



Consumer Genetic Testing

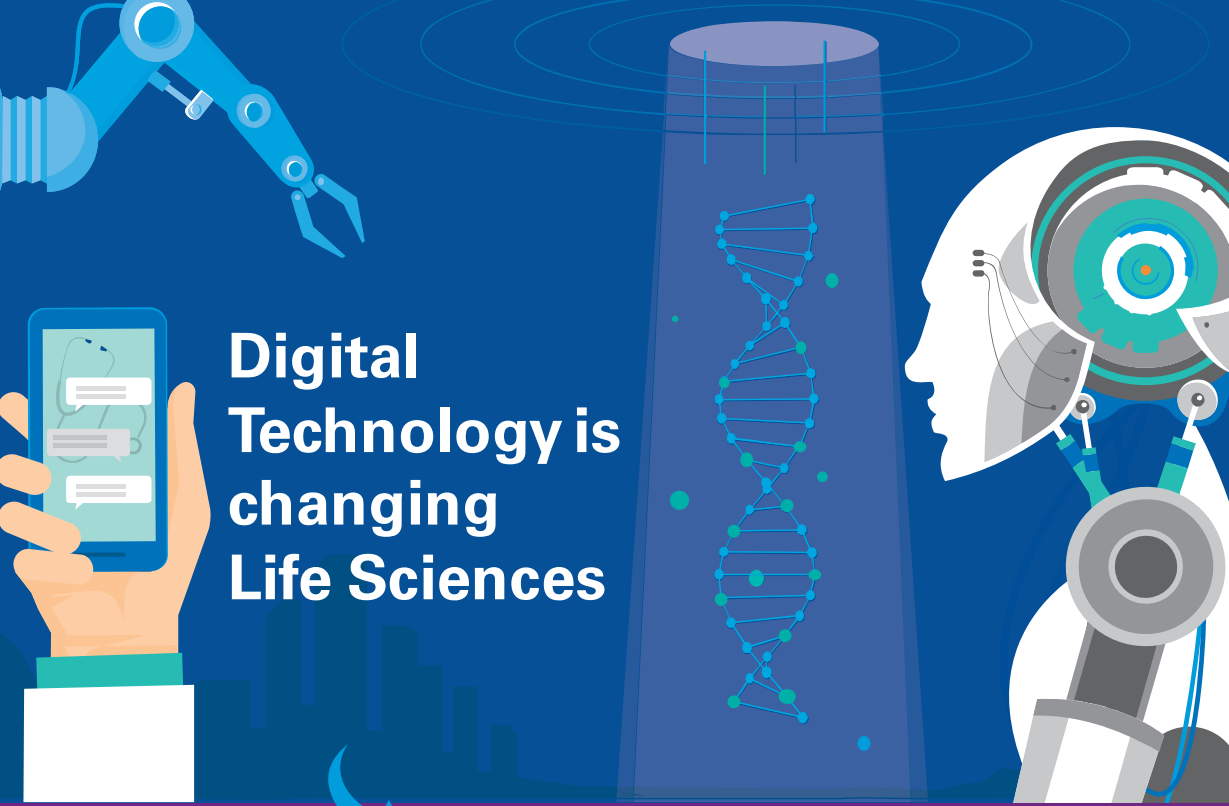
CybSec and Blockchain Health 2020

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Agenda





Digital Technology is changing Life Sciences

Yet the **risks technology** present are equally daunting in a **highly regulated, highly scrutinized market.**



Customers have **increasingly high expectations**

Market competition and **regulation is squeezing profit margins**

The public **health landscaping is changing**

Regulators are **becoming increasingly demanding**

Technology oriented organizations are entering the market and **challenging traditional LS organizations**

Those who let **innovation stagnate**
risk collapse

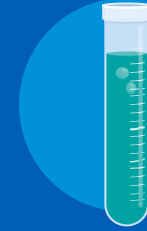
A few definitions

Traditional Genetic Testing



- Done through healthcare providers, who:
 - Determine which test is needed
 - Collect and send the DNA sample
 - Interpret the test results
 - Share the results with the patient.

