

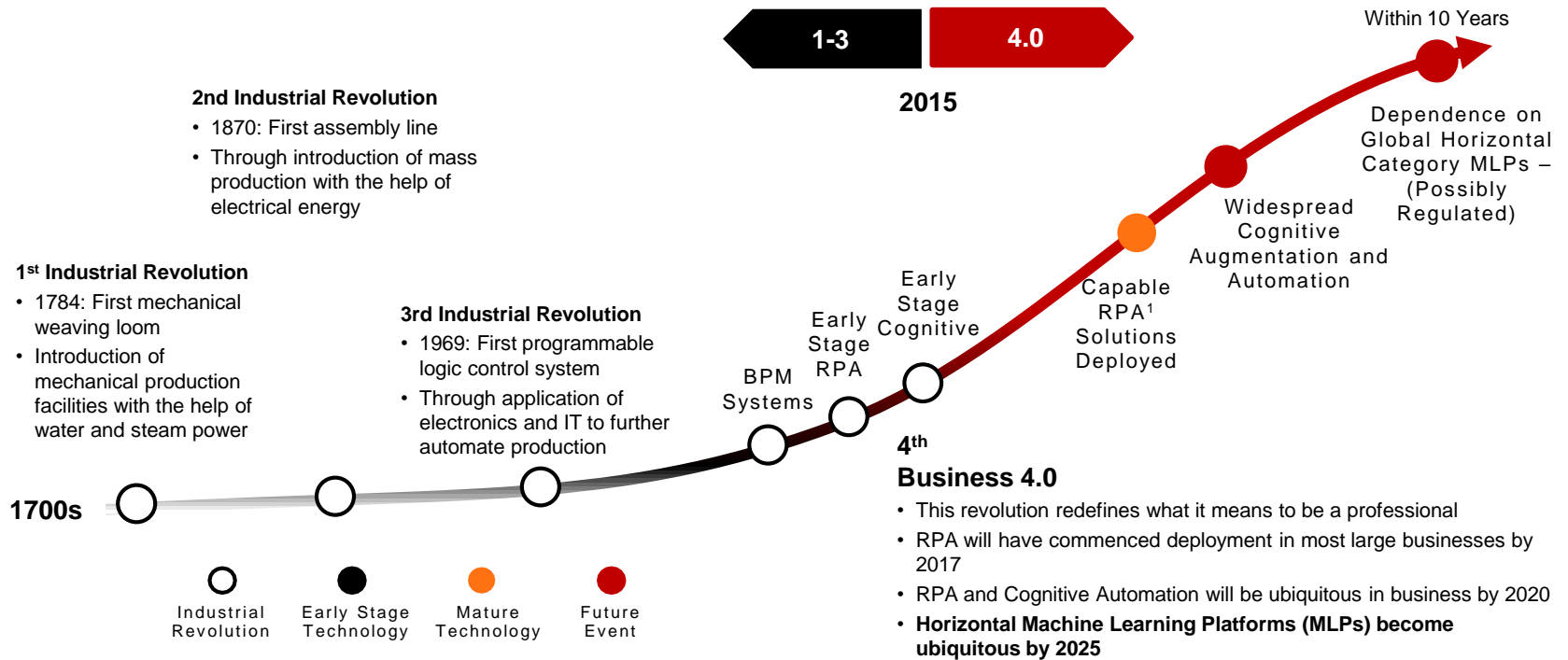


QUANTIFYING RISK, ENABLING OPPORTUNITY

The Future of Actuarial Work

