How Data Science Is Transforming Healthcare

2nd of September, 2021
Speaker

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Data Science Evangelist
DataCamp

Twitter

- Mechanical Engineering graduate from the university of Manchester
- Researched cardiovascular assist devices
- Data Science Evangelist at DataCamp
- Designbyus podcast host
DataCamp’s Mission

Our mission is to democratize data skills for everyone
Hands-on skill building

- Python
- R
- SQL
- Power BI
- Oracle
- X
- Scala
- Tableau
- Spreadsheets
- Spark
- Shell
- Git

June 30, 2020
Professional data science certification

Certify your existing workforce
Ensure your teams are trained on the latest in data science skills

Employee retention
Employees at companies with internal mobility stay 2X longer - LinkedIn

Simplify the hiring process
Network with our existing certified data scientists for your hiring needs.

Improve your data practices
Bring the best data practices into your organization.
From coding to insight, even faster with Workspace

Get started instantly
Start your analysis from one of our ready-to-use templates or link to your own data

Apply your learning
Practice your newly acquired skills in a real world environment

Run your analysis
Use your existing skills in Python or R (with support for SQL coming soon) to write and run code

Share your work
Publish your workspace and share it with colleagues. Curate your work on your DataCamp profile
Trusted by over 2,000 data-driven companies

DataCamp is transforming the way businesses prepare their employees for the future of work.
Agenda

1. Explore the opportunities of data science in healthcare
2. Discuss the current state of data transformation in the healthcare industry
3. Understand the main barriers to adoption within the data science space
4. The people component and how to scale their skills
The opportunities of data science in healthcare
The Patient Journey

- Diagnosis Phase
- Treatment Phase
- Outcomes Phase
The Patient Journey

Care Providers

Medical Insurers

Pharmaceuticals

TREATMENT PHASE

THE PATIENT JOURNEY

DIAGNOSIS PHASE

OUTCOMES PHASE
AI, Machine Learning, and Data Science
AI, Machine Learning, and Data Science

Artificial Intelligence
Programs with the ability to reason like humans

Anything ranging from a calculator to a self-driving car
Artificial Intelligence
Programs with the ability to reason like humans

Machine Learning
Algorithms with the ability to predict outcomes based on historical data

Anything ranging from a calculator to a self-driving car
Clustering data points based on similarities (customer segmentation), predicting stocks based on historical price data
AI, Machine Learning, and Data Science

Artificial Intelligence
- Programs with the ability to reason like humans

Machine Learning
- Algorithms with the ability to predict outcomes based on historical data

Deep Learning
- Subset of machine learning focused on cognitive tasks like vision, speech

- Clustering data points based on similarities (customer segmentation), predicting stocks based on historical price data

- Image recognition algorithms

- Anything ranging from a calculator to a self-driving car
Artificial Intelligence
Programs with the ability to reason like humans

Machine Learning
Algorithms with the ability to predict outcomes based on historical data

Deep Learning
Subset of machine learning focused on cognitive tasks like vision, speech

Data Science
A cross disciplinary field that seeks to extract insights from data

AI, Machine Learning, and Data Science

Anything ranging from a calculator to a self-driving car

Clustering data points based on similarities (customer segmentation), predicting stocks based on historical price data

Image recognition algorithms
Healthcare is data-rich

2,314

Exabytes of data are produced in the global healthcare industry

1 exabyte = 1 billion gigabytes
1 billion gigabytes = 212 million DVDs

Statista
Costs savings yearly in EU alone

€240B

Billion can be saved every year with the operationalization of data science and machine learning in EU alone.

Deloitte
The drug discovery promise

50%

Reduction in time to create new drugs

Average time to create new drugs ranges from 9 to 17 years

McKinsey
The cost of fraud in insurance

$80B

Is the yearly cost of medical insurance fraud a year

Subex
In short

**Pharmaceuticals**

50%

AI can help reduce cost and time of drug discovery by 50%

**Medical insurance**

$80B

Billion is the global cost of insurance fraud

**Care providers**

€240B

Billion are saved every year with the operationalization of data science
The societal benefits

400K

Lives saved yearly due in Europe alone due to operationalization of data science and machine learning in healthcare

Deloitte
The current state of data science in healthcare
In 2018, Israel started an initiative to combine national digital medical records in a unified system to maximize AI analytics.

Funding to support R&D and innovation on health in Europe that includes industrial policy and AI implementation by 2027.

Source: eihealth
Source: European Commission
The data story of the decade

Source: NSW Government
Increase between 2015 in VC capital invested in AI in healthcare startups across the world

5X to 28X

McKinsey
Research advances gain traction

DeepMind’s AlphaFold

AlphaFold has the ability to accurately predict protein structures from their amino-acid sequence.
Research advances gain traction

DSP-1181

Is the first AI-developed drug to enter clinical trials developed by UK firm Exscientia

DSP-1181

On 30th January 2020 Exscientia announced the first molecule designed by Artificial Intelligence (AI) to enter a Phase 1 Clinical trial.

