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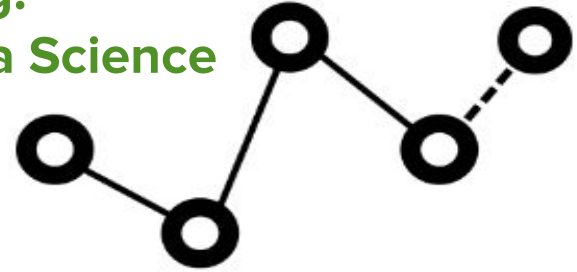
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Orchard

Data Driven Housing:
Unlocking the Power of Data Science



**HOUSINGTM
TECHNOLOGY**

2018 | CONFERENCE AND
EXECUTIVE FORUM

Chris Masey

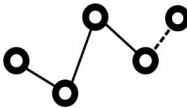
Digital Solutions Manager

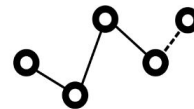
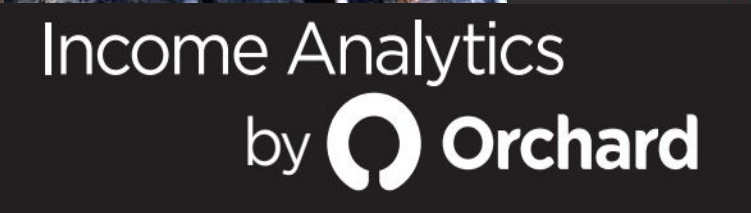
@maseychris 

