



Intellectual
Property
Office

Identifying potentially commercially disruptive technologies



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Need to identifying emerging technology



Building our Industrial Strategy

Green Paper
January 2017

Current emerging tech work/new approach

- Benson CL, Magee CL (2015) Quantitative Determination of Technological Improvement from Patent Data
- Carley SF, Newman NC, Porter AL, Garner JG (2017) A measure of staying power: Is the persistence of emergent concepts more significantly influenced by technical domain or scale?, *Scientometrics*
- Erdi P, Makovi K, Somogyvari Z, Tobochnik J, Volf P, Zalanyi L (2012) “Prediction of emerging technologies based on analysis of the US patent citation network” *Scientometrics* (2013)
- Daim T, Rueda G, Martin H, Gerdtsri P (2005) “Forecasting emerging technologies: Use of bibliometrics and patent analysis”
- Buchanan B, Corken R (2010) *Disruptive technology: a toolkit*,

The seven basic plots

- Overcoming the monster
- Rags to Riches
- The Quest
- Voyage and Return
- Comedy
- Tragedy
- Rebirth

"This is the most extraordinary, exhilarating book." FAY WELDON

THE SEVEN BASIC PLOTS

Why we tell stories



CHRISTOPHER
BOOKER



Our question

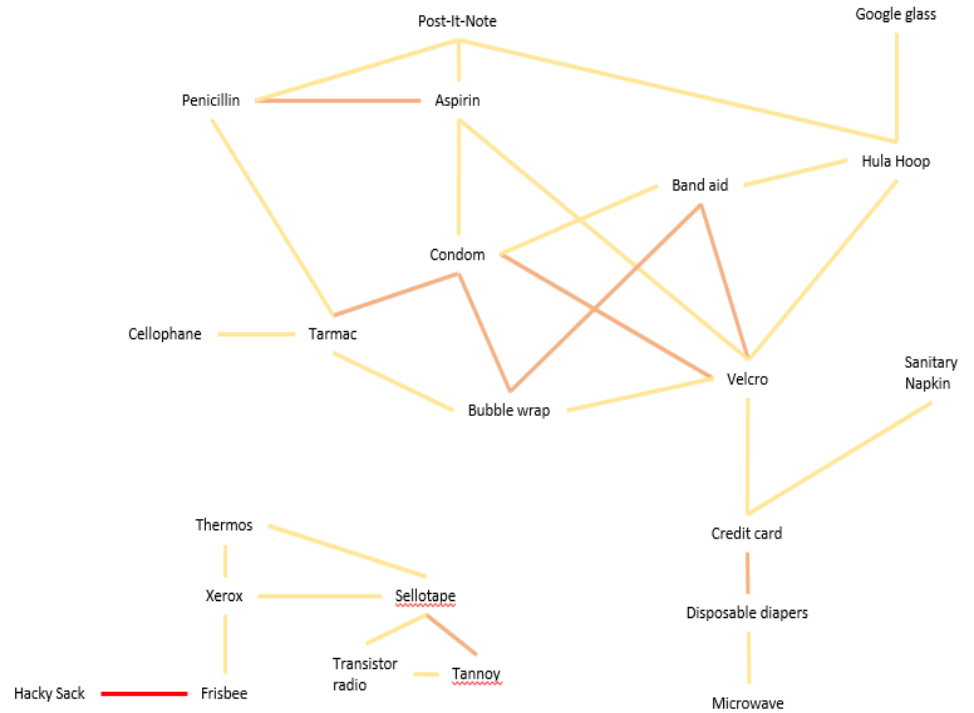
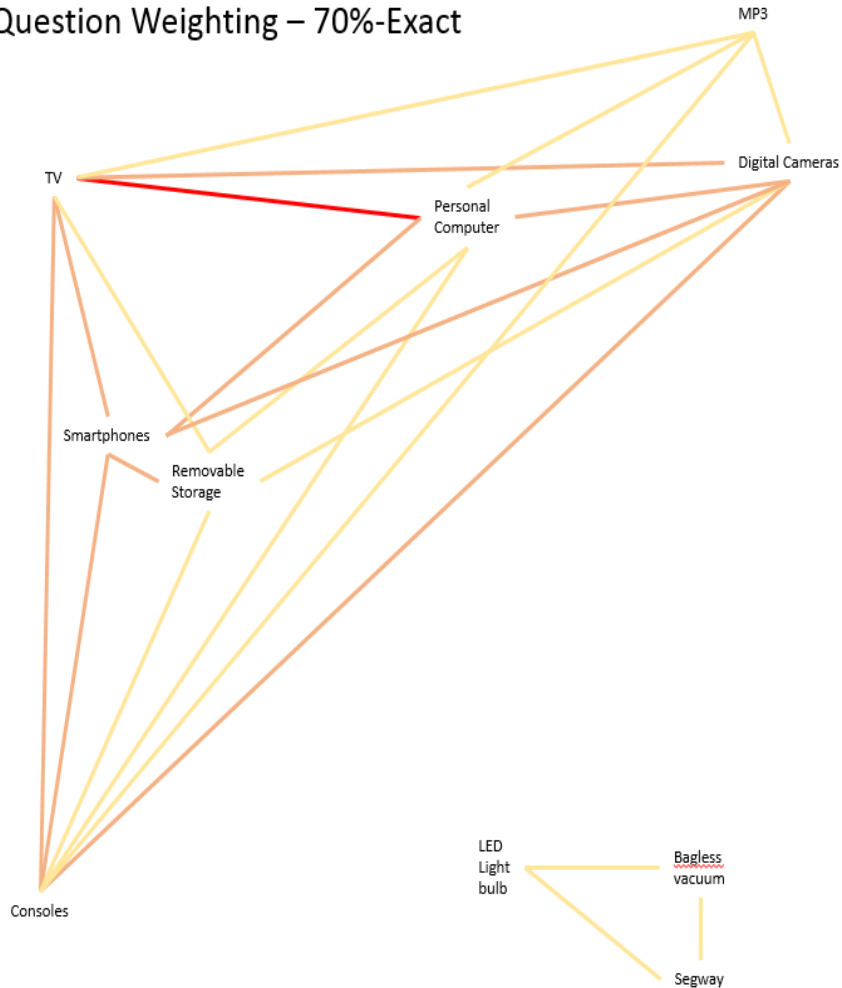
Can the patenting behaviour surrounding historically ground breaking products be used to identify ground breaking, disruptive or emerging technologies?

