

# Life after Ph.D. Industry

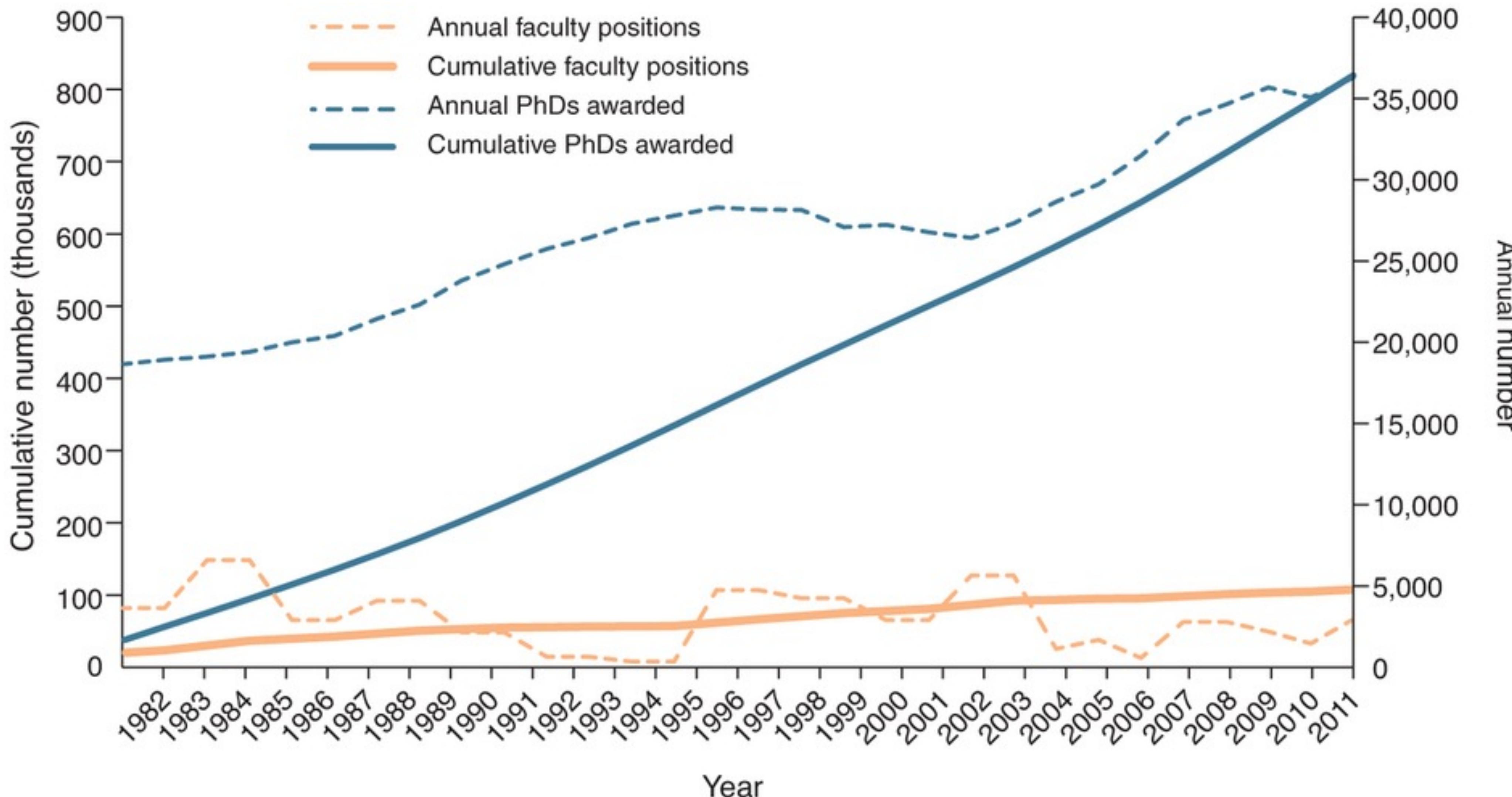
**Jason Reich, IBM York Lab**

 @jasonreich —  @ibmuniifyorklab

“Sell out with me, oh yeah.  
Sell out with me tonight.