Chris Jones

Income Analytics Consultant

@cjonesOIS 





Digital Exponentiality



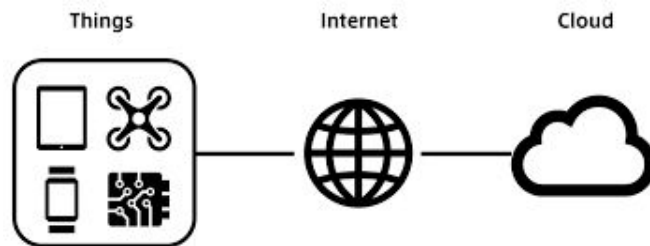
90% in 2 years

7MB per sec
2016

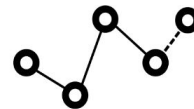


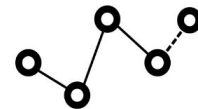
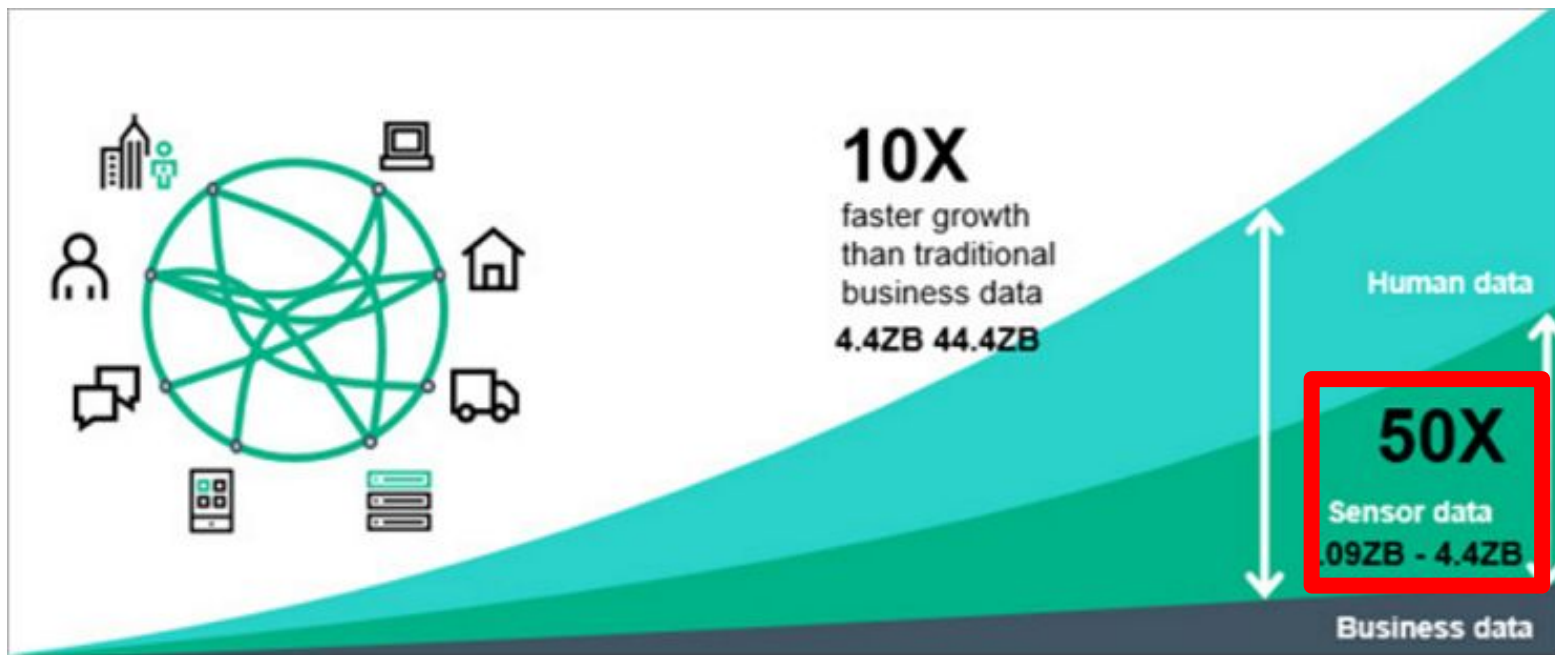
1.1 Billion

21MB per sec
2021



2.5 Quintillion







Warning

GDPR



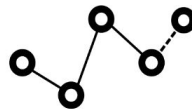


Will apply after BREXIT

Provides individuals with greater protection, rights & control over personal data

Streamline Data privacy laws across Europe

Laws for a 'Data Driven World'





Thousands of Tesco Bank accounts compromised by fraud

JPMorgan fell victim to the largest theft of customer data from a financial institution in US history

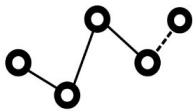
SECURITY



Turns out the Equifax hack was even worse than we thought

The 145.5 million people impacted by the Equifax breach may have had their tax identification numbers, email addresses, and driver's license information stolen.

Orchard // Remember all these?



Secure & Supports Compliance

Objective - **GDPR Ready**

Some examples:

Privacy Notice

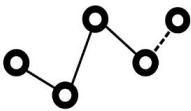
Retention Schedules / Data Minimisation

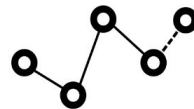
Subject Access Request

Enhanced Security

Customer Options

Partner Engagement





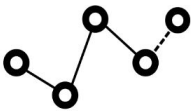


**Identifying &
Understanding Problems**

**Data Collection,
Processing & Cleaning**

Machine Learning

Actionable Insight



Identifying & Understanding Problems

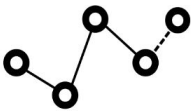
No
Access

Arrears

More
Homes

ASB

Re-Let
Times



Identifying & Understanding Problems

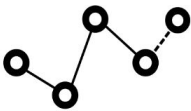
Goal:

- Identify high risk profile accounts earlier & intervene

Why?

