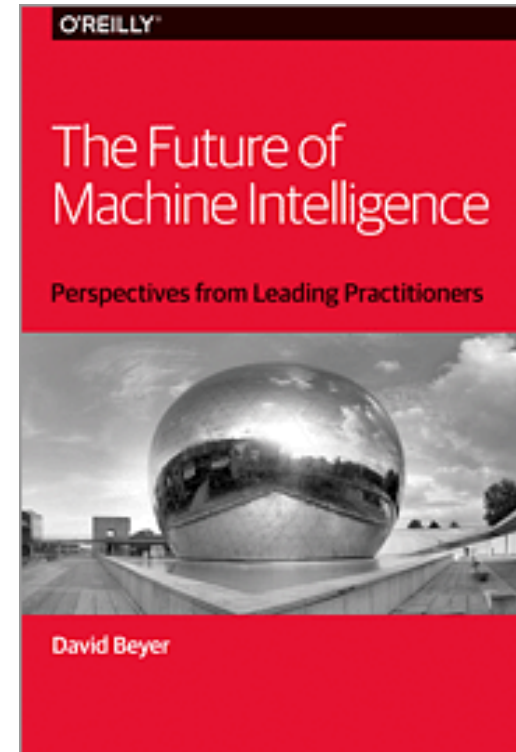




## CHARTIO



# A Dizzying Landscape



## MACHINE INTELLIGENCE 2.0

### AGENTS

PROFESSIONAL	PERSONAL	OS INTERFACES
<b>Howdy!</b> x.ai clara <b>KASIST</b> DigitalGenius <b>OVERLAP.CC</b> meekan <b>fuse</b> machines PRIMER	<b>facebook</b> xiaoice <b>large</b> <b>assistant.ai</b> nestor <b>@wesome</b> Magic	<b>Siri</b> Cortana VIV <b>maluuba</b> api.ai <b>CocNEA</b> Google Now

### AUTONOMOUS SYSTEMS

AIR	GROUND	SEA	INDUSTRIAL
<b>3DR</b> <b>dji</b> PROJECT LOON <b>VERTICAL</b> DroneDeploy <b>AIRDOG</b> SKYCATCH <b>SKYDIO</b> Airware LILY	<b>Google</b> <b>UBER</b> <b>TESLA</b> CRUISE <b>MOBILEYE</b> <b>COMMA</b> AdasWorks	<b>LIQUID ROBOTICS</b> <b>bluefin data</b> <b>OPENROV</b> <b>BluHaptics</b>	<b>KIVA Systems</b> <b>fetch</b> <b>HARVEST</b> <b>CLEARPATH</b> <b>AVIDBOTS</b> <b>ENERGID</b> <b>rethink robotics</b> <b>GREYORANGE</b> <b>OSARO</b>

### ENTERPRISE

SECURITY / FRAUD	HR / RECRUITING	SALES	MARKETING	CUSTOMER SUPPORT	INTERNAL INTEL	MARKET INTEL
<b>Sentinel</b> <b>graphistry</b> <b>BITSIGHT</b> <b>feedzai</b> AREA 1 <b>drawbridge</b> <b>siftscience</b> <b>CYCLANCE</b> <b>Brighterion</b>	<b>textio</b> <b>hiQ</b> <b>gild</b> <b>SpringRole</b> <b>entelo</b> <b>unitive</b> <b>GIGSTER</b>	<b>sense</b> <b>infer</b> <b>people</b> <b>Preact</b> <b>Prism</b> <b>AVISO</b> <b>Vidora</b> <b>sentient</b> <b>salespredict</b> <b>Gainsight</b>	<b>LiftIgniter</b> <b>RADIUS</b> <b>brightfunnel</b> <b>retention</b> <b>AIRPR</b>	<b>CLARABRIDGE</b> <b>QUANTIFIND</b> <b>Wiseio</b> <b>ACTIONIQ</b> <b>FRAMED</b> <b>DigitalGenius</b>	<b>Alation</b> <b>ADATAO</b> <b>Palantir</b> <b>sapho</b> <b>lucid</b> <b>Rainbird</b> <b>SKIPFLAG</b> <b>agolo</b> <b>Digital Reasoning</b> <b>Narrative Science</b>	<b>Quid</b> <b>mattermark</b> <b>DataFox</b> <b>bottlenise</b> <b>PREMISE</b> <b>enigma</b> <b>CB INSIGHTS</b>

