The Alan Turing Institute

Social Data Science for Workforce Development in the IT Sector

Gian Marco Campagnolo
Science Technology & Innovation Studies
School of Social & Political Science
University of Edinburgh

Project Description

- Finding career patterns using professional networking data of 7,000 industry analysts: the entire professional population
- Combining text mining, sequence analysis and insights from 10 years of qualitative research
- Particular focus on early factors, such as inter-professional career transitions
- Methodological innovation in the social media data for predictive policing

Research Questions

(1) Can we identify **career patterns** in entrepreneurial careers with jobs taken later in a career and no institutionalised professionalisation system?

(2) Can we identify alternative **early events** effecting careers outcome in the absence of clear correlation between education and career outcome?

(3) Can we inform probabilistic models with descriptive findings from (1) and (2) and use internet-generated data for now-casting and **predictive policing** in IT workforce development?

Research Team

- **Robin Williams:** 20 years of research on IT profession & and co-author of first academic book on Industry Analysts
- **Beatrice Alex:** developed text mining application for recruiter to match online CVs of software engineers
- **Gil Viry:** expertise in social network and sequence analysis in life course events including occupational history
- **Duncan Chapple:** PhD student at Edinburgh University and IT Influencer Professional

Timeliness of research

- UK shows the largest **IT skill gap** in Europe
- Current policy attempts are **slow** and target factors loosely correlated with career outcome
- Career studies on early factors (e.g. on job training) do not seem up to speed with **most attractive jobs**
- Research using **internet-generated data** for IT influencer detection is methodologically reckless

Policy response to IT skill gap

- According to research run by IDC and Empirica, the IT skill gap in Europe amounts to 272,000 jobs and it is meant to grow to 515,000 in 2020, with UK showing the highest gap in Europe.
- The Recruitment and Employment Confederation (REC) said in May that the number of vacancies of IT specialists continues to rise, even before the potential restrictions on immigrants once the UK leaves the EU.
- For policy-makers, this should be addressed by making IT careers more **attractive**.

Education & the IT profession

- reputation is linked to occupationally rigid professions, with early career entry and **longer time spent in education** (Abbott, 1998)
- Bidwell & Briscoe (2011) **correlate education with occupational career of IT professionals**. However, their research focuses on the beginning of careers.
- When analysis extends to later stages in a career, it emerges that in terms of achieving a CEO position changing four different jobs within the same company has nearly the same impact as getting an MBA from a top-five program (Berger, 2016).

On job training & the IT profession

- workers are expected to work in large companies early in their career as these can afford the economy of scale entailed in providing on job-training (Hu, 2003). Afterwards workers can trade their expertise in client business.
- Large companies are "pool" companies where people work while awaiting raise in demand which allow them to trade their expertise independently (Abbott, 1998)
- Once having joined top companies, IT influencers might tend to stay and exploit the reach offered by their position, rather than trading their expertise independently. (Finger and Dutte, 2014)

Data collection

- database of 7k Industry Analyst profiles
- pilot sample 300 profiles
- power 100 index