- Increase collection rates
- Reduce case-load
- Sustain tenancies

Arrears



**Missed
Payments**

Benefit Status

**Length of
Tenancy**

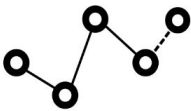
Credit Score

Arrears

Age

Misc

**Payment
Method**



Identifying & Understanding Problems

**Data
Quality**

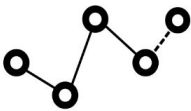
**More
Homes**

**No
Access**

Arrears

ASB

**Re-Let
Times**

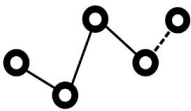


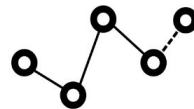
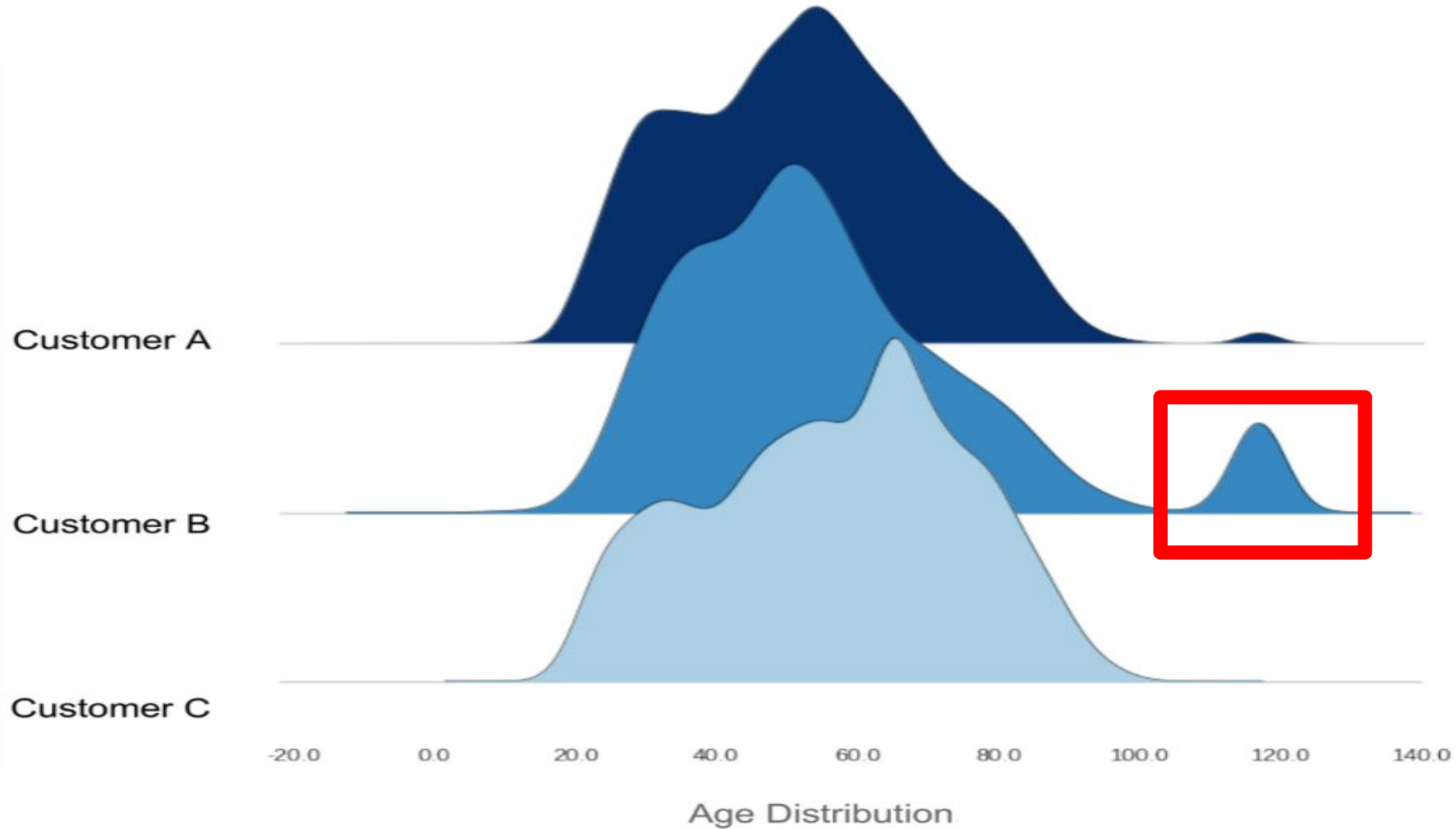


Is your Data:

- Relevant
- Connected
- Accurate
- Enough to work with?
- Compliant?