Record company's gonna give me lots of money  
And everything's gonna be alright.”

– Real Big Fish (1996) 'Sell Out'



– Schillebeeckx, Maricque & Lewis (2013)  
*'The missing piece to changing the university culture'*

What I did then...

# Life before Ph.D.

- **2005–09** Computer Systems and Software Engineering (MEng)
- **2009–14** Computer Science (Ph.D.)
  - Supervised by Colin Runciman and Richard Paige

“Combining property-based testing and mechanised proof verifies compilers with higher confidence than property-based testing alone, for less effort than mechanised proof alone.”

- PROPERTY-BASED TESTING AND PROPERTIES AS TYPES:  
*A HYBRID APPROACH TO SUPERCOMPILER VERIFICATION*

# COMPILER VERIFICATION

The image consists of four overlapping word clouds in orange and white, set against a solid purple background. The word clouds represent different aspects of Haskell verification:

- Top Left:** A large word cloud centered around "TESTING". Other prominent words include "FUNCTIONS", "PROOF", "ABSTRACT", "VERIFICATION", "COMPILER", "PROGRAM", "TYPES", "SYNTAX", and "IMPLEMENTATION".
- Top Right:** A word cloud centered around "VALUES". Other prominent words include "PROPERTIES", "CHAPTER", "LAWY", "STATE", "TEST USED", "SUPERCOMPILER", "HASKELL", "CORRECTNESS", and "MORE".
- Bottom Left:** A word cloud centered around "TEST USED". Other prominent words include "SOURCE", "SMALLCHECK", "SET", "SERIES", "STATES", "MODEL", "SERIES", "TEST USED", "SUPERCOMPILER", "HASKELL", "CORRECTNESS", and "MORE".
- Bottom Right:** A word cloud centered around "TEST USED". Other prominent words include "TEST USED", "SUPERCOMPILER", "HASKELL", "CORRECTNESS", and "MORE".

The word clouds overlap significantly, creating a dense composition of related terms.

# Why did I choose industry?

- Ran out of Ph.D. funding at 3.5 years and still had work to do
- Didn't find any academic work immediately available
- Convenient location
- Friendly people
- Interesting work

