first
- Act like a tech company
- Real-time
- Monitor everything

https://medium.com/macquarie-engineering-blog/realtimepayments-new-payment-platform-855a193e2d2c

MongoDB in DeFi



Product catalogs

Asset management

User management

Bidding platform

Trading platform

Check out our latest whitepaper, latest client story and our web for more details.

Modernization



M-A-C-H

Four Architectural Pillars for Digital Transformation









${\bf M} icroservices$

Increased business agility & speed to market, reduced complexity.

API-first

Simplified Development, increased data interoperability, reduced inefficiencies.

$\pmb{\mathsf{C}} \mathsf{loud-native}$

On-demand, dramatically improved scalability & reliability, global reach.

Headless

Omni-channel journeys, increased flexibility, new business models and user experiences.

Ø

Reality today

Not multi-platform, not multi-cloud, not secure





Why Single View is Hard



Diverse Data Types

Reconciling the schemas of data from different systems is hard and in many cases impossible. Relational databases weren't built for this.









You need the ability to iterate on your schema. Evolving relational databases at this pace is not easy.



Feature Trade-offs

A Single View application is only as good as its ability to serve up finegrained access to the data within it.

The required agility cannot be provided by relationa products.



Typically, organizations have hundreds, even thousands of tables built up over years

pagment_idSMALL
 statume_id SMALL
 stat_id TINMINT(0)
 metol_idINT(01)

pageori_date DATETR last_update TMEST AM

anies by a tory

measure BT(11)

Infal_mater/P/TC1

payment_ic
 casterner_i
 staft_id Till
 antal_id IV
 antal_id IV
 antal_id IV
 antal_id IV
 antal_id IV
 antal_id IV
 antal_id IV

manager staff id TNYIP

whites in SAMULATIC





Tabular (Relational) Data Model

Related data split across multiple records and tables

Contrasting data models

Document Data Model

Related data contained in a single, rich document

"_id" : ObjectId("5ad88534e3632e1a35a58d00"), "name" : { "first" : "Avant", "last" : "Leung" }, "title" : "Regional Director", "address" : [{ "location" : "work", "address" : { "street" : "1 Sunning Road", "region" : "Hong Kong" }, "geo" : { "type" : "Point", "coord" : [22.2779442, 114.1830506]}}, {...} "dob" : ISODate("1970-01-01T05:00:00Z"), "retirement_fund" : NumberDecimal("1292815.75")

Flexible: adapt to change

Add new fields dynamically at runtime

```
" id" : ObjectId("5ad88534e3632e1a35a58d00"),
  "name" : {
   "first" : "Cathlon",
   "last" : "Lau" },
  "title" : "Advisory Solutions Architect",
 "address" : [
   { "location" : "work",
      "address" : {
        "street" : "1 Sunning Road",
        "region" : "Hong Kong" },
      "geo" : { "type" : "Point", "coord" : [
        22.2779442, 114.1830506]}},
    {...}
  "dob" : ISODate("1970-01-01T05:00:00Z"),
  "retirement fund" : NumberDecimal("1292815.75")
}
```

```
" id" : ObjectId("5ad88534e3632e1a35a58d00"),
"name" : {
  "first" : "Avant",
  "last" : "Leung" },
"title" : "Regional Director",
"address" : [
  { "location" : "work",
    "address" : {
      "street" : "1 Sunning Road",
      "region" : "Hong Kong" },
    "geo" : { "type" : "Point", "coord" : [
       22.2779442, 114.1830506]}},
  {...}
」,
"phone" : [
  { "location" : "work",
    "number" : "39606567"},
  {...}-
」,
"dob" : ISODate("1970-01-01T05:00:00Z"),
"retirement fund" : NumberDecimal("1292815.75")
```

Putting it all together



Putting it all together



id: ObjectId("5ad7615b9359692374cf6fba") customer id: "C000029906" date of birth: "1933-05-27" email: "dustuck1876@yandex.com" first name: "Seraphine" job: "Buchhalter / Buchhalterin" last change home customer: "2018-04-13 17:44:56" last name: "Frauendorf" marital_status: "MARRIED" policy_id: "P000090969" quote_day: 2005-05-13T22:00:00.000+00:00 cover start: 2005-05-31T22:00:00.000+00:00 last_annual_premium_gross: "129.85" policy status: "Live" last_change: "2018-04-13 17:27:52" claim_date: 2018-05-31T22:00:00.000+00:00 settled_date: 2018-05-31T22:00:00.000+00:00 claim type: "BUIDLING" claim amount: "1250" settled amount: "1100" claim_reason: "FLOOD" last change: "2018-06-01 13:54:01" last_change_home_policy: "2018-06-01 13:54:01" last change car customer: "2018-12-21 09:35:51" policy id: "PC 000000157" cover start: 2008-04-17T22:00:00.000+00:00 last ann premium gross: "637.51" car model: "Toyota Prius" max_coverd: "1000000" last_change_car_policy: "2018-04-13 17:24:10"

ODS/ODL

Flexible documents, high volume ingest, enrichment



Data as a Service



Flexibility

MongoDB avoids rigid data models and is optimized for large read-write operations. It is therefore possible to support 3D modelling processes in a database and, due to MongoDB schema flexibility, also track other associated data such as semantic relationships and even individual revisions.

Connectivity

MongoDB provides capabilities connecting transparent to external applications. REALM integrates the mobile world. The SPARK Connector enables for highly parallel a Ssas clik o ongoDB.

Optimized Applications

MicroStrategy

MongoDB idiomatic drivers embed the database into your application.

- No need for Object Relational Mapper
- No need for additional frameworks to structure your database



Risk & Treasury

٩

Single View Real-time views of all your most important data



Real-time Analytics and Reporting Analytics at the speed of your data



Legacy offloading/replacing Move workloads off the legacy systems

Broduct catalogs, asset management and more

Trade Repository Store, edit and present all types of content



Integrated Risk Platform

Morgan Stanley

Trading and Risk Management

JPMorgan Chase & Co. Trade Settlement Platform Securities Lending

MIZHO Regulatory Reporting

Single Platform for Data

Market Data Analytics

🗱 UBS

Counterparty Credit Risk, PTS

Single View



Global insurance leader generates coveted single view of customers named the "The Wall" on MongoDB in 90 days



Introducing technology like MongoDB to our development teams created a buzz and excitement that motivated and empowered teams to deliver work in months that would typically take years."

> -Gary Hoberman CIO & SVP, App Dev @ MetLife



Coinbase, with over 20M users, \$220B+ assets traded and \$20B assets stored in over 33 countries, partners with MongoDB to scale reliably in the cloud to meet the explosion of cryptocurrency demand

10x

platform resilience improvement

80x

API RPM capacity improvement in ~6 months

12x

improvement in speed of scale

70%+

faster app development release time

Coinbase's mission is to create an open financial system for the world. MongoDB's technology is enabling us to scale globally and we're looking forward to partnering with the company along our journey to become the most compliant, reliable and trusted crypto-trading platform in the world.

> –Niall O'Higgins, Engineering Manager, Cøinbase





Selected clients



Thank You