Lukas Ehlers & Shuaib Ghoor
September 2018

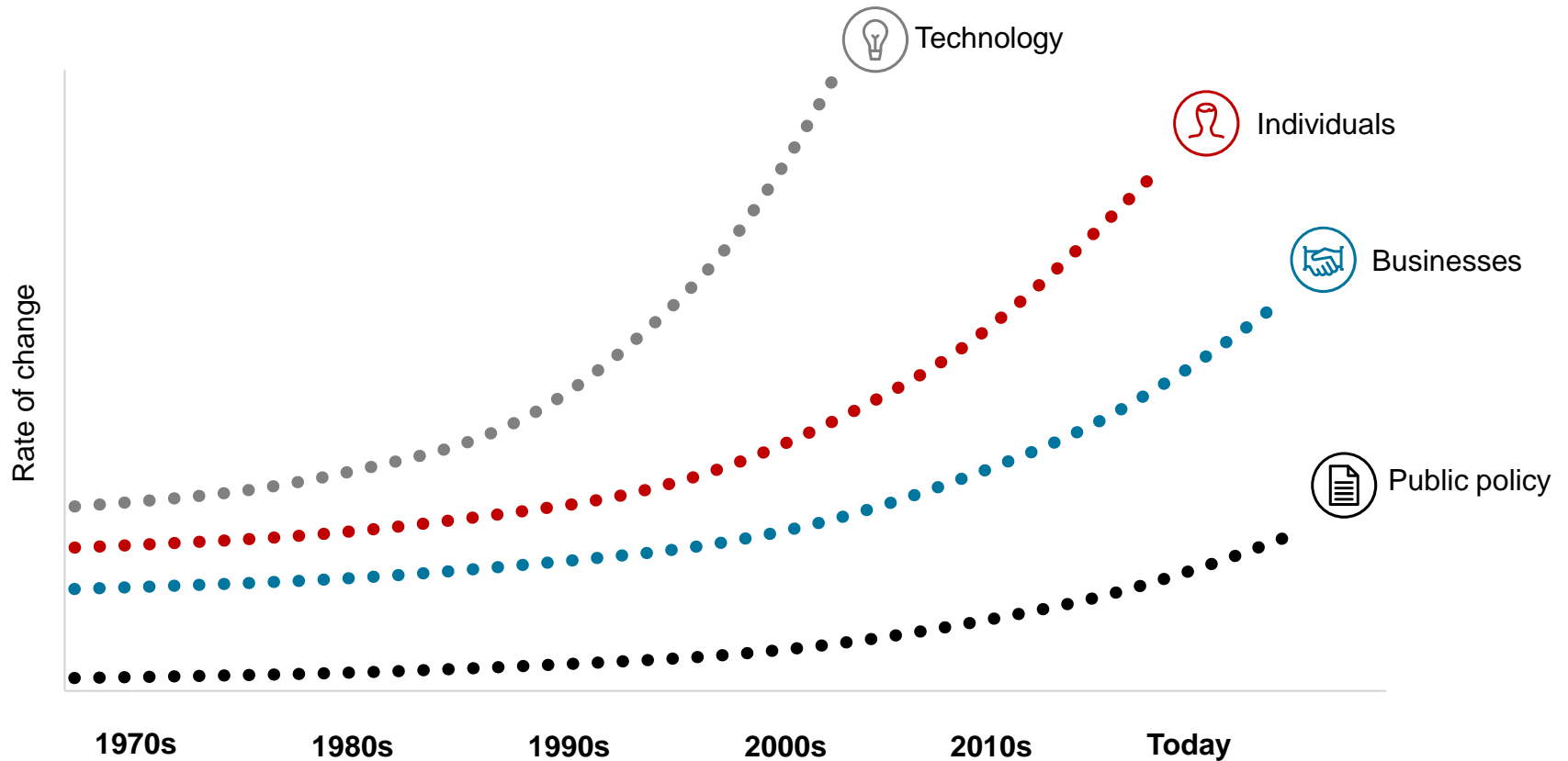
We are on the cusp of “Business 4.0”