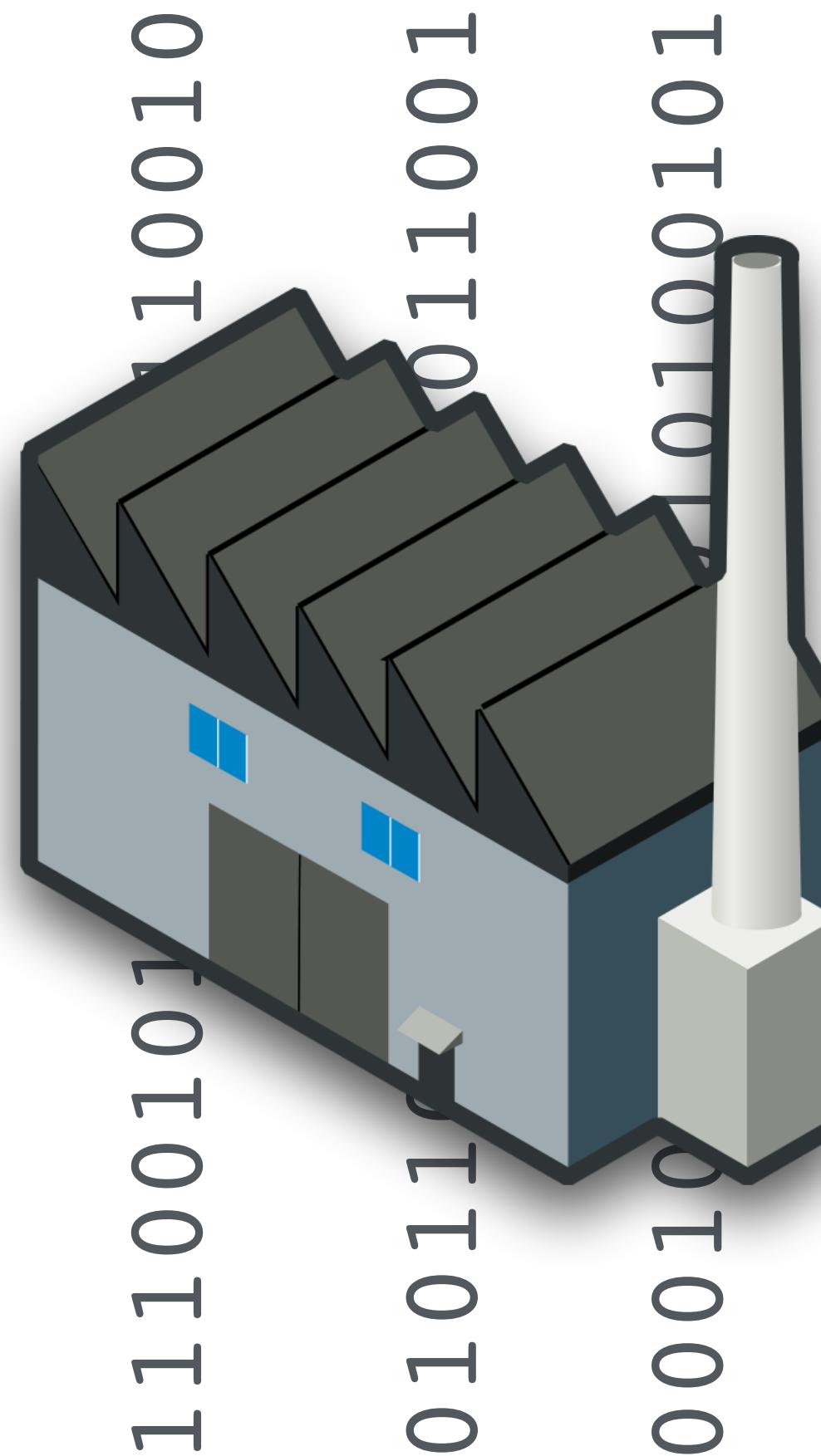
What I do now...



robbophotos on Flickr



# IBM Analytics



- What happened?
- What's going to happen?
- What should be done about it?

