



Quantum  
The Story Behind the Numbers



Matching digital records to resolve customer identity:  
**the Quantum Matchbox**

## Identifying customers from millions of records is a common problem

A global company routinely accumulates a huge amount of data, but maybe not enough information. Inquiries, bookings, sales, service, customer care, feedback, social media interactions, newsletter subscriptions, loyalty programmes, invoicing and payments – customers use a range of different channels, resulting in a deluge of unrelated digital records and a collection of databases. In fact, so many that the customers' identities are often elusive. Which is of course a problem when you want to offer the best possible service to them.



## You care about your customers, not database records

The transition from having millions of unrelated digital records to knowing the people behind them allows you to understand your customer base: who has bought which products, where the best customers are, the level of service they experience, how behaviours evolve and individual preferences change. Having a full picture of your customers means being able to offer them better and more relevant services. It helps in detecting fraudulent behaviour and in designing products. In short – it's key in business.

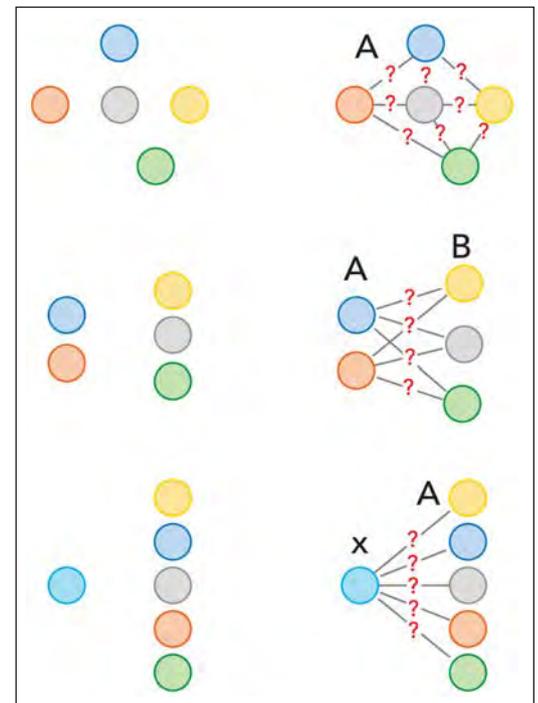
How can you understand which of the millions of existing disconnected profiles, collected over the years, belong to the same person?

## When the math seems to work against you: big numbers and so many different formats

In order to identify all the records belonging to a single customer, all the existing records must be compared to each other.

- But there may be **hundreds** or **thousands of records** for one single customer: people can buy products providing minimal personal details, or through intermediaries. They may have a loyalty programme. They may have multiple profiles and subscriptions. And of course, over the years people move, use different email addresses and payment methods, adopt new behaviours, change phone numbers, get new loyalty cards. Mathematically, for one million records, there are *500 billion possible combinations* to compare. Just 100k records mean 5 billion different combinations.
- Also, one must deal with **many different ways** of presenting information: names can be spelled differently, dates, phone numbers and addresses come in dozens of formats, information may be abbreviated, inconsistent, mistyped, invalid, or missing ... not to mention the usage of multiple languages or other alphabets such as Cyrillic or Chinese.

In short, there are **too many comparisons** to perform with standard methods, and they are riddled with **uncertainty**.

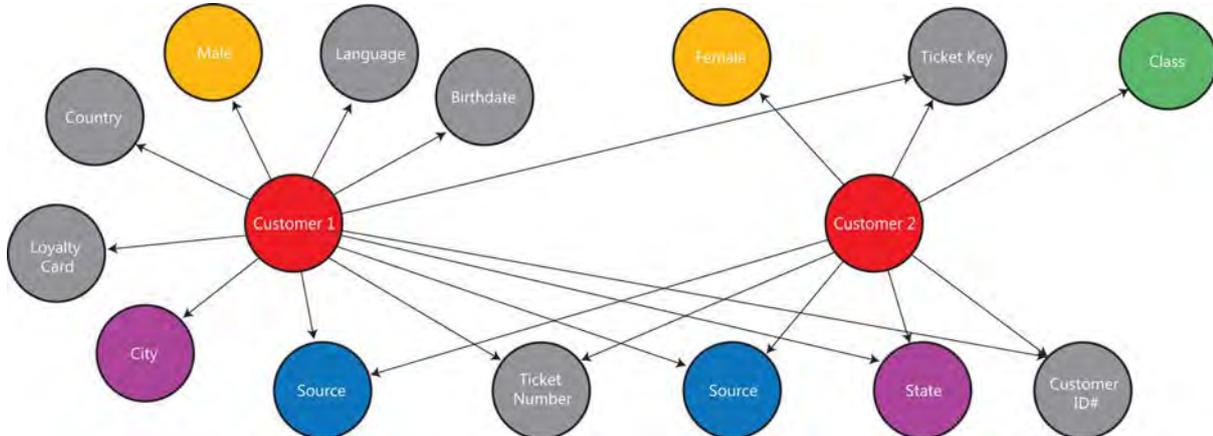


Record-matching scenarios speed the comparisons and preserve data quality when matching large numbers of records

## Quantum's Matchbox: clever algorithms, serious performance

The solution Quantum designed and implemented to solve this problem is called the Matchbox. What sets it apart from other offers currently on the market is easy to tell.

- ✓ The Matchbox is **fast**: Quantum's data scientists greatly reduced computational volume while preserving quality, by creating record-matching criteria based on carefully designed tests. This smart filtering, coupled with high parallelisation, guarantees the computing performance required by the task.
- ✓ The Matchbox is **flexible**. A set of re-usable applications cleans and enriches the input data – giving the Matchbox great robustness in dealing with records of varying quality, language and geographical origin. Standardisation of email and world-wide postal addresses, phone numbers, names; transliteration of non-Latin alphabets; assignment of gender; conversion of unstructured data into structured records: these are some examples of mechanisms that allow the Matchbox to digest nearly any input.
- ✓ The Matchbox is **multi-purpose**: depending on your business purpose, you can match records at the level of single persons, or households, or products, or corporate clients, and more.
- ✓ The Matchbox is **customisable** to deal with disparate systems and formats. We understand that different companies have different strengths and use different technologies. This is why Quantum took great care in creating a solution that is compatible with a wide range of IT environments, databases, operating systems.
- ✓ The Matchbox offers **flexible deployment**. It can be deployed in the cloud or on premise, and run in-house or as a service. Your specialists can run it, or you can opt to receive the output and enjoy its benefits without committing your people or your servers to it.



## About Quantum

Quantum is a data science and analytics company, located at Technopark in Zurich. We help clients to identify their most valuable customers, products, or services; determine potential risks; discover hidden potential in their markets; pinpoint and eliminate bottlenecks and inefficiencies; and provide other insights to steer their business. We do this by combining business experience and knowledge with the application, implementation and teaching of scientific methods of data analysis, data management, reporting and modern visualisation to turn data into information.

## Discover what data science can do for you

To learn more about how modern data science can help you and your business, visit our website at [www.quantumanalytics.ch](http://www.quantumanalytics.ch) or contact us at [info@qbis.ch](mailto:info@qbis.ch).