100 random analysts
99 top analysts
100 analysts with ERP expertise
33 CEOs

Data preparation

company size

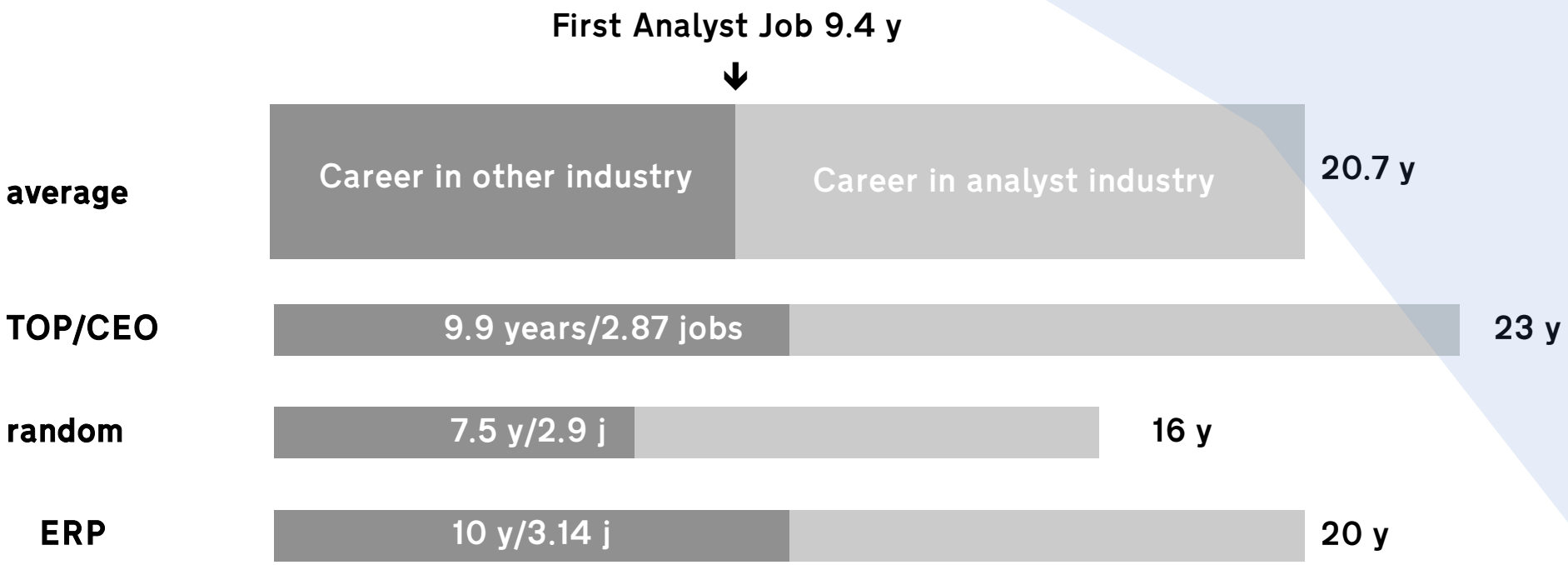
Size	How many times a company is mentioned in out dataset
Large	More than 12 times
Small	Less than 12 times

company seniority

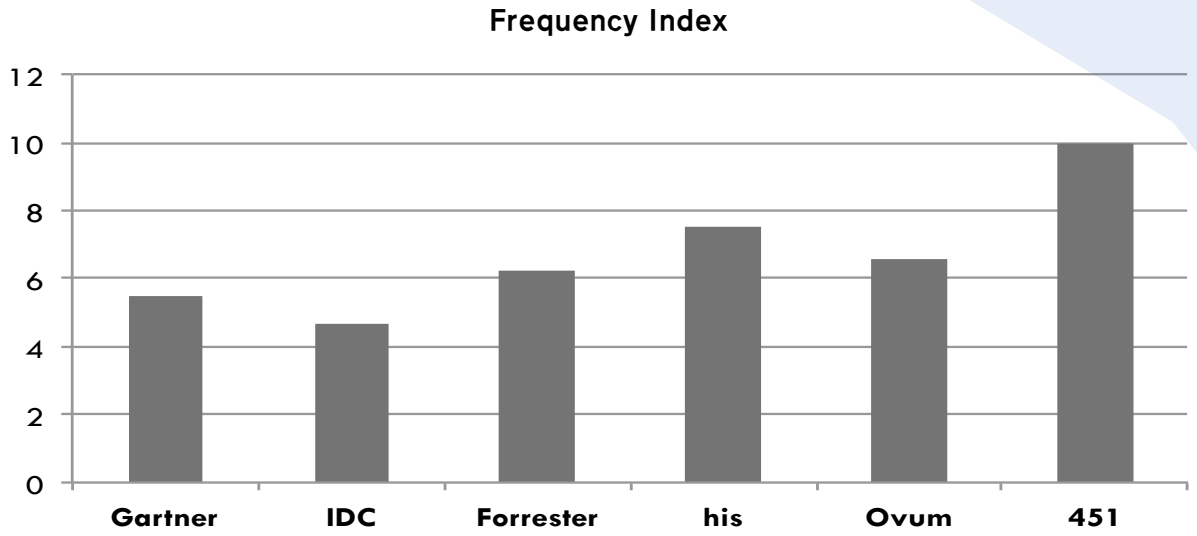
Seniority	Date the company is joined
New	Company joined durin the last 6 years of a career
Old	Company joined earlier than in the last 6 years
Oldest	Company nobody worked for in their last job