### PLATFORMS

RESEARCH / AGI	FULL STACK	MACHINE LEARNING	INDUSTRIAL IOT	AUDIO	VISION	DATA ENRICHMENT
<b>OpenAI</b> <b>vicarious</b> <b>Google DeepMind</b> <b>Numenta</b> <b>Cycorp</b> <b>mnasense</b> <b>SCALED INFERENCE</b> <b>格CURIOUS</b> <b>GEOMETRIC INTELLIGENCE</b>	<b>context relevant</b> <b>CognitiveScale</b> <b>NVIDIA</b> <b>TERADEEP</b> <b>QUALCOMM</b> <b>nervana</b> <b>SYSTEMS</b>	<b>DatOx</b> <b>rapidminer</b> <b>cortical.io</b> <b>AYASDI</b> <b>amazon</b> <b>Azure</b> <b>web services</b> <b>Microsoft</b> <b>narologics</b> <b>PredictionIO</b> <b>SKYTREE</b> <b>bigm</b> <b>blueyonder</b>	<b>ThingWorx</b> <b>UPTAKE</b> <b>IMUBIT</b> <b>Preferred Networks</b> <b>Alluvium</b> <b>xively</b> <b>PLANET OS</b>	<b>Gridspace</b> <b>TalkIQ</b> <b>nexidia</b> <b>vocaliq</b> <b>NUANCE</b> <b>Expect Labs</b> <b>popUP archive</b>	<b>ORBITAL INSIGHT</b> <b>Descartes Labs</b> <b>DEXTRO</b> <b>cortica</b> <b>clarifai</b> <b>PLANET</b> <b>MetaMind</b>	<b>diffbot</b> <b>Paxata</b> <b>TRIFACTA</b> <b>IDIOM</b> <b>WorkFusion</b> <b>loop</b> <b>CrowdFlower</b>

### INDUSTRIES

ADTECH	AGRICULTURE	FOR GOOD	RETAIL FINANCE	LEGAL	MATERIALS & MFG	HEALTHCARE
<b>ROTHEORENT</b> <b>dstillery</b> <b>BEYONDERBAL</b> <b>METAMARKETS</b> <b>TARAD</b> <b>rocketfuel</b> <b>affectiva</b>	<b>BLUEDRIVER</b> <b>tule</b> <b>TerraAvion</b> <b>mavrx</b> <b>THE CLIMATE CORPORATION</b> <b>CERES</b> <b>HONEYCOMB</b>	<b>Conservation Metrics</b> <b>DataKind</b> <b>DATA POP</b> <b>thorn</b> <b>BAYES IMPACT</b>	<b>inVenture</b> <b>affirm</b> <b>earnest</b> <b>MIRADOR</b> <b>Lendo</b> <b>2025 finance</b> <b>LendUp</b>	<b>Everlaw</b> <b>RAVEL</b> <b>LEGAL ROBOT</b> <b>Seal</b> <b>BEAGLE</b> <b>ROSS</b> <b>Lex Machina</b>	<b>zymergen</b> <b>AUGMATE</b> <b>GINKGO</b> <b>BIOWORKS</b> <b>TRINITY</b> <b>SIGHT MACHINE</b> <b>TECHNOLOGIES</b> <b>CALCULARIO</b> <b>Eigen Innovations</b>	<b>deep genomics</b> <b>3SCAN</b> <b>enlithic</b> <b>Calico</b> <b>MULTISPECIES</b> <b>Atomwise</b> <b>Recombine color</b> <b>METABIOTA</b> <b>GRAND ROUNDS</b> <b>Google Life Sciences</b> <b>IBM Watson Health</b>