Back stories

Discovery rather than invention	One main player	Few improvements on ground breaker	Mainly generic products	Individual developed
Invention rather than discovery	Industry with a small number of big players	A number of generations following ground breaker and then minimal improvements	Some generic followers	Firm developed
Main players have changed over time	Industry with a large number of players		No generic followers	Tech worked on and developed by separate companies
			Luxury Good	
Main players are the same over time	Ground breaker internationally developed	Still regular new generations	Notable time between original tech invention and ground breaking product	Ground breaking product purchased by a larger firm
Main players have been added to over time	Ground breaker nationally developed	A number of iterations before take off		

Clustering

Question Weighting – 70%-Exact



Colour	Description
Red	90-100
Orange	80-90
Yellow	70-80
Green	60-70

Bobcat	—	Cats eyes
Vaseline	—	Dry Ice
Mimeograph	—	Biro

Data

- Ground breaking technology area
- Ground breaking applicant
- 400 + variables

Total patent applications/granted

Applicant type

Holdings

Existing/new applicants

Inventors

Family

Citations

IPC

Unclassifiable IPC

Next steps

1. Identify variables synonymous within the ground breaking technology groups
2. Group patent data into technology groups and search for patterns like those synonymous with ground breaking technology groups

Data science



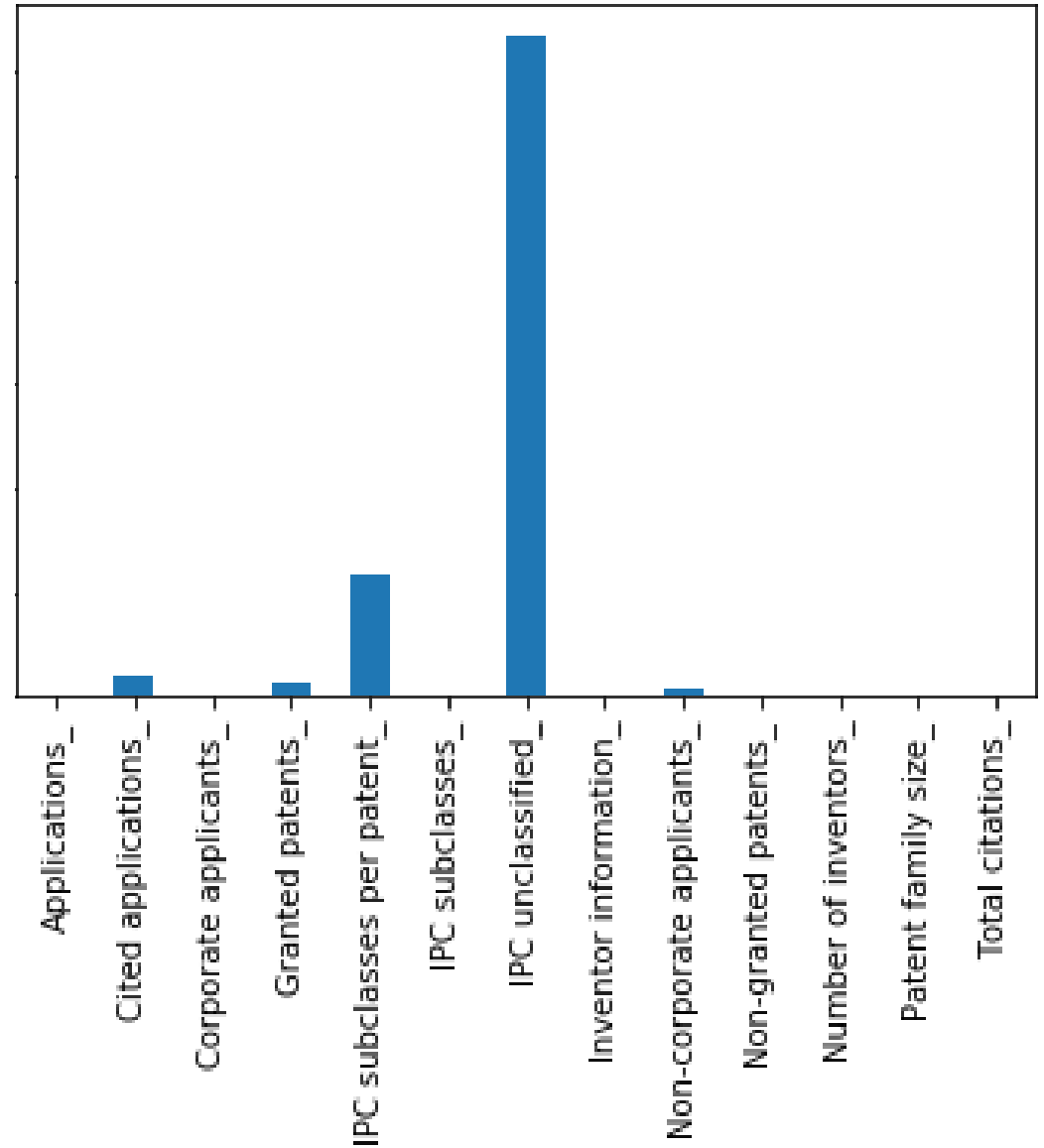
Provisional results

Ground breaking firms

vs

Ground breaking
technology area

Feature Importances



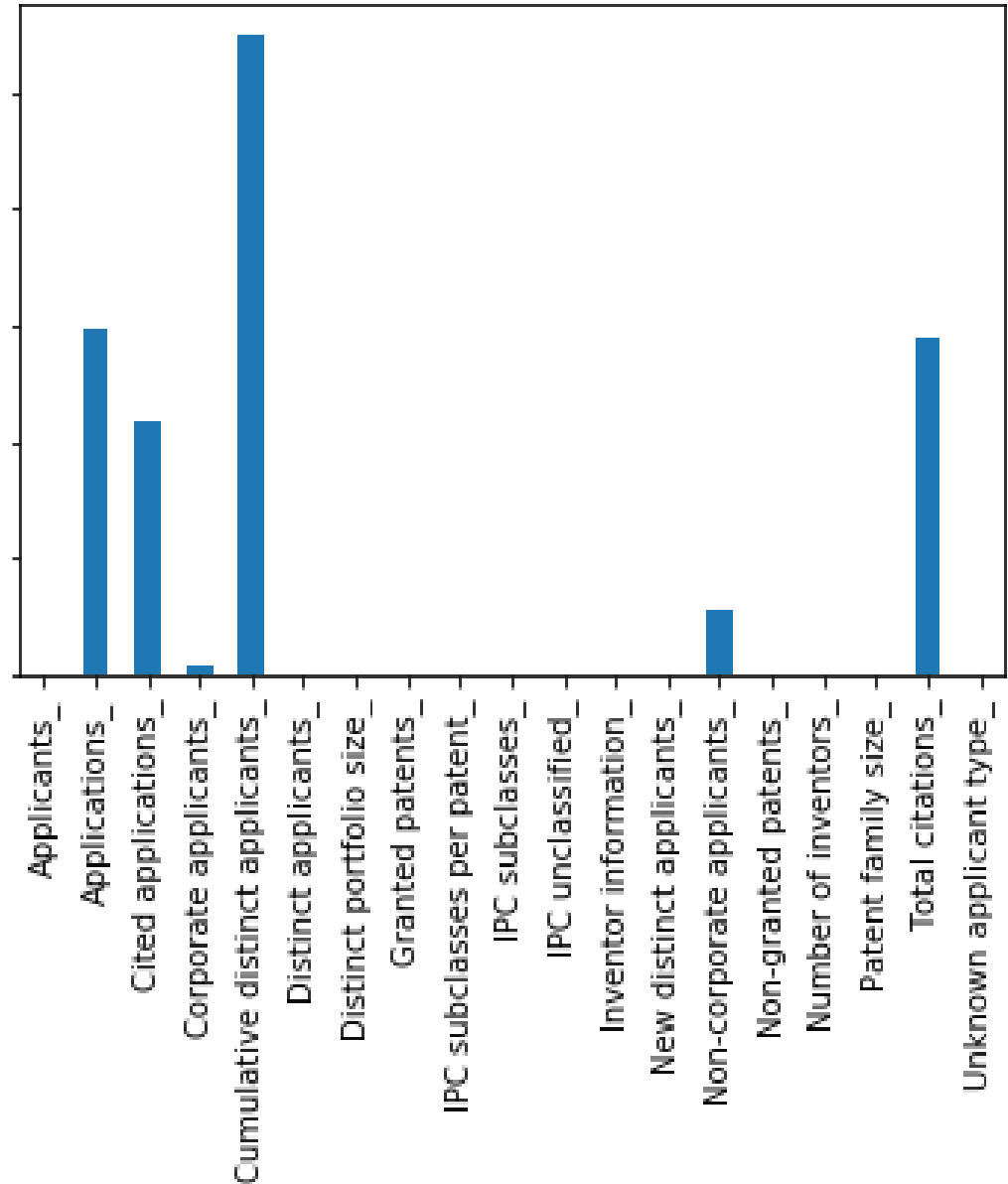
Provisional results

High tech ground
breaking technology
area

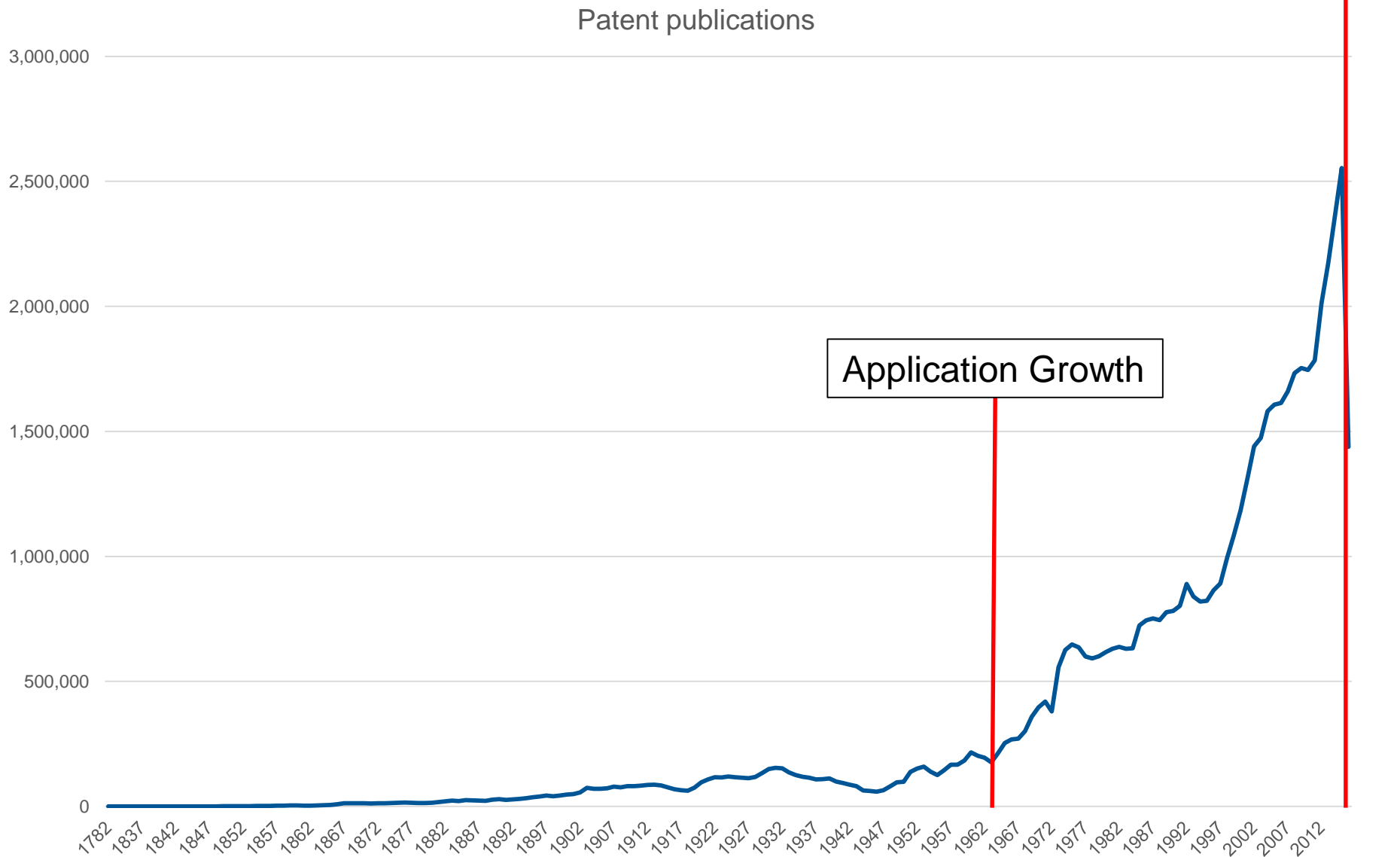
vs

All other ground
breaking technology
areas

Feature Importances

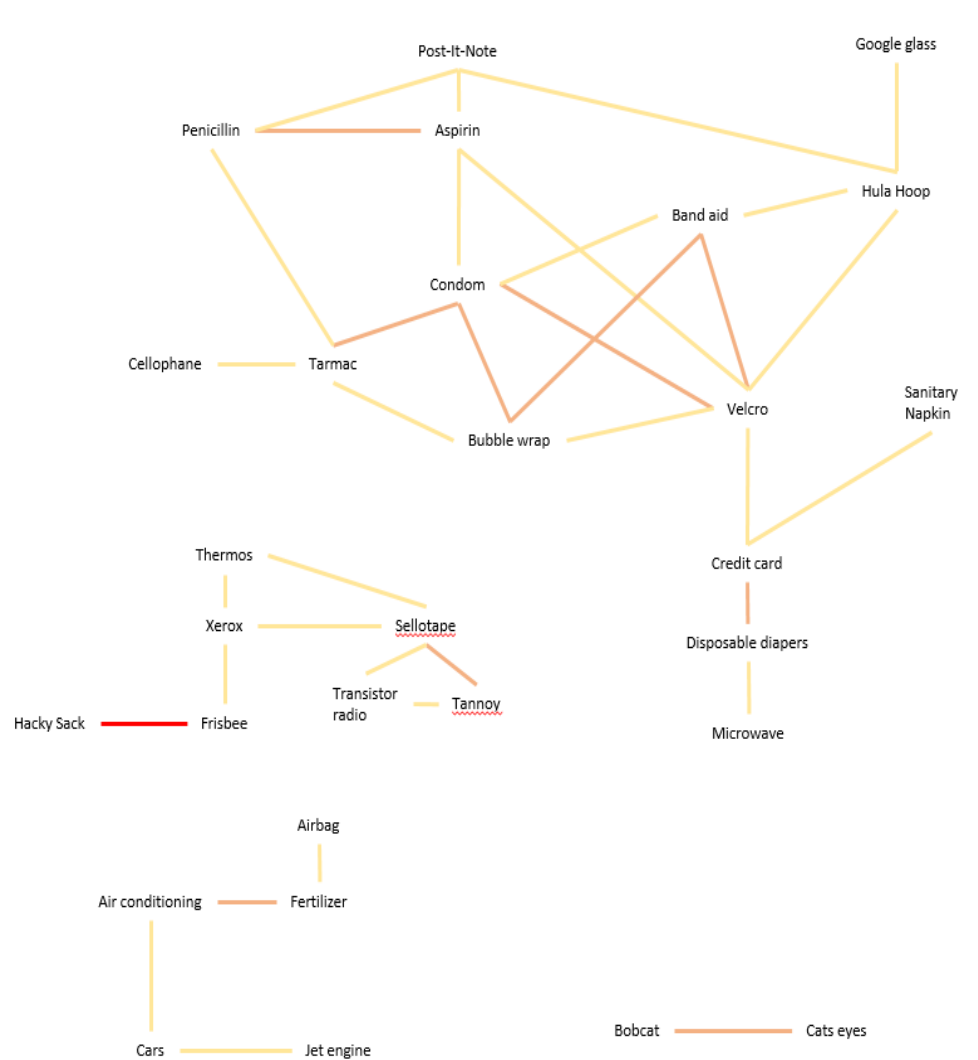
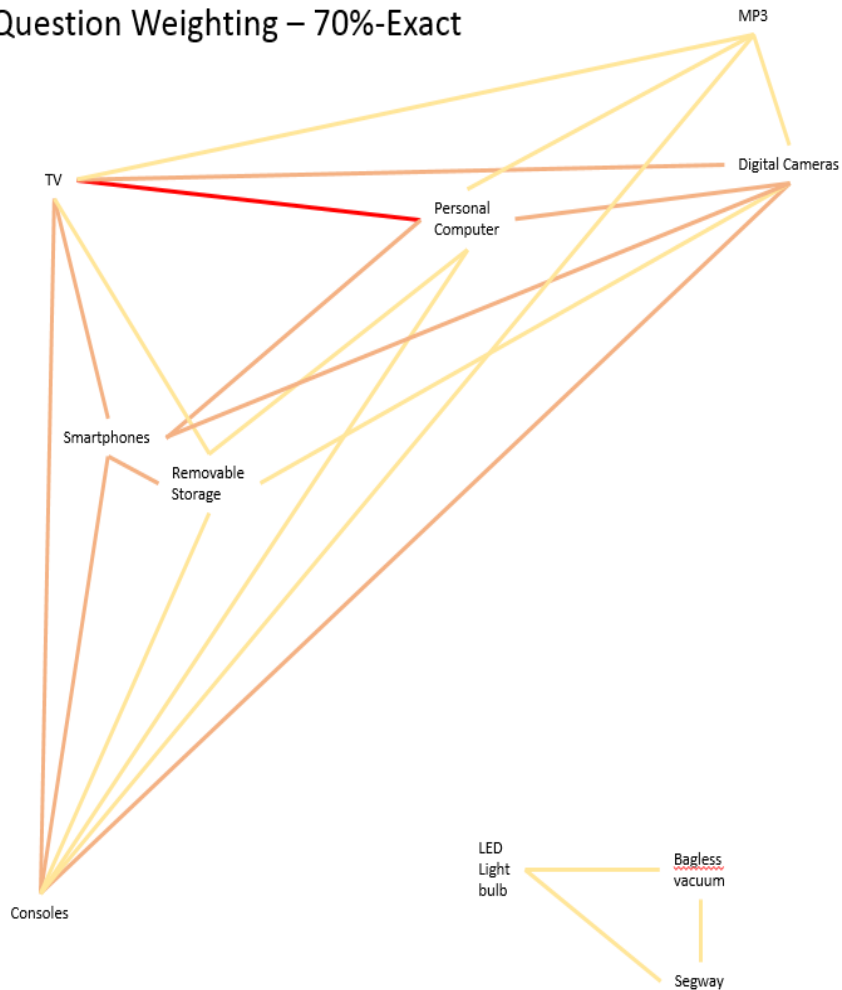