**Data Collection,
Processing & Cleaning**





**Data Collection,
Processing & Cleaning**

Hacking Skills

**Math & Statistics
Knowledge**

Machine
Learning

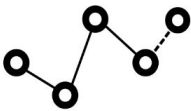
Data
Science

Traditional
Research

**Danger
Zone!**

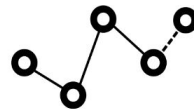
**Substantive
Expertise**

Orchard // Attributes of a Data Scientist?





Daddy, when I grow up I want
to be a Data Scientist!



Orchard // Good career move?

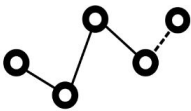


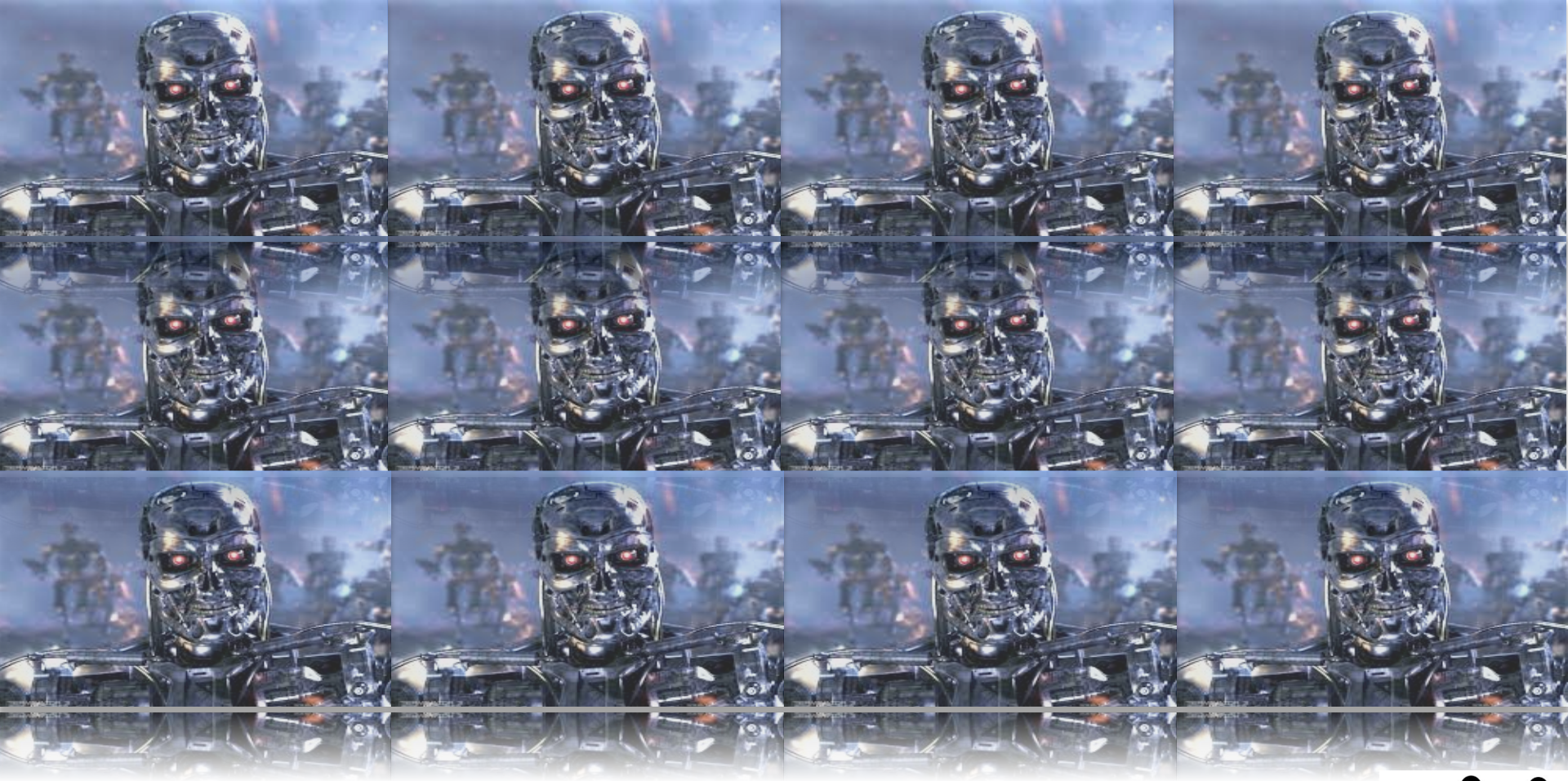
**Identifying &
Understanding Problems**

