

AI-Based Business Models

Business Models for the Digital Economy
Master in Informatics and Computing Engineering
FEUP
December 2022
João Claro

Agenda

- Creating value from AI
 - AI enablers and capability
 - Patterns and dynamics of opportunities
 - Managerial implications
- Delivering and capturing value from AI
 - Delivery: operations – core, organisation and operating model
 - Capture: competition and strategy – performance drivers, positioning and resources – and risk governance

Creating value from AI (1/2)

| Change and AI | Prediction and judgement in tasks | | | |
|---|---|---------------------|----------------------|--------------------|
| Enablers <ul style="list-style-type: none">Lower cost – exponential improvements in information technologyHigher value – data availability from increasing digitisation Capability <ul style="list-style-type: none">Prediction – abundant and inexpensive – incursion into ever more challenging problems | <pre>graph TD Data --> Prediction Prediction --> Judgment Judgment --> Action Action --> Outcome Outcome --> Feedback Feedback --> Prediction Outcome --> Judgment</pre> | Ease of description | Example | Moving target |
| | | High | Language translation | |
| | | Partial | E-mail automation | <div>Full</div> |
| | | Low | Medicine | <div>Partial</div> |
| | | | | |
| Managerial challenges <ul style="list-style-type: none">Automation is more than just prediction – data collection, judgment, actionValue in tasks that are complementary to prediction – judgment, e.g., ethical judgment, emotional intelligence, creativityValuable managerial talents and expertise – how best to apply AI – current and future opportunities for predictionShift training, assess change and pace the shift, develop hybrid processes | | | | |

Agrawal et al. (2017)

Creating value from AI (2/2)

| Examples | Data and prediction | Judgment and action | Outcome and feedback | Expanding prediction |
|-----------------------------|---|---|--|--|
| Language translation | <ul style="list-style-type: none"> Multiple translations of the same text Propose translation of new text | <ul style="list-style-type: none"> Light and focused review Correct specific parts of translation | <ul style="list-style-type: none"> Appropriate translation adopted Feedback of corrections | <ul style="list-style-type: none"> Learning from context and specific corrections |
| E-mail automation | <ul style="list-style-type: none"> E-mail response exchanges Propose several short responses | <ul style="list-style-type: none"> Choose appropriate response Select from list of choices | <ul style="list-style-type: none"> Appropriate response sent Feedback of choice selected | <ul style="list-style-type: none"> Learning from choices to better describe judgment and automation |
| Medicine | <ul style="list-style-type: none"> Annotated images of diagnostics, e.g. Proposal of medical diagnostics | <ul style="list-style-type: none"> Medical judgment Effective therapy | <ul style="list-style-type: none"> Better patient care Feedback of decisions on care and clinical outcomes | <ul style="list-style-type: none"> Learning from therapies and outcomes to better describe judgment and improve support |

Agrawal et al. (2017)

Delivering and capturing value from AI (1/2)

| Business | Core | Resources and capabilities | Organisation and operating model |
|--------------------|--|--|---|
| Traditional | <ul style="list-style-type: none"> Business processes Operated by workers, managers, process engineers, supervisors, customer service representatives Reinforced by traditional information technology systems | <ul style="list-style-type: none"> Different across industries Specialised vertical expertise Standardised, predictable and repeatable tasks by people | <ul style="list-style-type: none"> Focus and specialization underlie scale, scope and learning economies Leading to siloed structures, reinforced by information technology |
| AI-Based | <ul style="list-style-type: none"> AI Factory – decision-making as a science: predictions guide and automate operation and workflows <ol style="list-style-type: none"> 1. Data pipeline 2. Algorithms 3. Experimentation platforms 4. Infrastructure | <ul style="list-style-type: none"> Universal Network position, unique data, sophisticated analytics Dislocation of some traditional capabilities, enrichment of other, require new capabilities | <ul style="list-style-type: none"> Integrated core of data and unified, consistent code base Avoid deep organisational divisions – confront silos, retool culture |

Iansiti & Lakhani (2020)

Delivering and capturing value from AI (2/2)

| Business | Performance drivers | Strategy/Positioning | Risk governance |
|-------------|--|--|--|
| Traditional | <ul style="list-style-type: none"> Scale, scope and learning economies enabled by carefully defined core capabilities, limited by diminishing returns | <ul style="list-style-type: none"> Focus on traditional industry analysis Stick with known businesses in well-understood industries | <ul style="list-style-type: none"> Well-established risk management, regulation and government intervention on less complex challenges |
| AI-Based | <ul style="list-style-type: none"> Faster scaling with AI processes Larger scope enabled by connections to other digitized businesses Ever more learning and improvement <p>Initial delay – critical mass for network effects and cold start for data – followed by steep increase in value and share</p> | <ul style="list-style-type: none"> Connect businesses, aggregate flowing data and extract value through analytics and AI Think beyond traditional industry context – highly connected AI-enabled services to transform and unleash value | <p>Connected and frictionless</p> <ul style="list-style-type: none"> Information diffusion Reaction cascading <p>Related risks</p> <ul style="list-style-type: none"> Spread of bias & misinformation Failure in large unproven institutions Impact of privacy and cybersecurity incidents Market concentration, dislocations, inequality <p>Multidisciplinary governance</p> <ul style="list-style-type: none"> Legal, corporate affairs Deep thinking about legal and ethical challenges |

Iansiti & Lakhani (2020)

References

- Agrawal, A.K., Gans, J.S., & Goldfarb, A. (2017). What to expect from artificial intelligence. MIT Sloan Management Review. 58(3), 23-27.
- Iansiti, M., & Lakhani, K. (2020). Competing in the age of AI: How machine intelligence changes the rules of business. Harvard Business Review, 98(1), 60-67