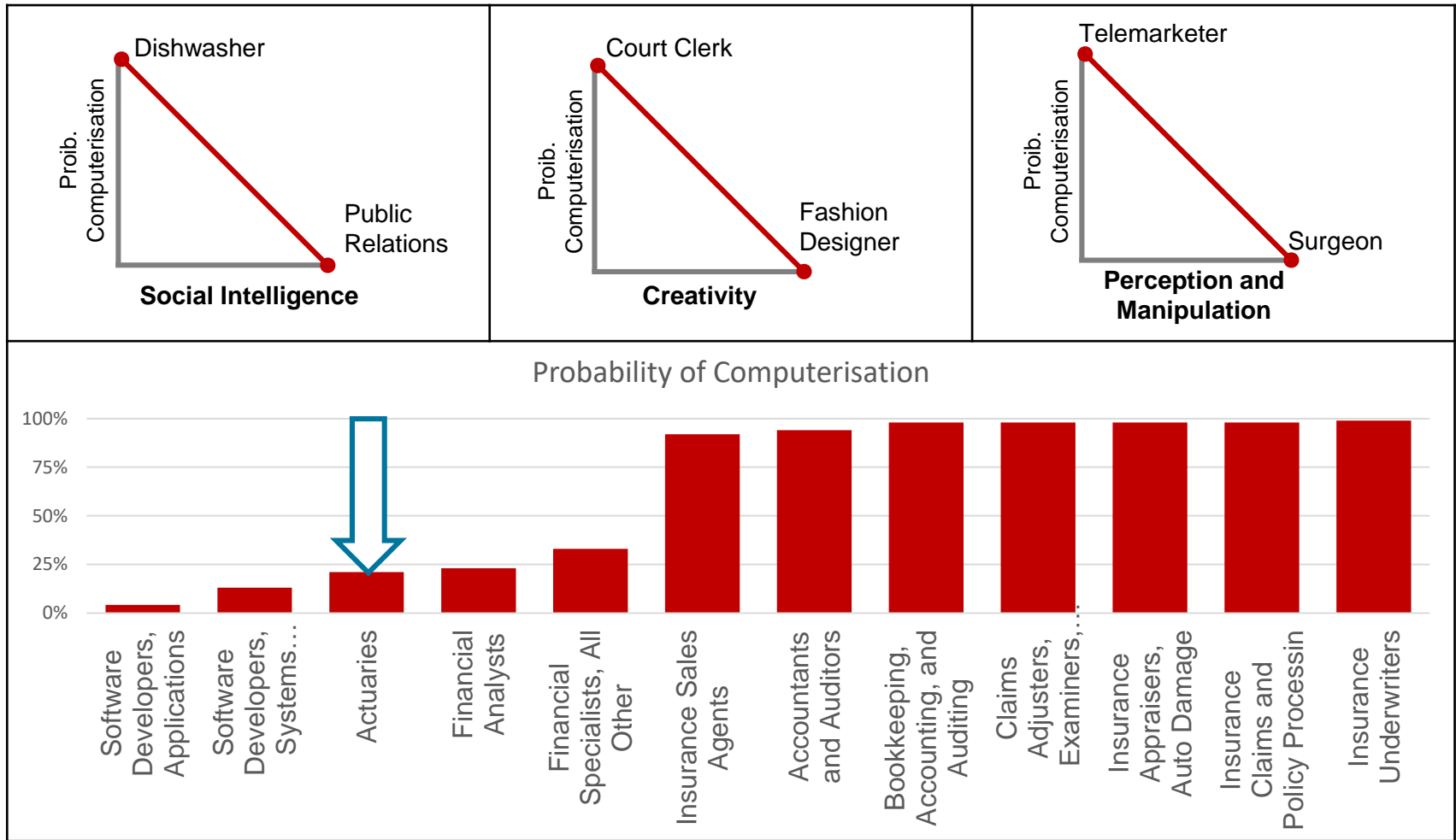
Legend

¹Robotic Process Automation
 Source: Industry 4.0: Challenges and Solutions for the Digital Transformation of Exponential Technologies, Deloitte AG, 2015 and Deloitte proprietary research