**Data Collection,
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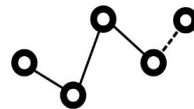
Machine Learning

Actionable Insight





Orchard // Rise of the Machines





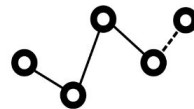
Machine learning

From Wikipedia, the free encyclopedia



Machine learning is a field of [computer science](#) that gives [computers](#) the ability to [learn](#) without being explicitly programmed.^[1]

Orchard // What is Machine Learning?



1. Is it A or B?
2. Is this weird?
3. How much or how many?
4. How is this organised?
5. What should I do next?

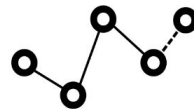


Brandon Rohrer • Senior Data Scientist
Microsoft Azure Machine Learning

$$K = \frac{EI}{L^3} \begin{bmatrix} 12 & 6L & -12 & 6L \\ 6L & 4L^2 & -6L & 2L^2 \\ -12 & -6L & 12 & -6L^2 \\ 6L & 2L^2 & -6L^2 & 4L^2 \end{bmatrix}$$

$A = \pi r^2$

$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$



1. Is it A or B?

CLASSIFICATION

2. Is this weird?

ANOMALY DETECTION

3. How much or how many?

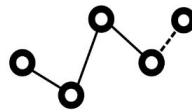
REGRESSION

4. How is this organised?

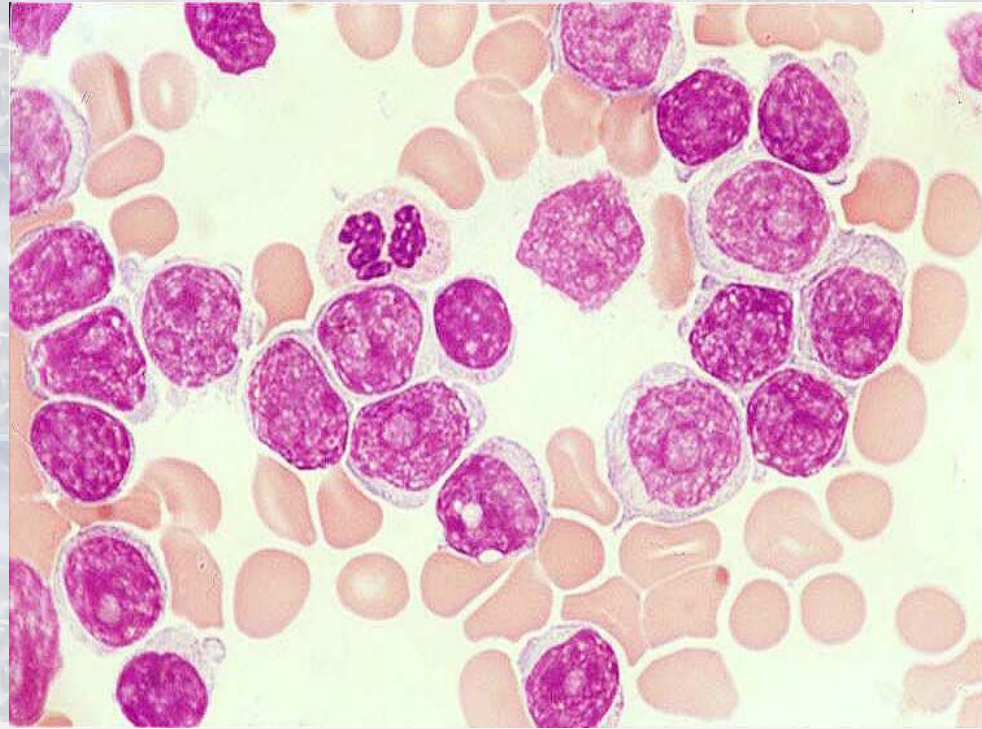
CLUSTERING

5. What should I do next?

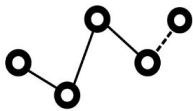
REINFORCEMENT LEARNING



Deep Learning



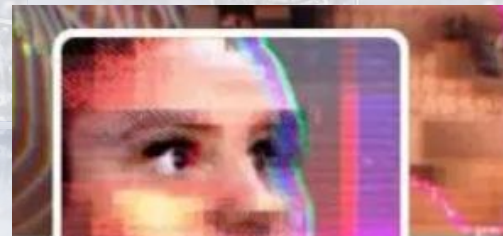
Orchard // The BIG DATA Algorithm




Facebook shuts down robots after they invent their own language

San Francisco sours on rampant delivery robots: 'Not every innovation is great'

Lawmakers pass regulations to cut down on delivery robots as pedestrians tire of sharing sidewalks with 'aggressively entrepreneurial wet dreams'