	(x) 1979				
	Job element		Company element		
	Job title	seniority	industry	size	seniority
Analyst X	ceo	NA	YY	SMALL	OLD

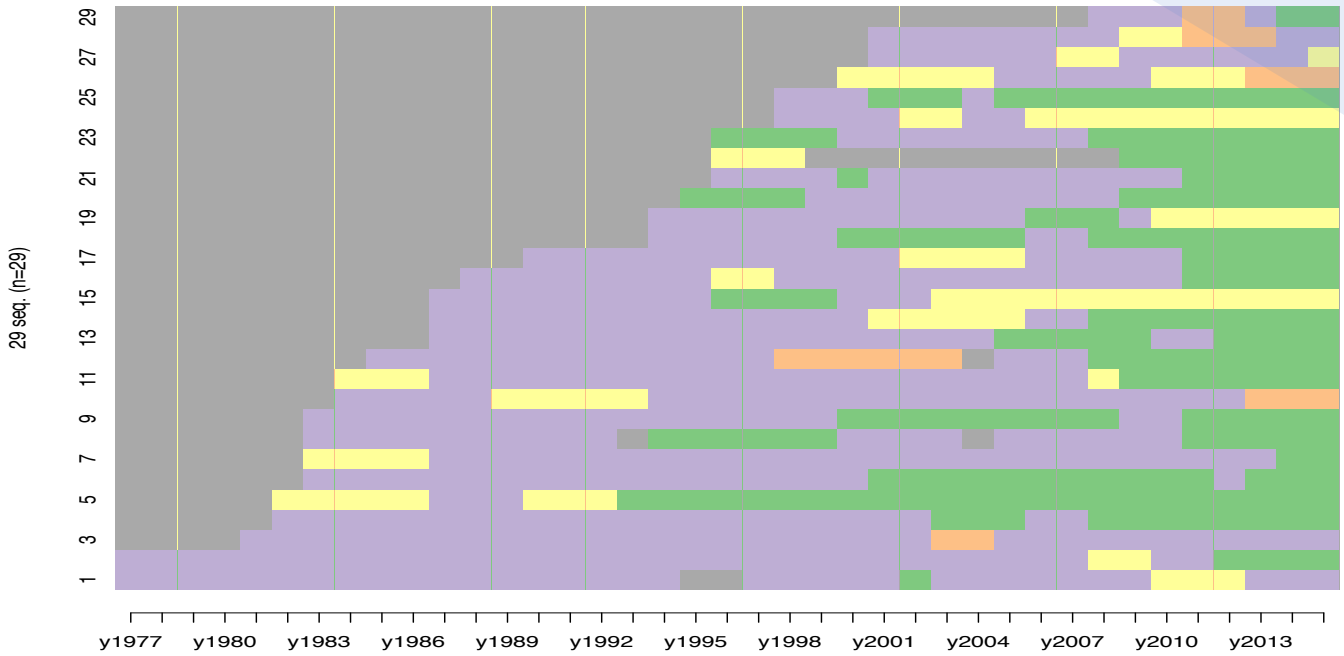
Inter-professional career transitions



Which company appears first in analyst careers ?