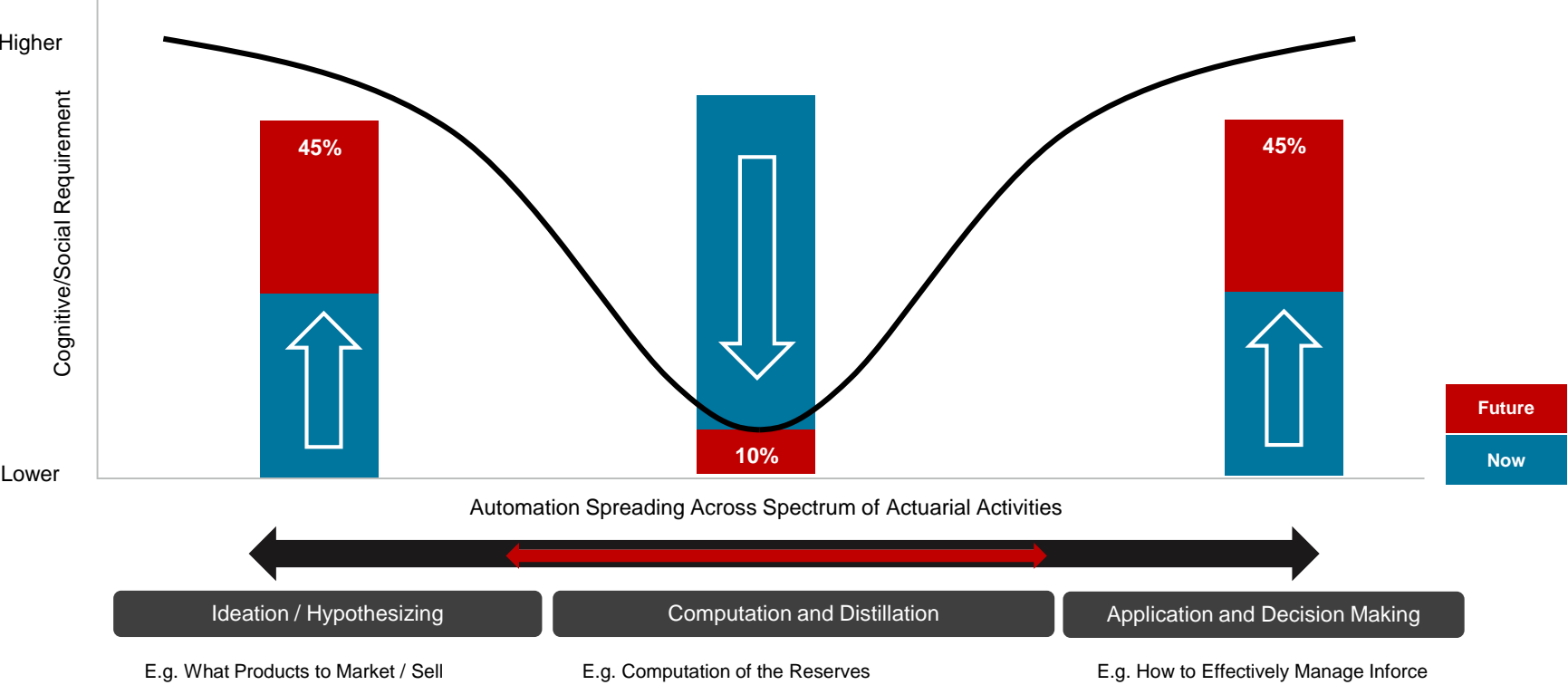
The Rate of Change




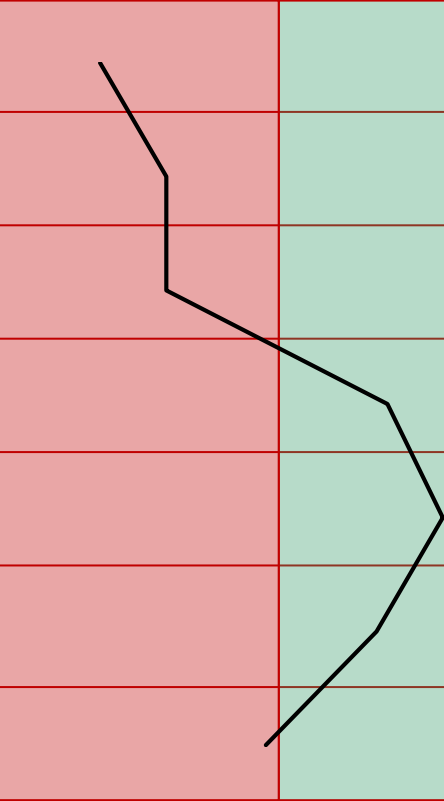
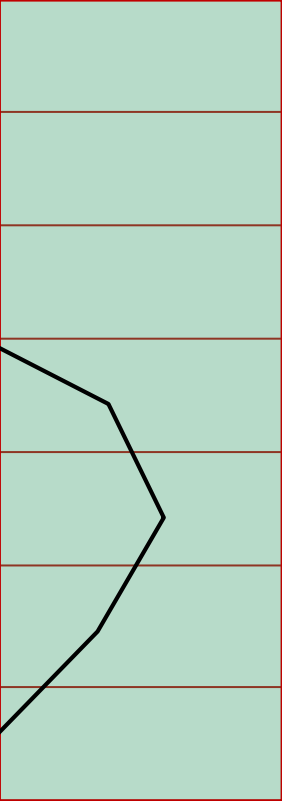






Will the Machines take our Jobs?










How Actuaries will Spend their Time



Time vs Enjoyment Reward

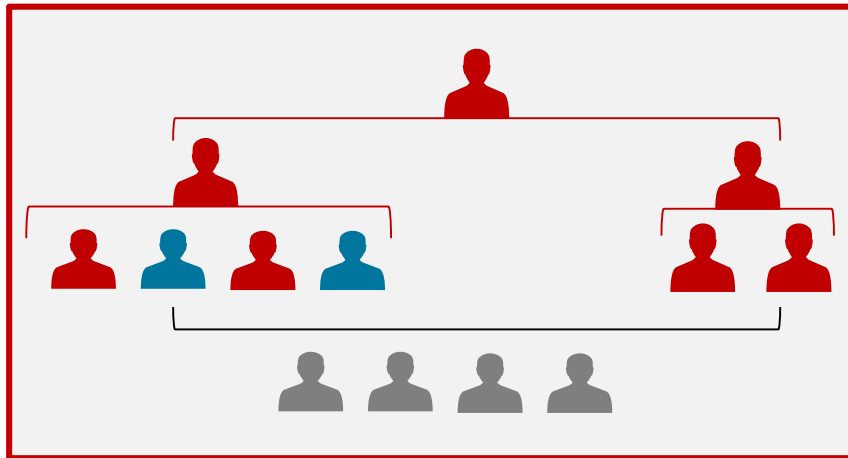
Task	Time	Average Enjoyment	
Data Extraction	 4%		
Data Cleaning	 12%		
Data Transformation	 8%		
Initial Analysis	 10%		
Modelling	 18%		
Initial Result Production & Communication	 6%		
Report Writing	 18%		

Possible Solutions

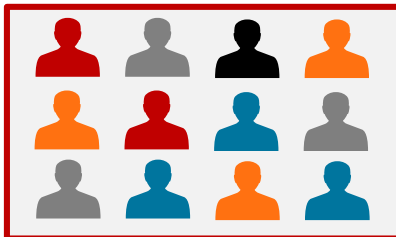
Task	Average Enjoyment		Resources
Data Extraction			
Data Cleaning			
Data Transformation			
Initial Analysis			
Modelling			
Initial Result Production & Communication			
Report Writing			