### INDUSTRIES (CONT'D)

EDUCATION	TRANSPORT & LOGISTICS	INVESTMENT FINANCE	TECH USER TOOLS	MACHINE LEARNING	OPEN SOURCE
<b>KNEWTON</b> <b>coursera</b> <b>turnitin</b> <b>gradescope</b> <b>UDACITY</b> <b>KHANACADEMY</b>	<b>NAUTO</b> <b>taleris</b> <b>PRETECKT</b> <b>clearmetal</b>	<b>Bloomberg</b> <b>Quantopian</b> <b>Dataminr</b> <b>KENSHO</b> <b>ISENTIA</b> <b>NEURENSIC</b> <b>alphasense</b>	<b>DOMINO</b> <b>kaggle</b> <b>Sentana</b> <b>sense</b> <b>yseop</b> <b>Outlier</b> <b>yhat</b> <b>DataRobot</b>	<b>Cortana Analytics</b> <b>AlchemyAPI</b> <b>glowflsh</b> <b>IBM Watson Platform</b> <b>Anodot</b> <b>MonkeyLearn</b> <b>(h[s]) HyperScience</b> <b>fuzzy.io</b> <b>SIGOPT</b> <b>Oxdata H2O</b> <b>SPARKBEYOND</b> <b>indico</b>	<b>SKYMIN</b> <b>TensorFlow</b> <b>seldon</b> <b>Caffe</b> <b>theano</b> <b>Spark MLlib</b> <b>Microsoft</b> <b>spaCy</b> <b>DL4J</b> <b>SciKit</b> <b>CGT</b>