Direct-to-Consumer Genetic Testing



- Marketed directly to customers via television, print advertisements, or the Internet, and the tests can be bought online or in stores.
- A DNA sample is sent directly to the organisation performing these tests.
- Consumers receive their results directly, in absence of the involvement of a healthcare provider in the process.

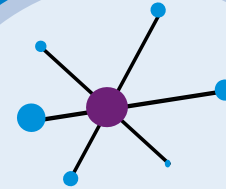
Some Challenges



Identifiability of genetic data



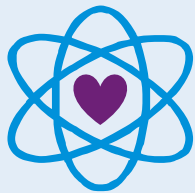
Transitivity of genetic data amongst family members



Data Sharing and Information Access inc. by third parties



Data sales and commercialisation of genomics data



Ethical use of genomics data



Data governance – a single human genome takes up 100 gigabytes of storage space



Data Subject Rights



Third Party and Supply Chain Management



Not getting Privacy & Security right means:

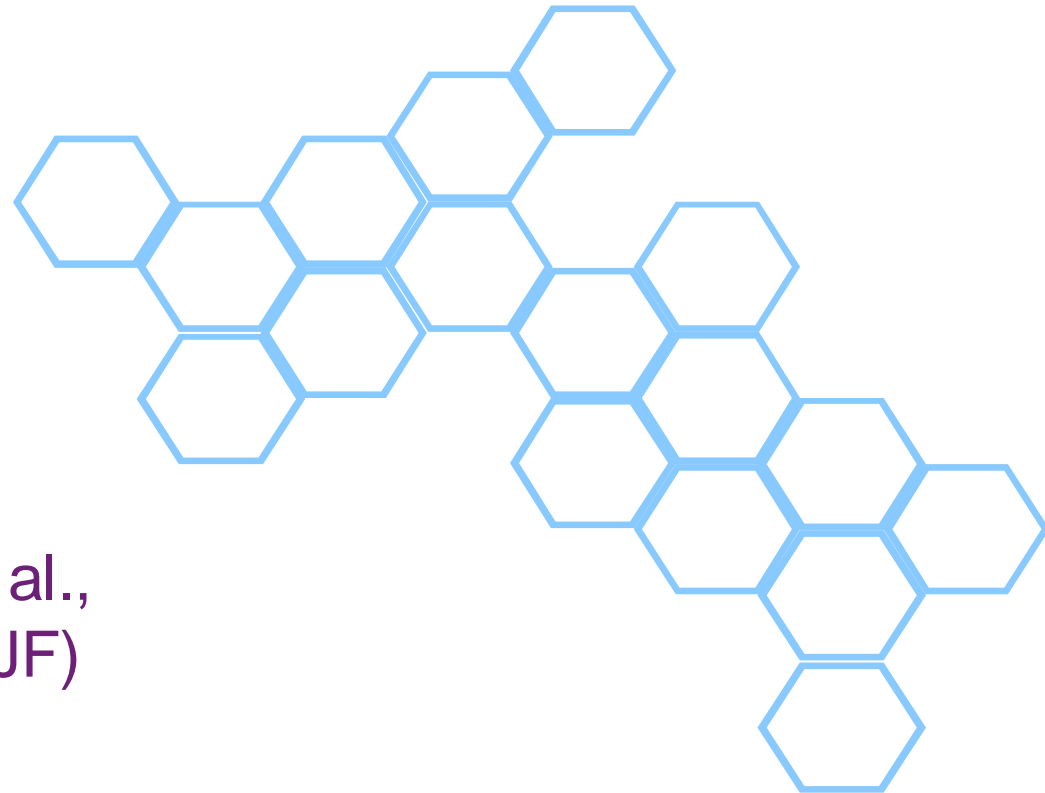
92 million



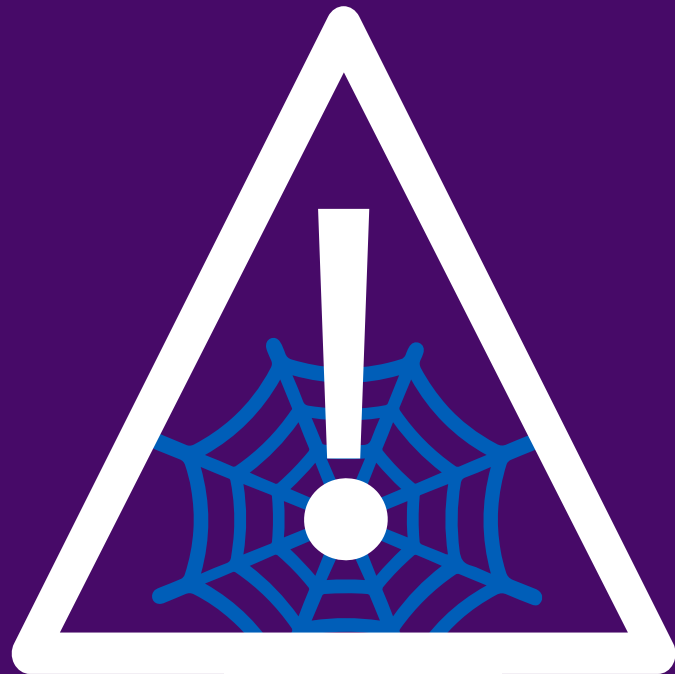
email addresses and password hashes leaked



Class action lawsuit
(Hall v. MyHeritage LTD, et al.,
Case No. 2:18-cv-00721-EJF)



Not getting Privacy & Security right means:



Medical data is worth at least

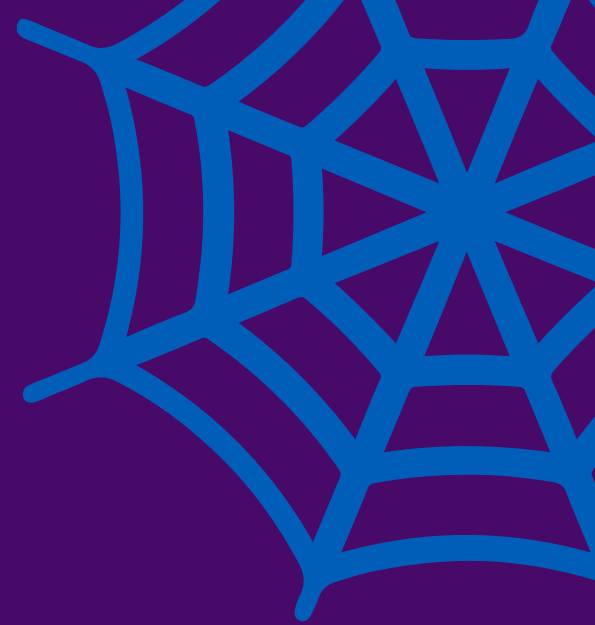
10 times