The compound, DSP-1181 is being progressed by collaborator Sumitomo Dainippon Pharma as a long-acting and potent serotonin 5-HT1A receptor agonist, with its phase I clinical study to treat obsessive-compulsive disorder as an indication candidate. The project required less than 12 months to complete the exploratory research phase, just a fraction of the time typically required to discover a new candidate molecule.
The tip of the iceberg

Deep analytics enablement across the value chain

Transformative business outcomes

Operationalization of machine learning and data science use cases
Patient care

Cost reduction
- Patient triage
- Chatbots
- Real-time patient flow optimization

Improve efficiency and logistics
- Appointment management
- Robotic process automation
- AI-powered radiology assistant

Greater value to customers
- Early diagnostics and prevention
- Medical imaging and diagnostics
- Symptom checker
Medical Insurance

Cost reduction
- Fraud detection
- Chatbots
- Call center routing

Improve efficiency and logistics
- Claim automation
- Customer churn and lifetime value

Greater value to customers
- Product recommendations
- Demand prediction
- Personalized activity for disease prevention
Pharmaceuticals

Cost reduction

- Drug discovery acceleration
- Efficient go-to-market motions
- Predictive analytics for clinical trials

Improve efficiency and logistics

- Supply chain planning
- Forecasting excellence
- Business intelligence for better resource management

Greater value to customers

- Improving clinical trial processes
- Drug discovery innovation
- Better drug effects check-ins
What are the obstacles of this data transformation?
The main barriers to adoption
Actionable steps L&D can take

**TRUST AND RESPONSIBLE AI**

**DATA QUALITY & INFRASTRUCTURE**

**DATA ACCESS & REGULATIONS**

**DATA SKILLS & DEMOCRATIZATION**
Trust & Responsible AI

CHALLENGES

SOLUTIONS

Download the white paper!
Trust & Responsible AI

CHALLENGES

TRUST IN MODELS

SOLUTIONS

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TRUST IN MODELS

BLACK BOX MODELS

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EXPLAINABILITY TECHNIQUES

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CHALLENGES

- Trust in Models
- Black Box Models

SOLUTIONS

- Explainability Techniques
- AI Governance Frameworks

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Trust & Responsible AI

CHALLENGES

- TRUST IN MODELS
- BLACK BOX MODELS

SOLUTIONS

- EXPLAINABILITY TECHNIQUES
- AI GOVERNANCE FRAMEWORKS
- DATA LITERACY AND UNDERSTANDING

Download the white paper!
Data infrastructure and quality

**CHALLENGES**

**SOLUTIONS**
Data infrastructure and quality

CHALLENGES

DIGITALIZATION

SOLUTIONS
Data infrastructure and quality

CHALLENGES

DIGITALIZATION

DATA OWNERSHIP

SOLUTIONS
Data infrastructure and quality

CHALLENGES
- DIGITALIZATION
- DATA OWNERSHIP

SOLUTIONS
- ADOPTION
- LEGISLATION
Data access and regulations

CHALLENGES

SOLUTIONS
Data access and regulations

CHALLENGES

DATA PROTECTION

SLOW GROWTH

SOLUTIONS
Data access and regulations

**CHALLENGES**
- DATA PROTECTION
- SLOW GROWTH

**SOLUTIONS**
- SANDBOXES
- EVOLVING REGULATION
Data skills

CHALLENGES

SOLUTIONS
Data skills

CHALLENGES

LACK SUBJECT EXPERTISE

LACK DATA SCIENCE EXPERTISE

SOLUTIONS
Data skills

**CHALLENGES**

- Lack Subject Expertise
- Lack Data Science Expertise

**SOLUTIONS**

More in the next section
How important are data skills for you/your team?

1. Not very important, we don’t have tasks that require data skills
2. Slightly important, we have some tasks that require data skills
3. Important, data skills is increasingly central for my role/team
4. Very important, data skills are central for my role/team
The people component and how to scale their skills
1 Understand your objectives

Set upskilling objectives
Align your data upskilling objectives with a business objective — for example, equipping R&D specialists with the ability to automate workflows

Measure training success with business impact
Success of training or upskilling should be measured with business metrics, like costs $ saved, or value generated
Determine the learning personas

MEDICAL PROFESSIONALS
Determine the learning personas

- MEDICAL PROFESSIONALS
- DATA ANALYSTS
Determine the learning personas

MEDICAL PROFESSIONALS
DATA ANALYSTS
RESEARCH AND DEVELOPMENT EXPERTS
Determine the learning personas

- Medical Professionals
- Data Analysts
- Research and Development Experts
- Data Scientists
3