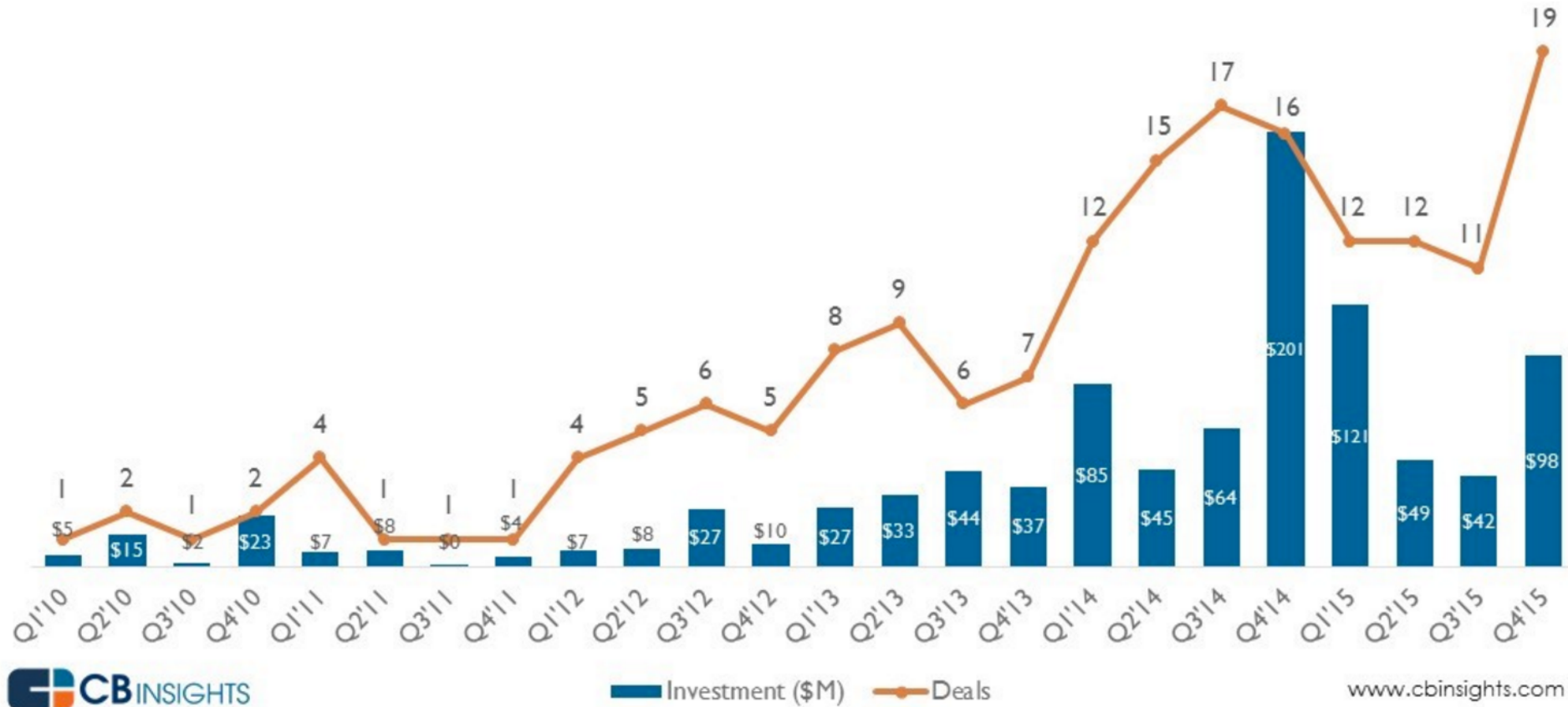
SHIVONZILLIS.COM / MACHINEINTELLIGENCE

Source: Shivon Zillis, Bloomberg Beta

# VCs Ramping Up



## Artificial Intelligence Global Quarterly Financing History 2010 - 2015



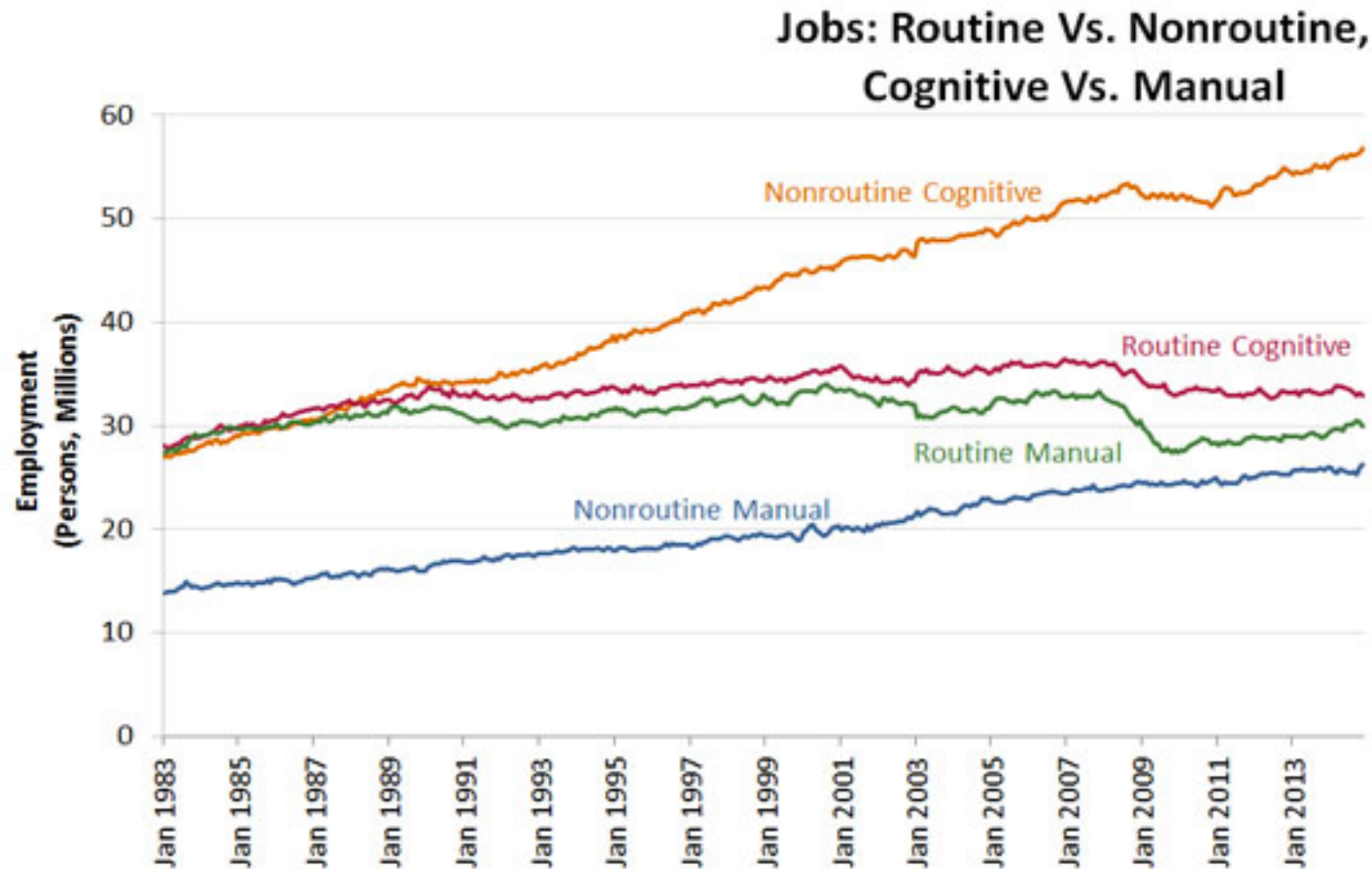
# What is Work Anyway?



