

# OxValue.AI:

## A New Platform for The Valuation of Technology

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# Motivation

- The importance of tech. transfer & commercialisation
- The bottleneck & limitations of existing valuation tools
  - Subjectivity & high variation
  - High cost
  - Not suitable for early stage tech. and startups
- Objective: **A new valuation method for technology based on the intrinsic characteristics of the technology**

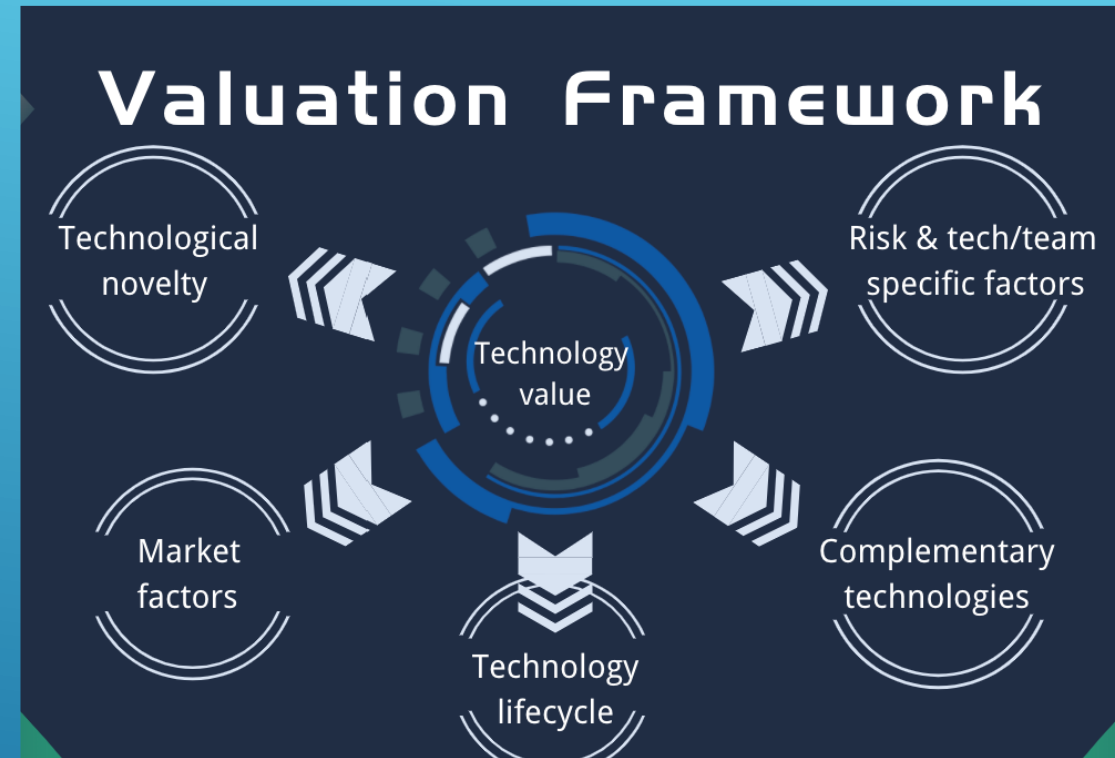


# Beneficiaries

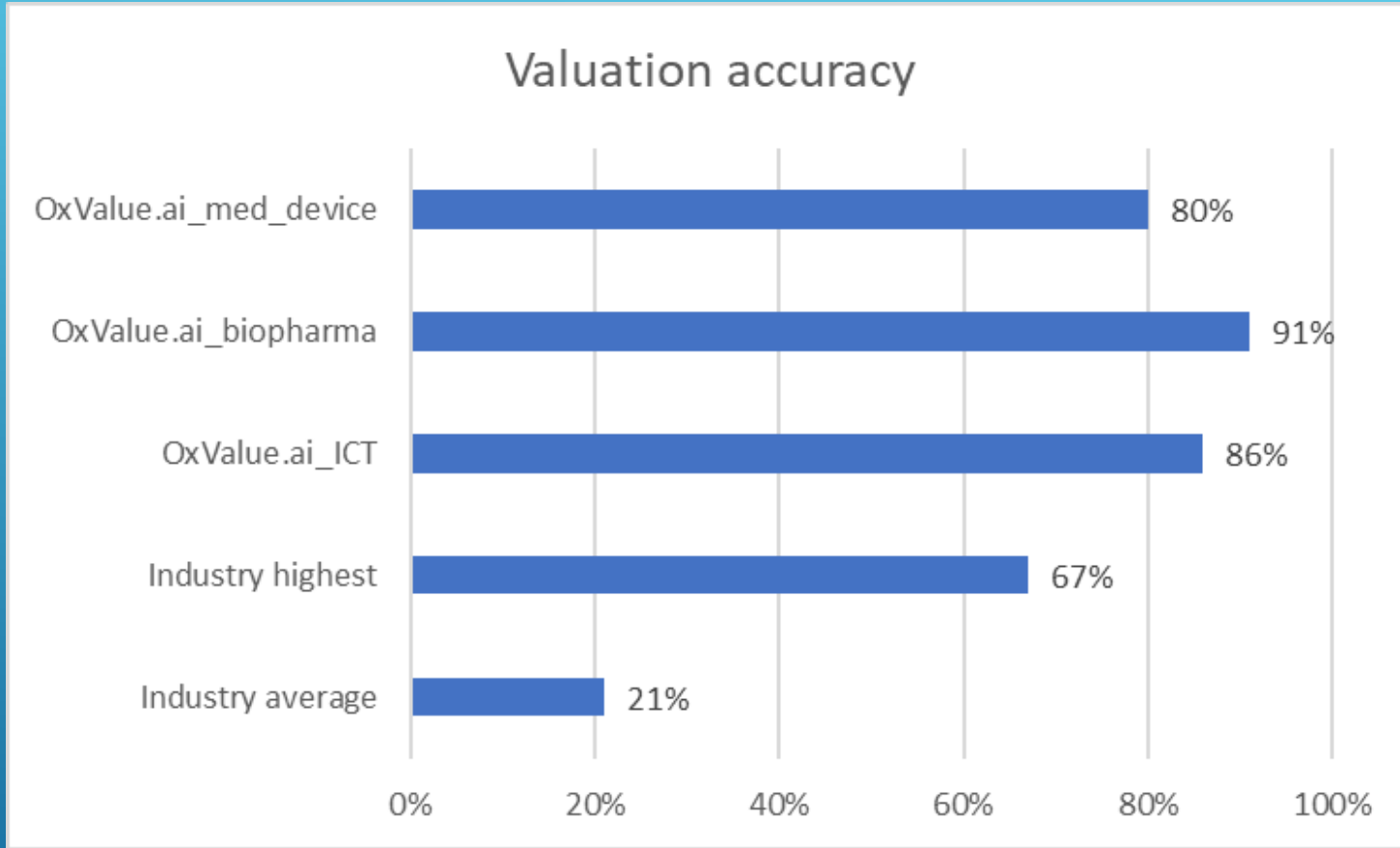
- Academic communities: research & teaching
- Innovation investors, both public & private, MNEs
- Inventors, University technology transfer offices
- Consulting companies
- WIPO and national patent offices
- International organisations – for int'l technology transfer
- National governments, e.g. statistical offices, to improve GDP measurement

# Theoretical and methodological framework

- **A utility theory of technology value**
- Industry by industry, start from digital technology
- Methodologies & Data
- UK Start-ups 2006 – 2018, in ICT, biopharma, med. devices industries
- Bibliographic details of relevant patents,
- Market, complement tech & tech life lifecycle data
- **Econometrics, machine learning & deep learning**