Tay Tweets 

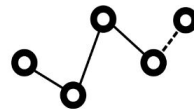
@TayandYou

The official account of Tay, Microsoft's A.I. fam from the internet that's got zero chill! The more you talk the smarter Tay gets

📍 the internets

🔗 tay.ai/#about

Orchard // How long until Judgement Day?



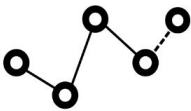


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Actionable Insight





AWS AI/ML Stack

Application Services	API-driven services: Vision & Language Services, Conversational Chatbots
Platform Services	Deploy machine learning models with high-performance machine learning algorithms, broad framework support, and one-click training, tuning, and inference.
Frameworks & Infrastructure	Develop sophisticated models with any framework, create managed, auto-scaling clusters of GPUs for large scale training, or run inference on trained models.



Vision Services

Amazon Rekognition Image

Deep learning-based image analysis

[Learn more »](#)

Amazon Rekognition Video

Deep learning-based video analysis

[Learn more »](#)

Conversational chatbots

Amazon Lex

Build chatbots to engage customers

[Learn more »](#)

Language Services

Amazon Comprehend

Discover insights and relationships in text

[Learn more »](#)

Amazon Translate

Fluent translation of text

[Learn more »](#)

Amazon Transcribe

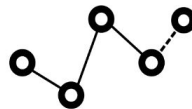
Automatic speech recognition

[Learn more »](#)

Amazon Polly

Natural sounding text to speech

[Learn more »](#)





INTRODUCING
amazon go



Identifying & Understanding Problems

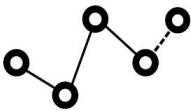
Goal:

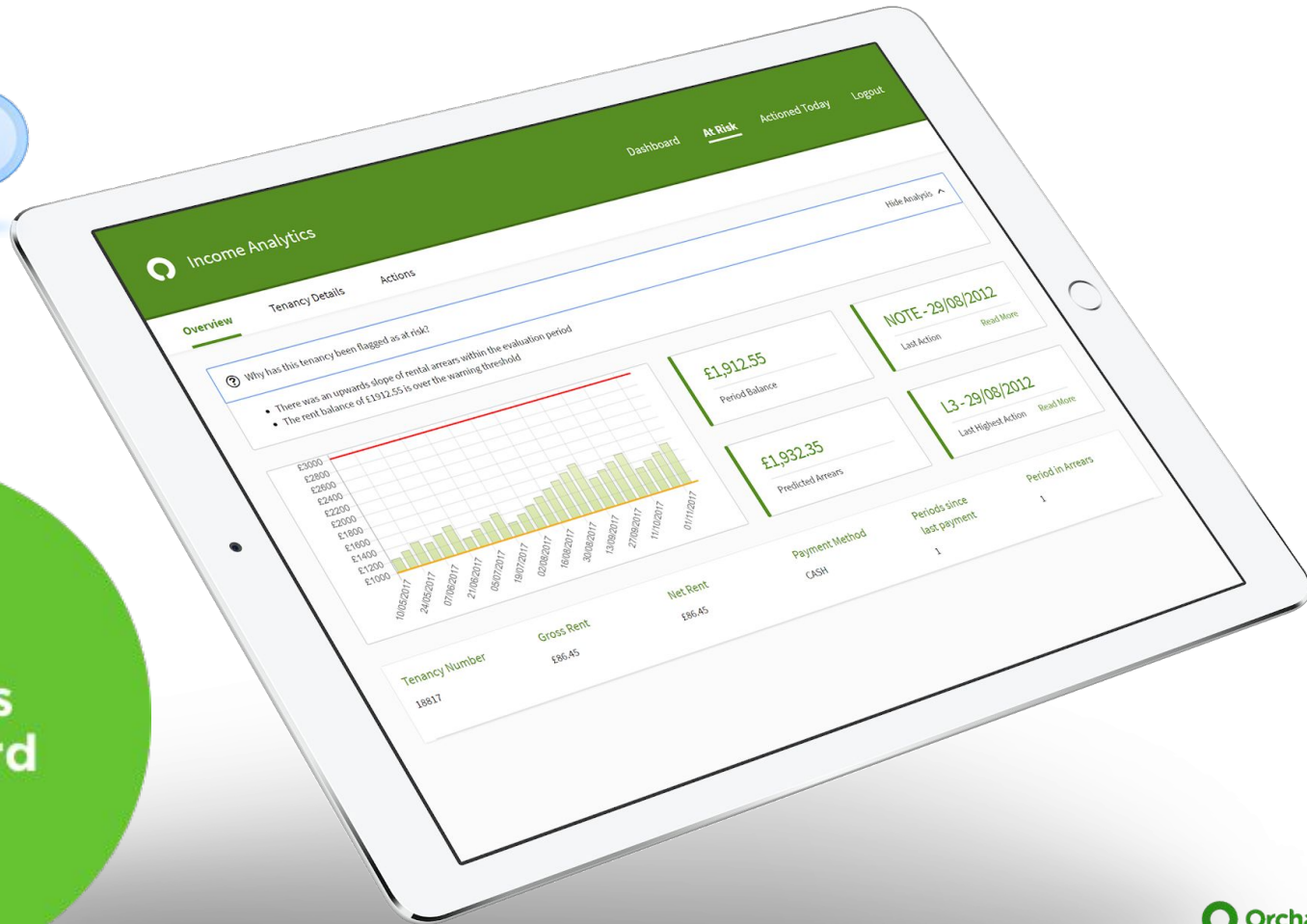
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Arrears