Data coverage 1



Data coverage

Question Weighting – 70%-Exact

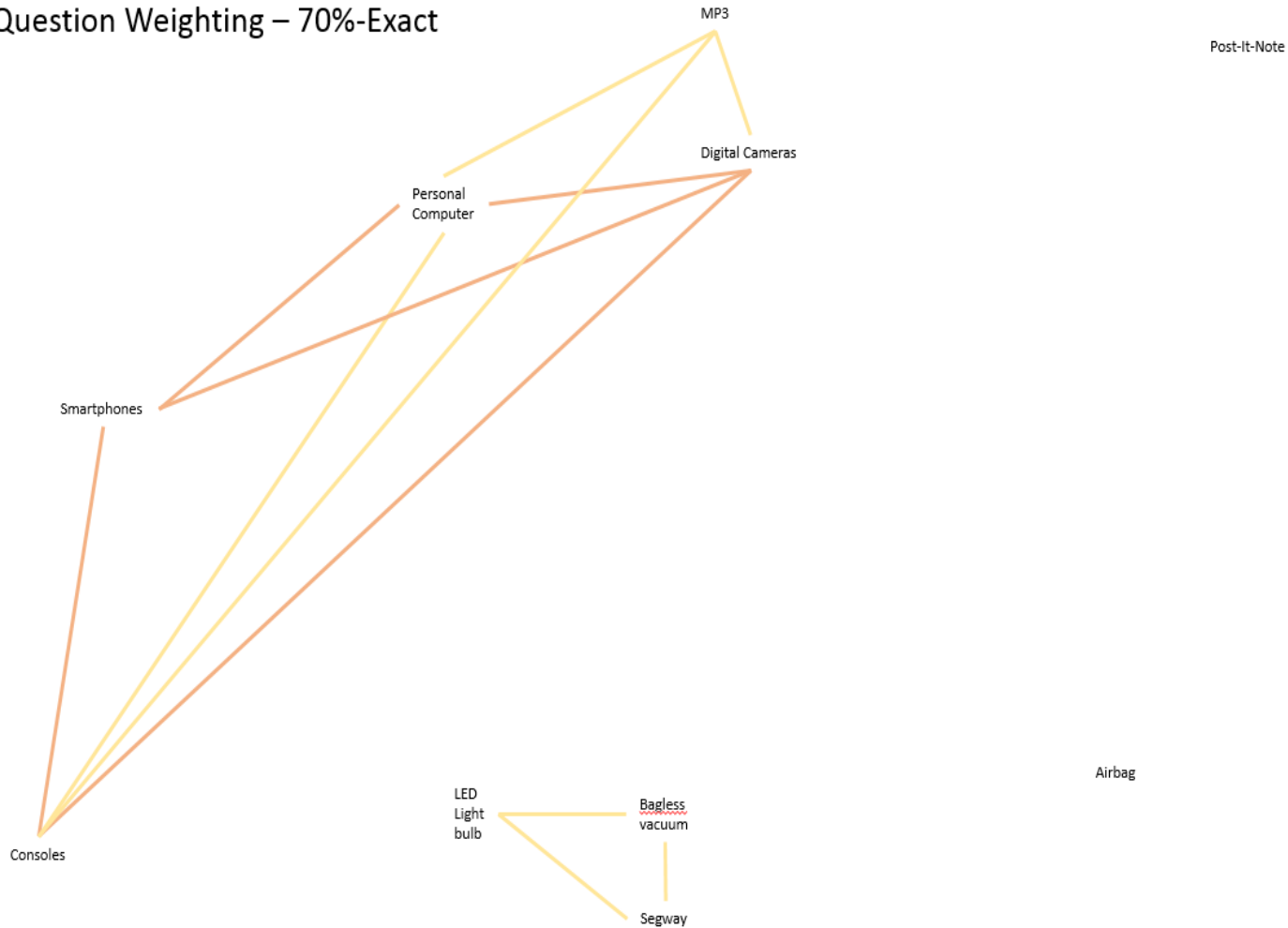