Team Construction

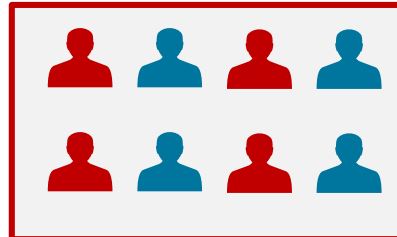
Structure of the Future



Crowd



Consultants



Analytics Team Construction

Analytics Team

		Actuarial Resources	Statisticians / Data Scientists
Advantages		<ul style="list-style-type: none"> • Good business understanding • Better softer skills • Can learn new technical skills 	<ul style="list-style-type: none"> • Less Expensive • Better Technical Knowledge • Larger talent pool
	Disadvantages	<ul style="list-style-type: none"> • More Costly • Scarce at senior levels • Knows enough to be dangerous 	<ul style="list-style-type: none"> • Lack business understanding and practical application • Struggles to learn business skills

Crowdsourcing

Crowdsourcing Model

Crowd
Collaboration

Crowd
Competition

Crowd Labour

Microtasks

Mesotasks

Macrotasks

Benefits






- Access to an array of talent from different backgrounds
- Flexibility: Increase capacity without long term commitments
- Synergies through Collaboration

























Detractions

- No standards across platforms and varying degrees of quality assurance
- Constant management is still needed
- Potential impact on existing workforce

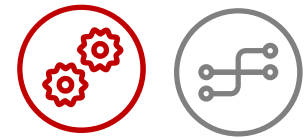
Technological Disruptions

Possible Solutions

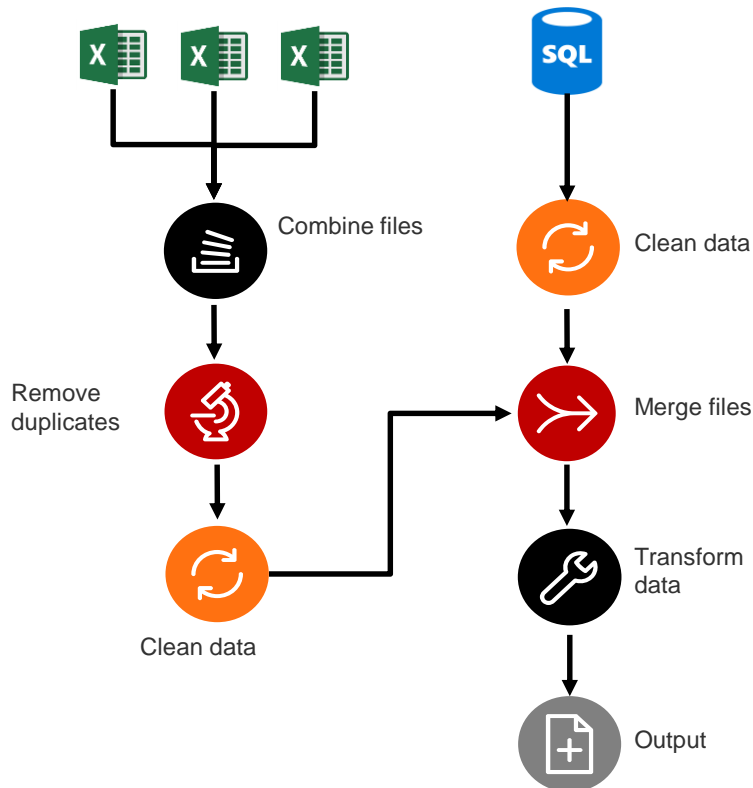
 Alternative Resources
  Crowds
  RPA
  Data Wranglers
  NLP
  NLG
  Machine Learning

Task	Average Enjoyment	Possible Technologies
Data Extraction		    
Data Cleaning		   
Data Transformation		   
Initial Analysis		  
Modelling		  
Initial Result Production & Communication		 
Report Writing		  