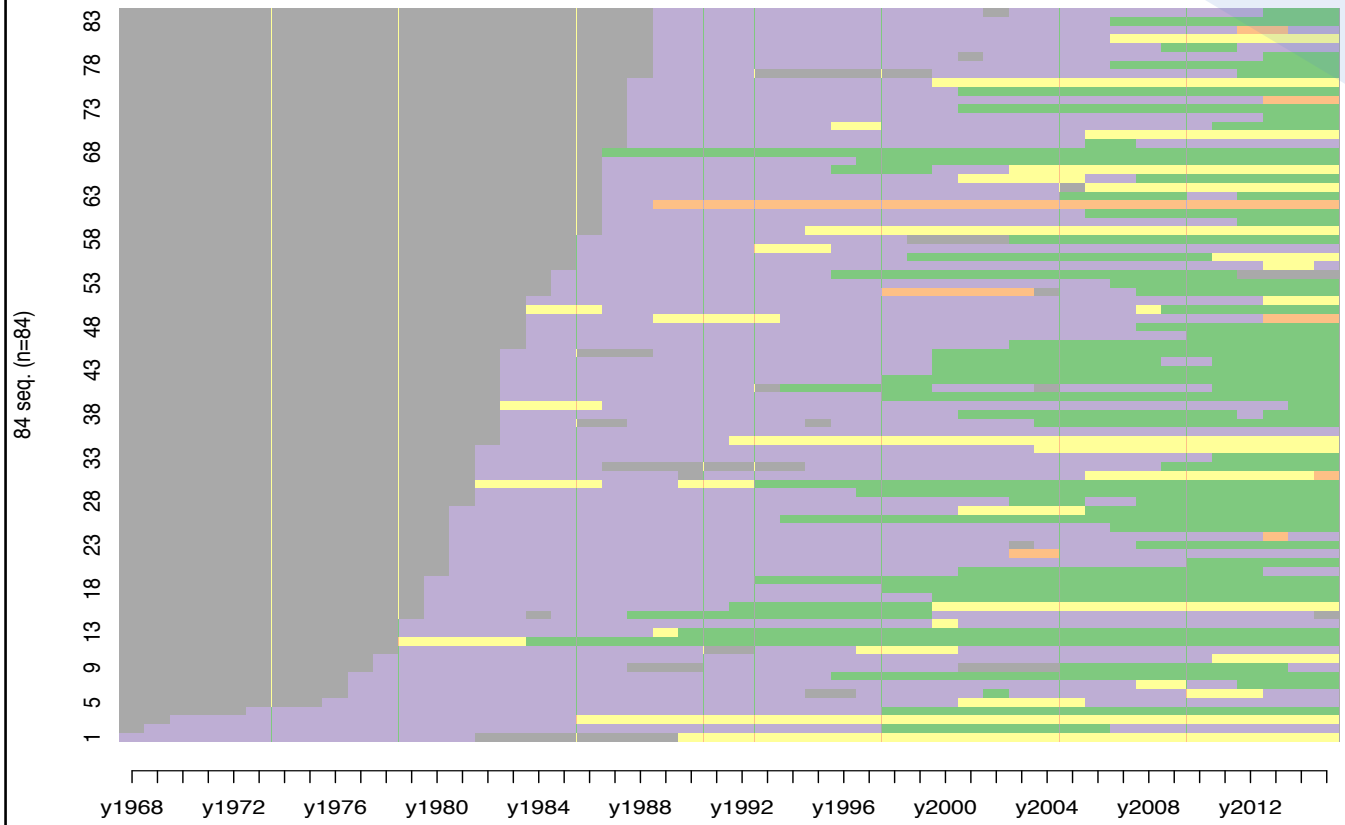
Do people stay in Big Tree?



Legend:

Purple	**Jobs in non-analyst companies**
Yellow	**Jobs in smaller analyst houses**
Green	**Jobs in Big Three analyst houses (Gartner, Forrester, IDC)**
Orange	**Jobs in one-person analyst houses**
Grey	**no data.**