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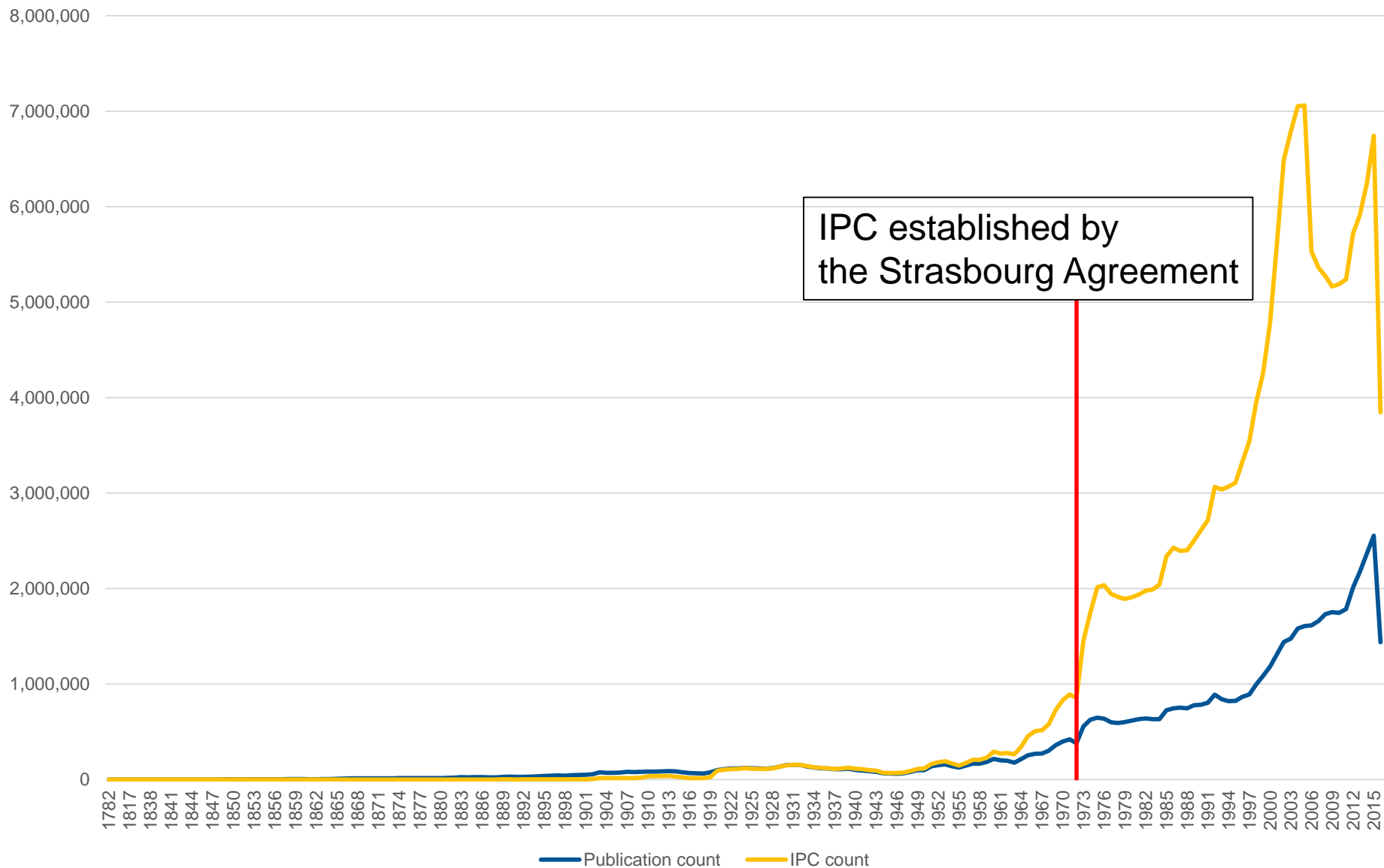
Data coverage

