

Strategic Technology and Innovation Management Programme 2018

Intellectual Property Analytics for Technology Strategic Decision Making

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Big data is increasingly available in all areas of manufacturing and operations. In this research, we apply artificial intelligence technologies to analyze intellectual property data and complement human judgement for strategic decision making along the innovation technology development process.

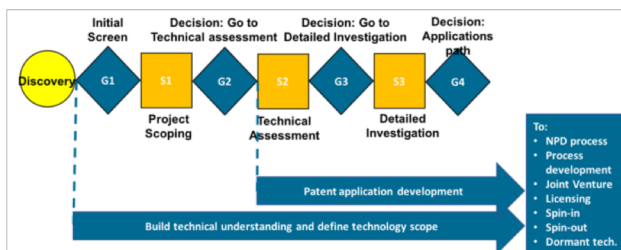
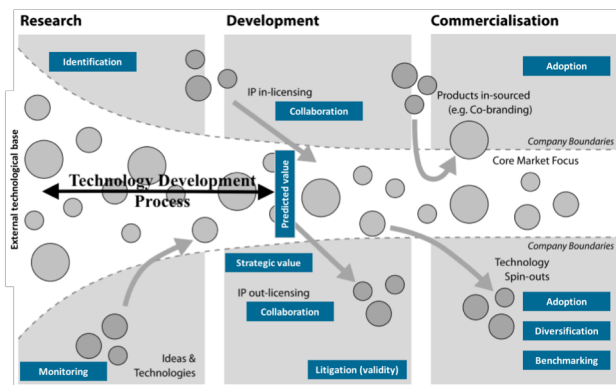
Deliverables

- Machine learning applications in technology management with IP data
- Report on the model

Results

Summary

- It is possible to forecast the technological impact of a patented invention, using multiple patent indicators. An accuracy of 61.1% was achieved when predicting the number of citations within 4 years



Aims

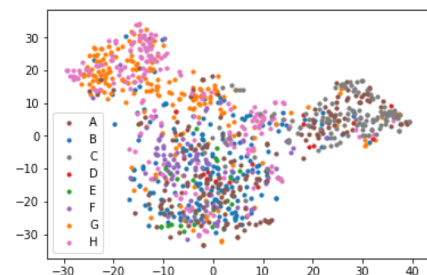
To apply artificial intelligence technologies within the technology development process models to evaluate technology decisions

Progress

- Literature review completed, published a working paper on IPA
- Deep learning incorporation within the innovation process concept completed
- **Three models with accuracy of 61%**
- Expand the model to incorporate more features (**future industrial engagement**)
- Complete 2-3 case studies to evaluate the model in a firm environment (**future industrial engagement**)

Inputs	Model 1	Model 2	Model 3
	<ul style="list-style-type: none"> • Number of independent claims • Number of dependent claims • Radicalness Index 	<ul style="list-style-type: none"> • Primary IPC Section • Abstract (embedded) 	<ul style="list-style-type: none"> • Primary IPC Section • Abstract (embedded) • Number of backwards citations • Number of dependent claims • Radicalness Index • Originality Index
Outputs	• Grant Lag	• Citations within 4 Years	• Citations within 4 Years
Accuracy	35.4%	60.1%	61.1%

- Effectiveness of t-sne of clustering the word2vec models for language models



Published papers

- Aristodemou, L., & Tietze, F. (2018). The state-of-the-art on Intellectual Property Analytics (IPA): A literature review on artificial intelligence, machine learning and deep learning methods for analysing intellectual property (IP) data. World Patent Information, 55 37-51. <https://doi.org/10.1016/j.wpi.2018.07.002>
- Aristodemou, L., & Tietze, F. A literature review on the state-of-the-art on intellectual property analytics. <https://doi.org/10.17863/CAM.13928>