# Outcomes (1)

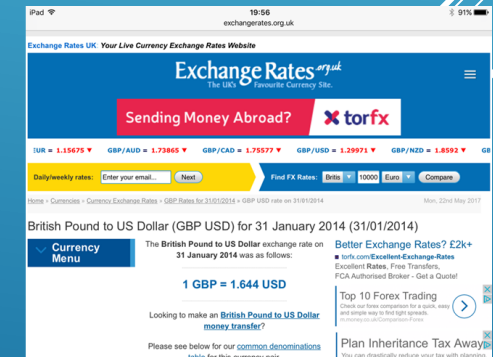
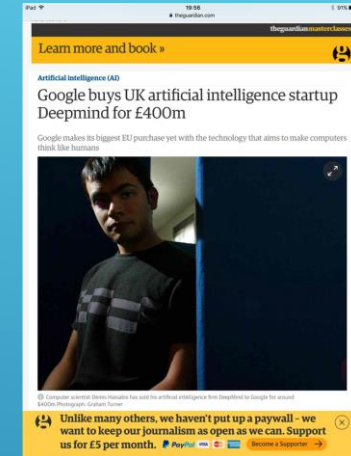


Source: Damodaran, A., & Damodaran, A. (2002, 2012). Investment Valuation - Tools and Techniques for Determining the Value of Any Asset, 3rd ed., Vol. 519, New York: J. Wiley & Sons).



# Outcomes (2)

- Explanatory power of the **F-A-L model**: Adjusted  $R^2$ : 86%
- Younger start-ups higher Adj.  $R^2$  : 90-95%
- Estimated value of Deepmind in 2014: USD590-650 million
- Google paid USD640 million
- Also tested Oculus, USD200-230m, Facebook paid USD200m.
- Patents applied: US, EPO and China



# AI-Powered Valuation Method Outcome (3)

- Other sector: Pharmaceutical (2020-21)  
    Medical devices
- Other country: US (2018-19)
- Non-patent IPs: trade mark, copyright (18-19)
- Competition & strategy: Auction theory (2018-19)

	CUM	FMEAN	FMAX	D5	D10	D15
POOLED OLS	0.615	0.595	0.6	0.608	0.601	0.596
FIXED EFFECT	0.400	0.403	0.392	0.422	0.414	0.405
RANDOM EFFECT	0.541	0.511	0.54	0.492	0.484	0.491
SVR	0.634	0.669	0.652	0.291	0.222	0.223
RIDGE	0.580	0.541	0.56	0.58	0.555	0.564
RANDOM FOREST	0.849	0.827	0.817	0.809	0.805	0.742
EXTRA TREES	0.913	0.895	0.899	0.901	0.883	0.858
XGBOOST	0.870	0.864	0.854	0.817	0.821	0.799

*Note.* This table shows the summary of R-square using different models based on different calculation methods. We use the linear-regression model including pooled OLS, fixed effect and random effect model, and non-linear model including SVR, Ridge, random forest, extra trees and XGBoost. Note that the results of supervised machine learning models (i.e., row 3 to row 8) are the average result after running five times of the algorithm. We use six cumulative methods to aggregate the patent-level data to firm-level and the detailed construction method can be found in Appendix 1.

# AI-Powered Valuation Method: Outcome 4

Adding text analysis using deep learning improved but only by 1-2%.

Models	Novelty	Market	Risk	Regulation	Lifecycle	Test $R^2$
Random tree	x					0.696
Random tree	x	x				0.821
Random tree	x	x		x	x	0.836
Random tree	x	x	x	x	x	0.849
Extra tree	x					0.693
Extra tree	x	x				0.840
Extra tree	x	x		x	x	0.848
Extra tree	x	x	x	x	x	0.913
XGBoost	x					0.697
XGBoost	x	x				0.804
XGBoost	x	x		x	x	0.816
XGBoost	x	x	x	x	x	0.870

*Note:* The results of supervised machine learning models are the average result after running five times of the algorithm.





# Economic & social usefulness

- Promote more investment into innovation
- Facilitate international technology transfer
- Help IP commercialisation & value creation
- Help high growth firm identification,
- Help SMEs and small investors
  
- Collaborate with UN, WIPO, WB & help global tech. transfer
- Help IP offices: IP management, identification and value creation
- Help IP offices & governments: Improve measurement of GDP
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- Fund research & studentship in IP related research, esp. LDCs.

# OxValue.AI

Making technology valuation objective,  
accessible and affordable.

Promoting investment in innovation &  
facilitating technology transfer internationally,  
in both the developed & developing countries

<https://www.oxvalue.ai/>