as much as **financial data**

on the **dark web**,

making companies processing genomics data a prime target for criminals looking to **exploit**

security vulnerabilities.



Source: [\[https://www.reuters.com/article/us-cybersecurity-hospitals/your-medical-record-is-worth-more-to-hackers-than-your-credit-card-idUSKCN0HJ21I20140924\]](https://www.reuters.com/article/us-cybersecurity-hospitals/your-medical-record-is-worth-more-to-hackers-than-your-credit-card-idUSKCN0HJ21I20140924).

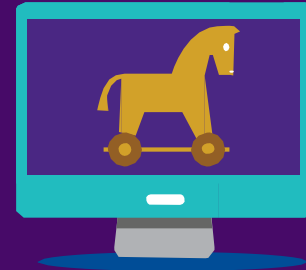
Growing threats to trust in medical devices



Ransomware



Insecure data transfer channels



Weak access controls



Lack of monitoring processes



Poor coding



Insecure disposal practices



Lack of maintenance and update processes



Minimal cross-channel communication

Mobile security is a real threat

87 percent of time spent using mobile devices is spent using apps

An average of
53,309
mobile apps are released on the Apple App Store each month



24.7 percent of mobile apps include at least one **high risk security flaw**



Forrester predicted people would download more than

226 billion

apps annually



Business apps are **three times** more likely to **leak login credentials** than the average app