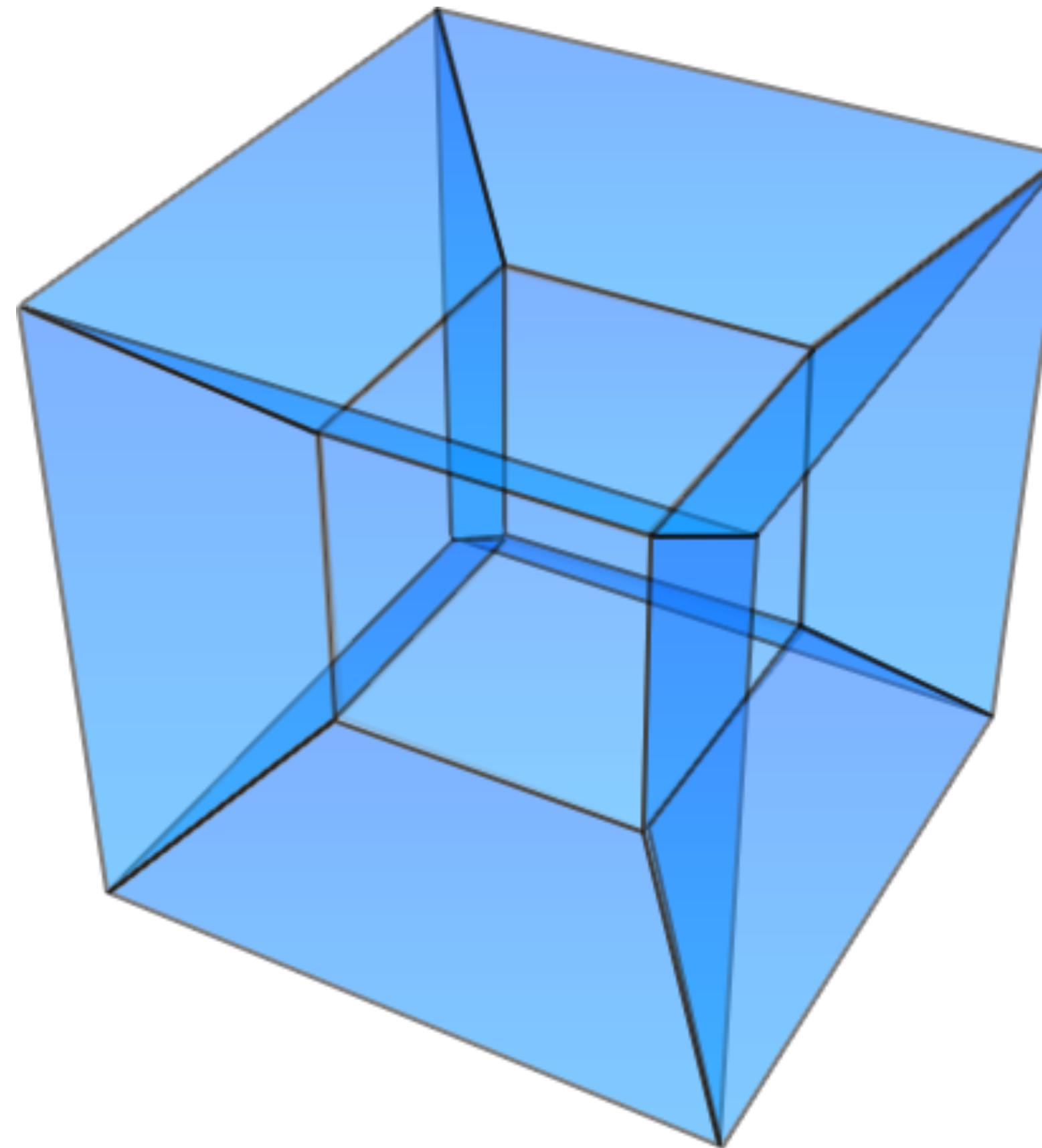
# Spreadsheets?