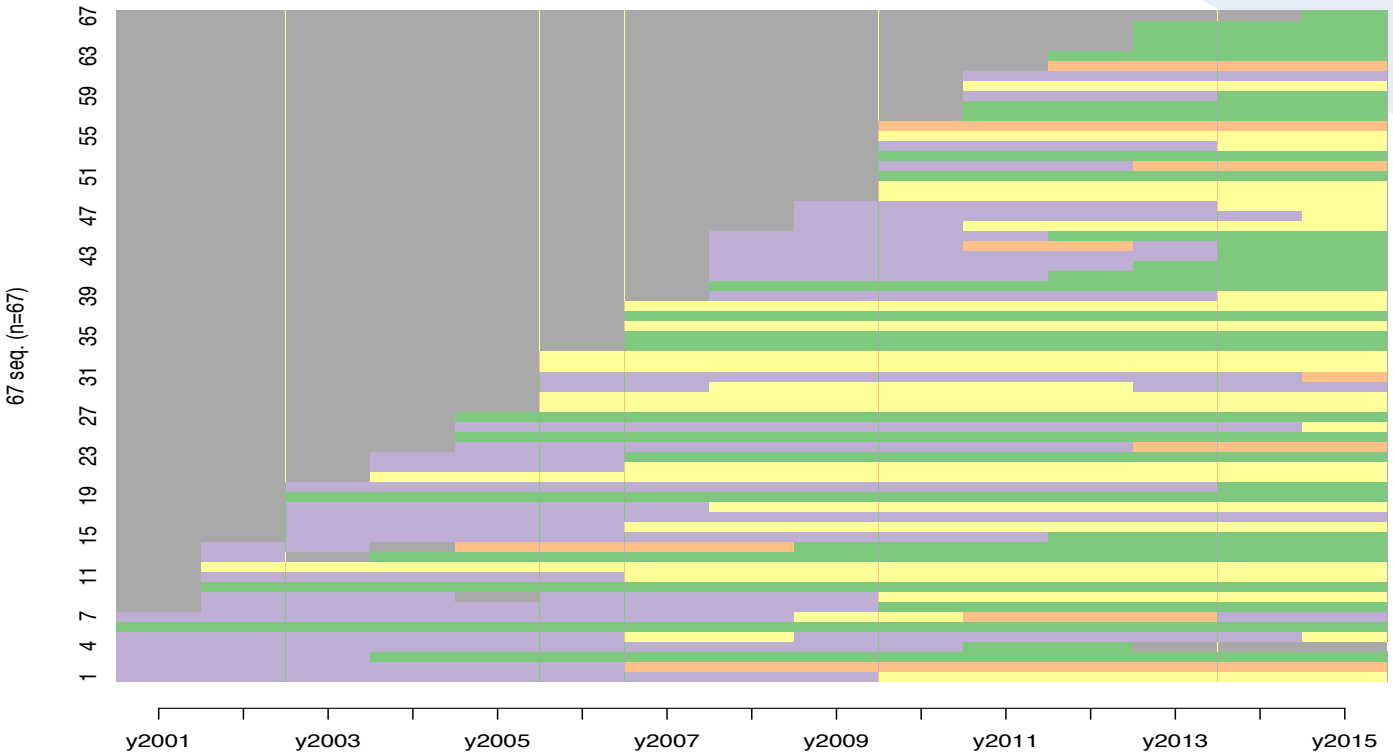
Careers started before 1990



Legend:

Purple	Jobs in non-analyst companies
Yellow	Jobs in smaller analyst houses
Green	jobs in Big Three analyst houses
Orange	jobs in one-person analyst houses
Grey	no data.

Careers started after 2000



Legend:

Purple	Jobs in non-analyst companies
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Statistical tests for the full sample

- Measure of turbulence (Elzinga and Liefbroer, 2007)
- Cluster analysis based on a definition of career outcome as an ordinal variable
- Combining survival and sequence analyses (Rossignon et al., 2016)

Potential Benefits for Policy Makers

- **Career Transparency**: contribute to the urgent quest for career transparency on most attractive jobs that emerges from policy attempts to address the growing IT skill gap
- **Career Mapping**: develop career counselling services for IT professionals, inspired by the AHIMA Career Map and address the highly unstructured nature of careers in the ICT sector, which makes less and less people take up vocational education in the ICT domain.