Automation: RPA & Data Wranglers



Data Import Process



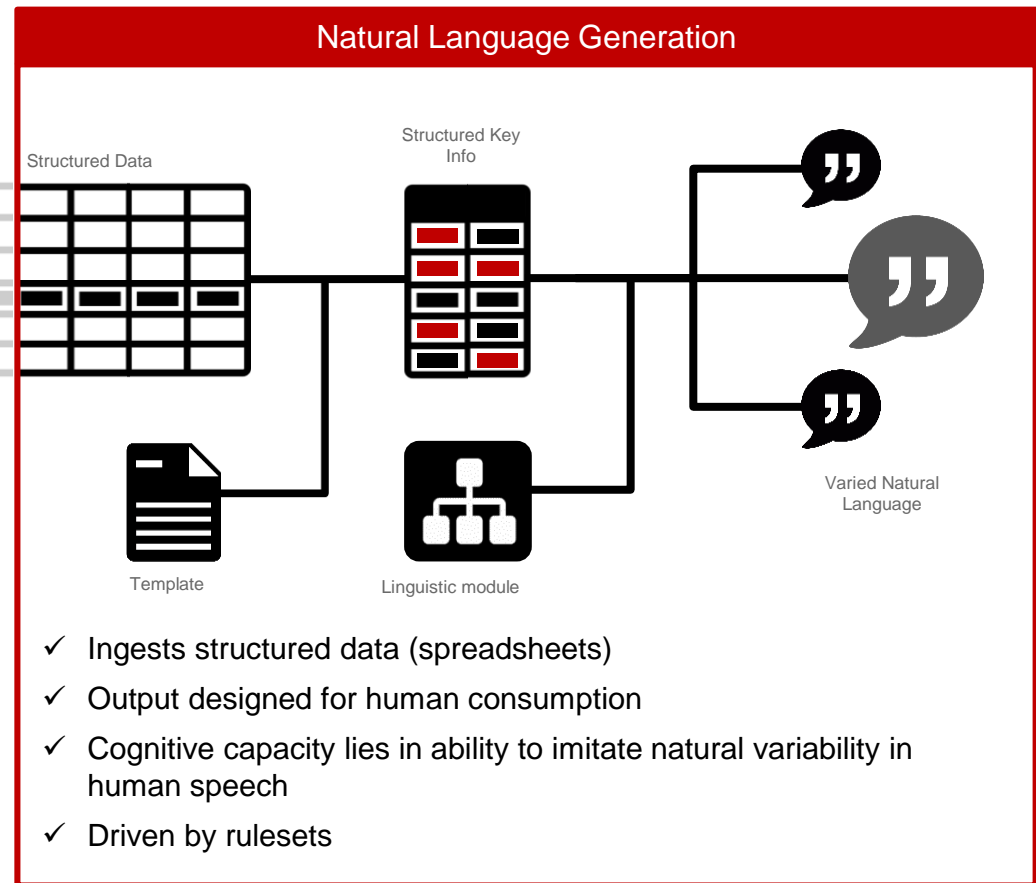
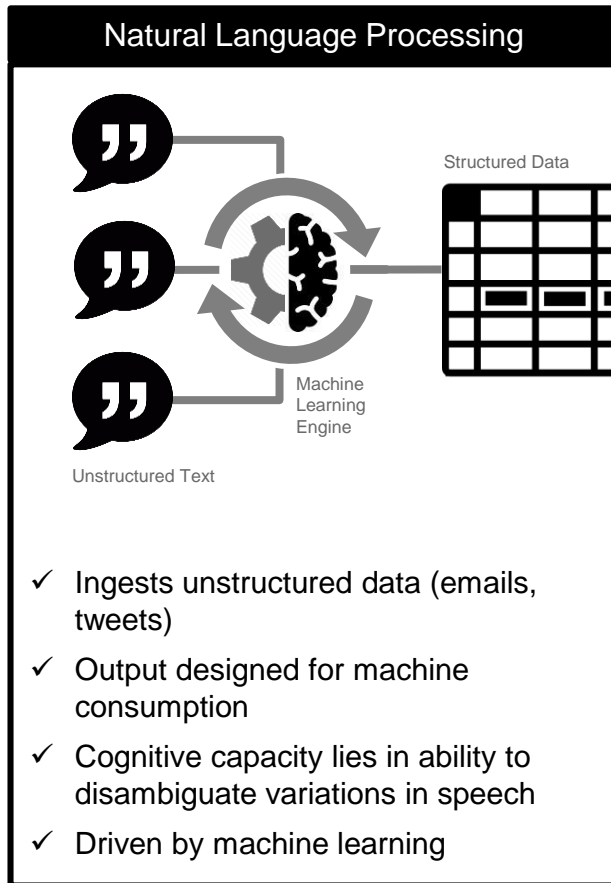
What it can do:

- Run models and programs
- Open emails and attachments
- Move files and folders
- Extract structured data from documents
- Scrape data from the web
- Connect to system APIs
- Collect social media statistics
- Follow “if/then” decisions/rules

What it cannot do:

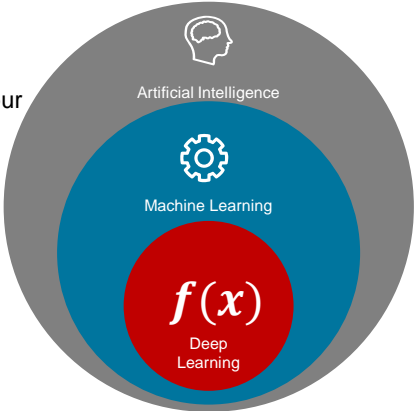
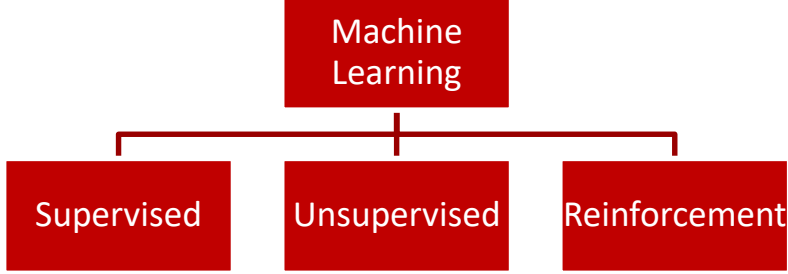
- It won't work with unclearly defined processes
- Handle unstructured data
- Adjust on the fly
- Manage unpredictable processes
- Make judgments and decisions

Natural Language Processing & Generation



Machine Learning



AI Hierarchy		Types of Machine Learning	
<p>Artificial Intelligence: Any technique which enables computers to mimic human behaviour</p> <p>Machine Learning: Subset of AI techniques which use statistical methods to enable machines to improve with experience</p> <p>Deep Learning: Subset of ML which make the composition of multi-layer neural networks feasible</p> 		 <pre> graph TD ML[Machine Learning] --> S[Supervised] ML --> U[Unsupervised] ML --> R[Reinforcement] </pre>	
		<ul style="list-style-type: none"> • Classification • Regression • Forecasting 	<ul style="list-style-type: none"> • Clustering • Dimension reduction
Statistical Model		Machine Learning	
Interpretation	Results need to be interpretable	“Black box” approach	
Signal to Noise Ratio	Low	High	
Number of Variables	Low with limited or no interactions	High with various interactions	
Data	Low volumes needed	High volumes needed	
Results	Uncertainty of the results is important	Uncertainty in results can be ignored	

Getting Started

Think Big



**Immerse Yourself in
Innovation**



**Find Some
Friends**

Start Small



**Assess the
Landscape**



**Pick One or
Two Plays**

Act Fast






**Test if it Works
(Quickly)**



**Market Your
Own Success**

Key Takeaways

-  Things are already changing and our jobs will change
-  Luckily, technological improvements will ***reduce the time we spend on tasks we don't enjoy*** and give us ***new tools to do the tasks we enjoy***
-  ***Think Big, Start Small and Act Fast***

Questions?



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