Question Weighting – 70%-Exact



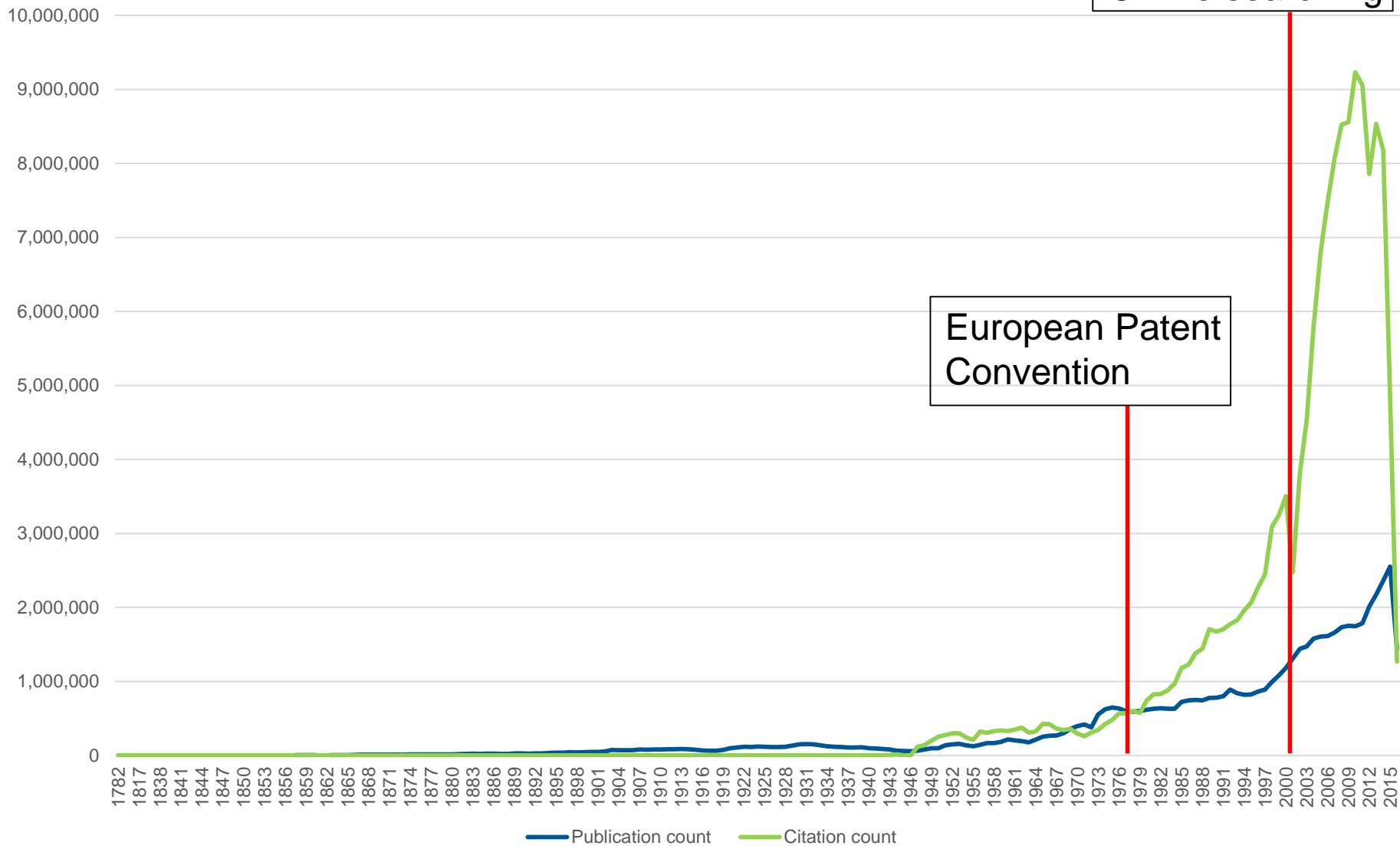
Data coverage 2

Patent publications and IPC



Data coverage 3

Patent publications and citations



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Thank you for listening

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