	Routine	Non-Routine
<b>Cognitive</b>	Office Assistants Sales Agents	Managers Creatives Engineers Health Care
<b>Manual</b>	Construction Mechanics Assembly Line	Waiters Security

*Source: Autor, et al*

# From the IT Revolution to Something New?



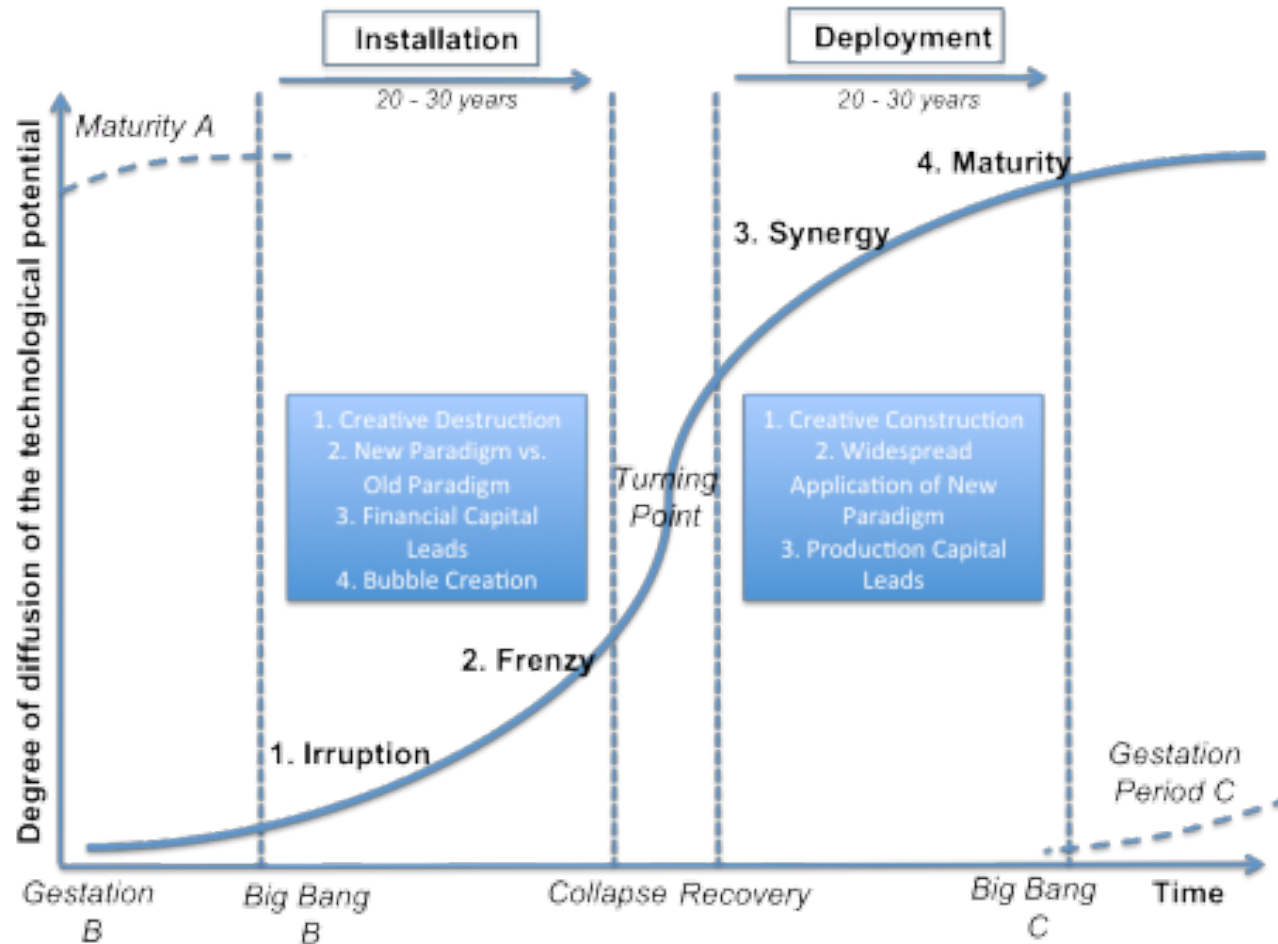
SOURCE: Current Population Survey and author's calculations.