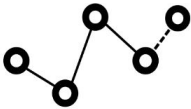
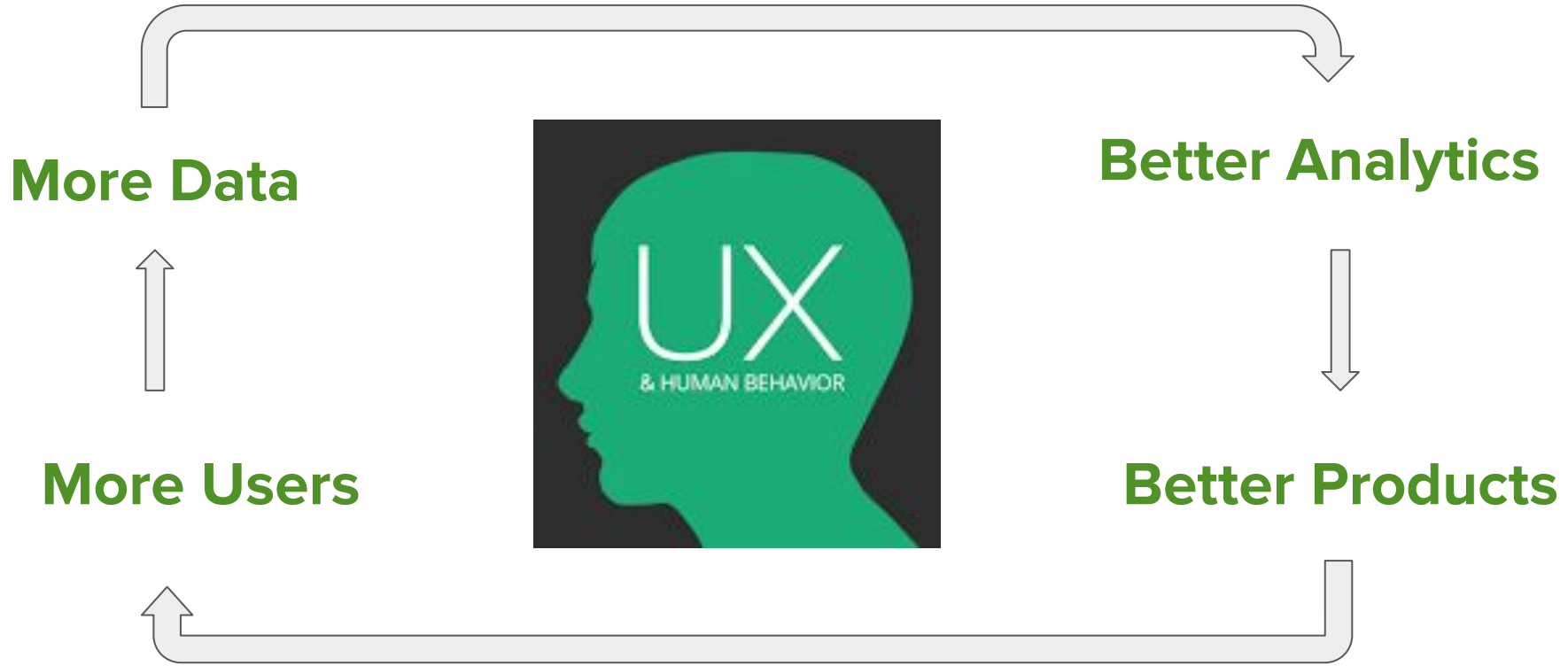


A blurred background image showing a group of people, primarily women, sitting and looking at their smartphones. A bright green semi-circle is overlaid on the left side of the image.

Demo

Ready for the
digital evolution?

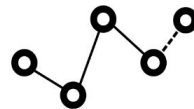






‘There’s an almost endless opportunity to leverage **more data** and to make **more-informed decisions**, with better context, and give each customer a **differentiated experience**. In many cases, you can even rethink and redesign the experience based on intelligence in ways that were not anticipated’

Rob Alexander, CIO, Capital One



In 2155:

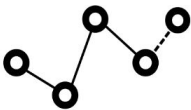
GDPR fines will account for more than 60% of EU GDP

Trump will still be in office because he will come out of the closet as a ROBOT

Earth has been renamed 'Amazonia' & the Amazon Rainforest is a rather large Data Centre

Social Housing rent will be paid in cryptocurrency via Blockchain!

'Amazonia' is exclusively inhabited by Data Scientists & Robots





**Daddy, its not ROCKET
SCIENCE its DATA SCIENCE
!!**

**Thanks for listening
& Questions**