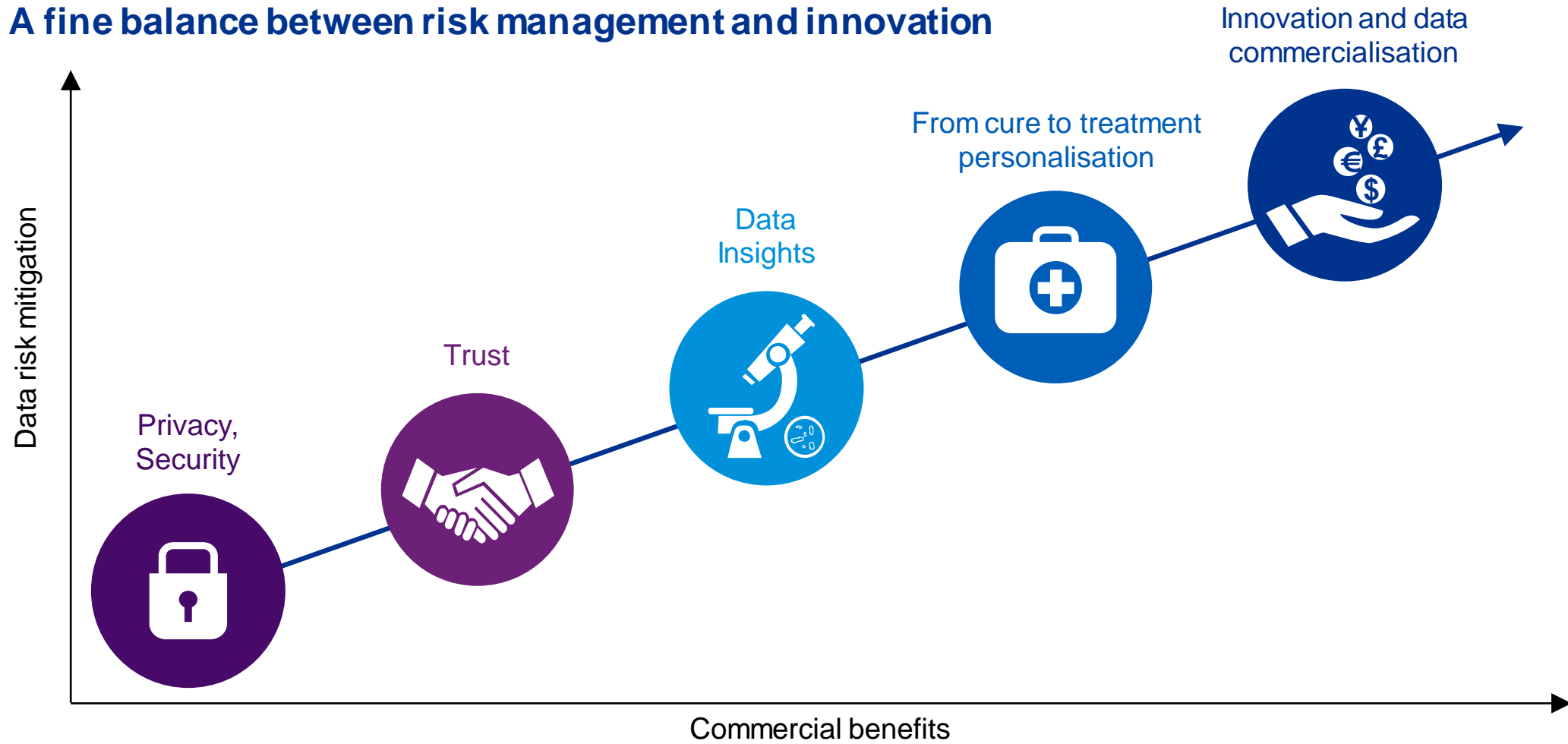


Games are **one-and-a-half times** more likely to include a high risk vulnerability than the average app



Your role

A fine balance between risk management and innovation



Mitigation of these risks

Notice &
due-diligence
on third party
data

Legal bases for
processing
and **consent**

Clarity on **data**
processing
purposes

Data privacy,
security and
Ethics boards

Privacy &
Security by
design

IT
architectures
for **genomic** (and
phenotypic) data
generation,
processing, and
protection

Blockchain

Differential
Privacy &
Identity and
Access
Management

Data
Obfuscation

Monitoring
and **Auditing**





Thank you





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