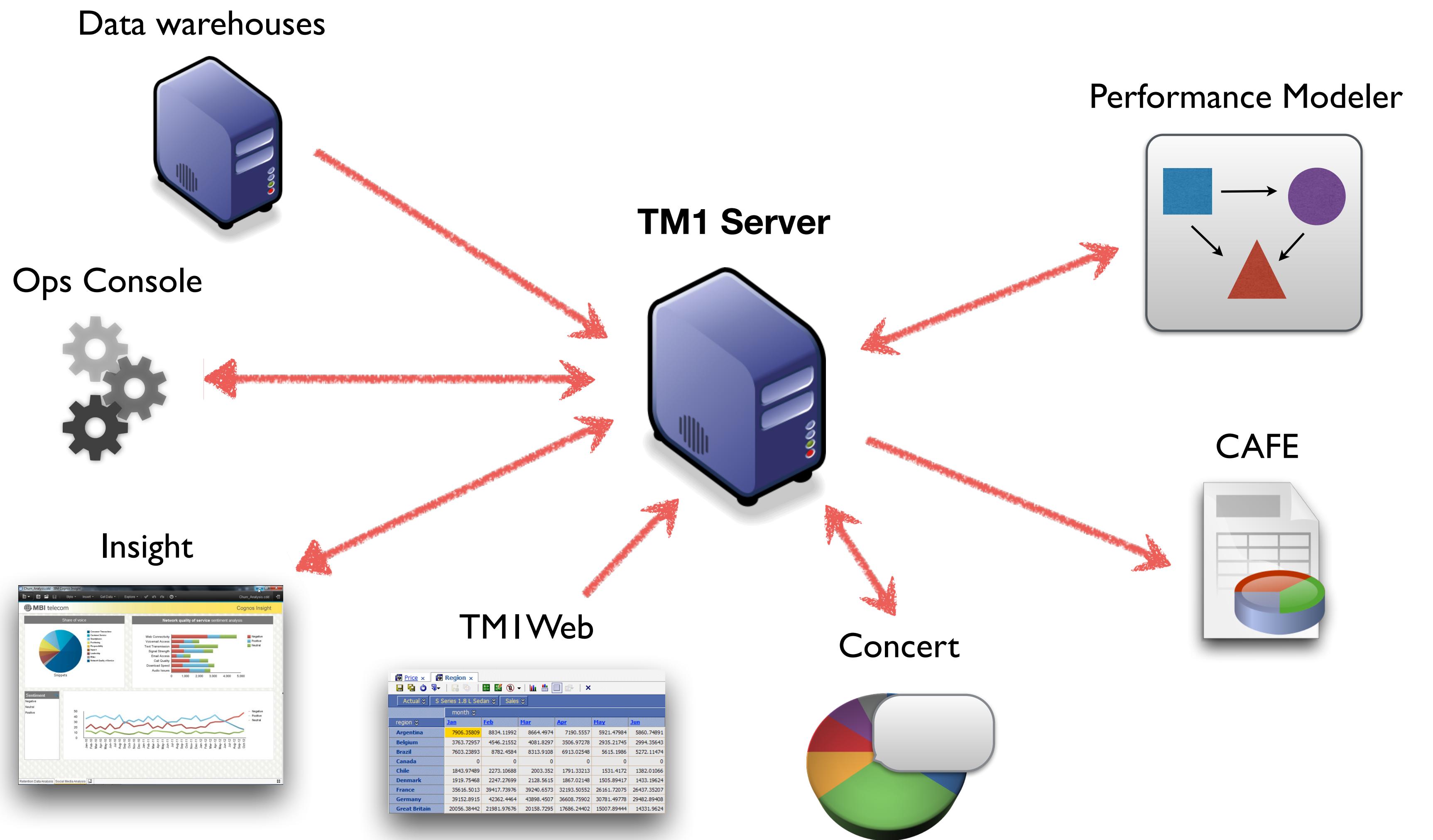
**Does not scale with organisation.**

# OnLine Analytics Processing

- Hypercube data structure
- Dimensions are hierarchical
- Values stored at intersections
- Calculations defined over subcubes



# IBM Cognos TM1



And many more...

# My roles

- **Software Engineer** — I build stuff
- **Development Lead** — Help other people decide what to build and how to build it
- **Scrum Master** — Represent the development team to management
- **University Liaison** — Help promote collaboration, knowledge exchange and supervise project students

Academia ➔ Industry

# We made it!

Class of 2014



# Transferred skills

- **Deep knowledge** — Functional programming techniques, graph algorithms and modern verification techniques
- **Self-reliance** — Knowing my limits and having the confidence to push beyond them
- **Critical analysis** — Researching, reasoning and vigorously defending a point of view
- **Knowledge of university structures** — Invaluable for recruitment and coordination

# Caveats

- Industry don't always immediately recognise

# What's different?

- Team to discuss ideas with
- Less time to teach and learn
- Well-defined goals and timeframes
- More money and free time
- Less travel
- Clear and vocal stakeholders
- Strict technology and legal restrictions
- Performance management
- Rapid progression