Personalized learning paths

MEDICAL PROFESSIONALS

SKILLS

- Data literacy
- Critical thinking and ability to ask the right questions
- Data-driven decision making
Personalized learning paths

SKILLS

MEDICAL PROFESSIONALS

- Data literacy
- Critical thinking and ability to ask the right questions
- Data-driven decision making

DATA ANALYSTS

- Data Analysis
- Programming knowledge in SQL, R, or Python or Business Intelligence tools like Tableau or PowerBI
- Subject Matter Expertise
- Data Visualization skills
3. Personalized learning paths

**SKILLS**

**MEDICAL PROFESSIONALS**
- Data literacy
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**DATA ANALYSTS**
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**RESEARCH AND DEVELOPMENT EXPERTS**
- Programming skills
- Handling large datasets
- Machine learning and automation
- Cloud computing
- Medical Data Analysis
3rd party ad

**Personalized learning paths**

**SKILLS**

**MEDICAL PROFESSIONALS**
- Data literacy
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**DATA ANALYSTS**
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**RESEARCH AND DEVELOPMENT EXPERTS**
- Programming skills
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**DATA SCIENTISTS**
- Subject Matter Expertise
- Deep Learning
- Handling complex datasets
- Cloud Computing
- Statistical analysis
3

Personalized learning paths at Allianz

- **Program Launch**
  - April 1st, 2021

- **1000 Learners**
  - 1000 Allianzers around the world using DataCamp

- **Custom Tracks**
  - 3 custom tracks designed for Allianz

- **Custom Capstone**
  - Customized capstone projects using real world Allianz data

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Watch the webinar [here](#)
Assess skills regularly

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- [Image of assessment matrix for Python, R, and SQL skills]
5

Create a learning culture

Make learning fun, collaborative, and engaging
Create a learning culture

- **COLLABORATIVE LEARNING**
  - Make learning fun, collaborative, and engaging

- **EXPERIMENT WITH LEARNING MODALITIES**
  - Try out different learning modalities, from self-led learning, blended learning, and live instructor led trainings
Create a learning culture

- **Collaborative Learning**: Make learning fun, collaborative, and engaging.
- **Experiment with Learning Modalities**: Try out different learning modalities, from self-led learning, blended learning, and live instructor led trainings.
- **Personalized Learning Paths**: Create personalized learning paths for different roles and personas.
Create a learning culture

**Collaborative Learning**
- Make learning fun, collaborative, and engaging

**Experiment with Learning Modalities**
- Try out different learning modalities, from self-led learning, blended learning, and live instructor led trainings

**Personalized Learning Paths**
- Create personalized learning paths for different roles and personas

**Psychological Safety**
- Celebrate learning as part of career growth – promote psychological safety across the organization
Self-led learning at Airbnb

Data University Curriculum Overview

100-Level: Data Awareness
- Data-Informed Decision Making, Intro to Stats & Data Resources

200-Level: Data Collection & Visualization
- Core Data, SQL, Superset, Tableau, ERF, Knowledge Repo

300-Level: Data at Scale
- Hive, Airflow, R, Python, Machine Learning, Data Logging

Data University Vision

To empower EVERY employee at Airbnb... to make data-informed decisions... by providing data education... that scales by role & team.
Blended Learning: Data Analysis with Python at Bloomberg

One hour **introduction class** explaining how Python is used at Bloomberg

12–20 hours of learning via **DataCamp** per quarter

Three live 1½ hour classroom sessions led by **technical experts** with persistent chat for help

Final project using **Bloomberg data**

Watch the webinar [here](#)
Let’s summarize
The current state

Care providers, pharmaceuticals, and medical insurers are losing vast amounts of time, money, and resources in areas that can be improved by AI and talent transformation.
Barriers of adoption

1. Consumer trust, responsible AI, and education
2. Data infrastructure and quality
3. Data access and regulations
4. Data skills and democratization
Actionable steps

1. Understand your objectives
2. Determine the learning personas
3. Personalize learning tracks
4. Assess skills regularly
5. Create a learning culture
What questions can I answer for you?

Additional Resources

- Connect with Luigi on LinkedIn
- WHITE PAPER: Your Organization's Guide to Data Maturity
- Register for one of our upcoming webinars
- Learn more about DataCamp for Business
- WHITE PAPER: The L&D Guide to Data Fluency
- ON-DEMAND: Train your Workforce to Thrive in a Data-Driven Age
How DataCamp builds and sustains talent transformation

ASSESS
Test your skills and track progress

LEARN
Complete interactive courses

APPLY
Solve real-world problems

PRACTICE
Practice with quick daily challenges
Companies using DataCamp achieve course completion rates 6X higher than traditional online course providers.
Ready for a personalized demonstration? Visit datacamp.com/business/demo to learn more!
Thank you

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