FEDERAL RESERVE BANK of ST. LOUIS

# The Age of Machine Learning is upon Us

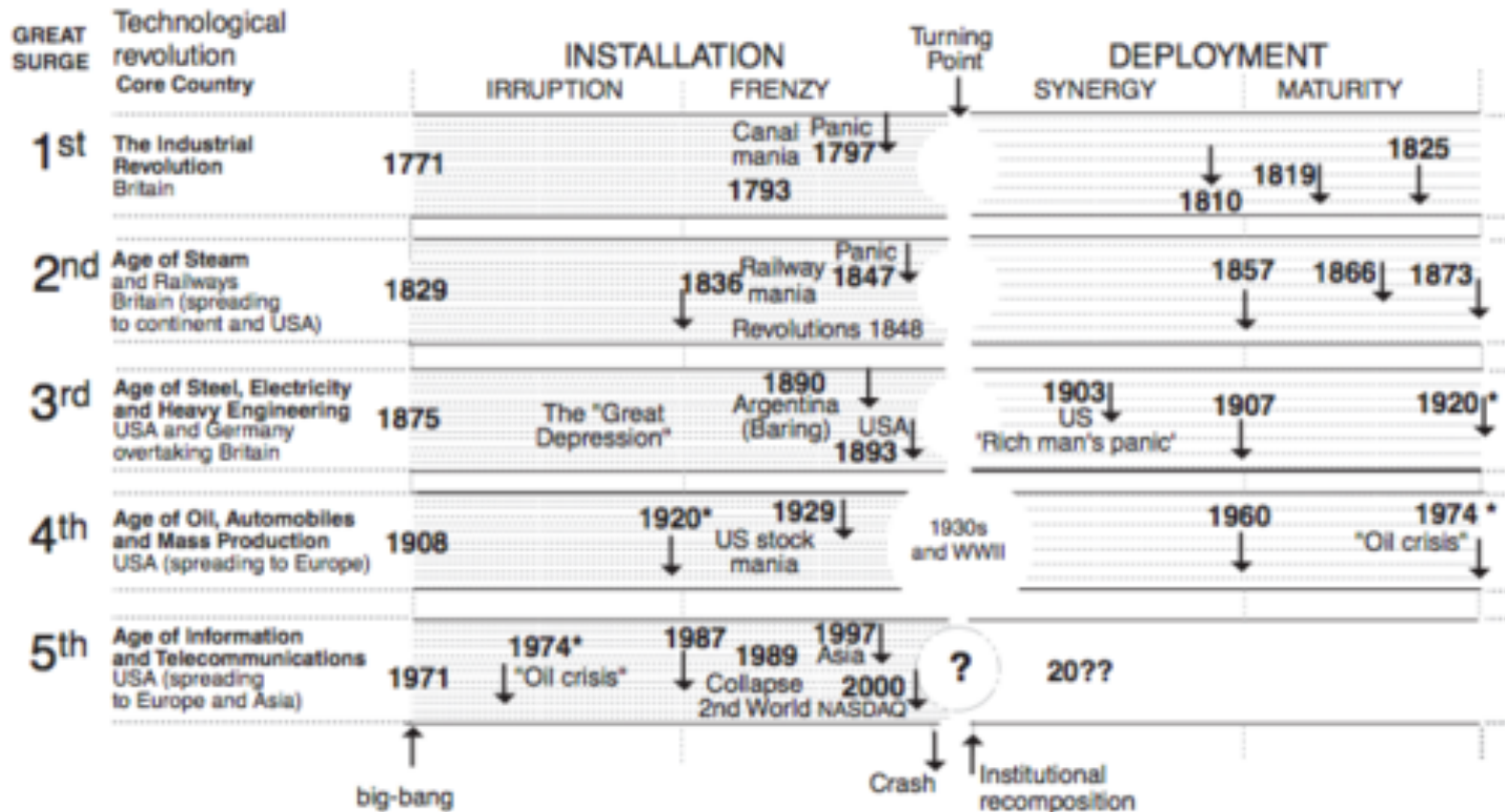


## Perez Technological Surge Cycle



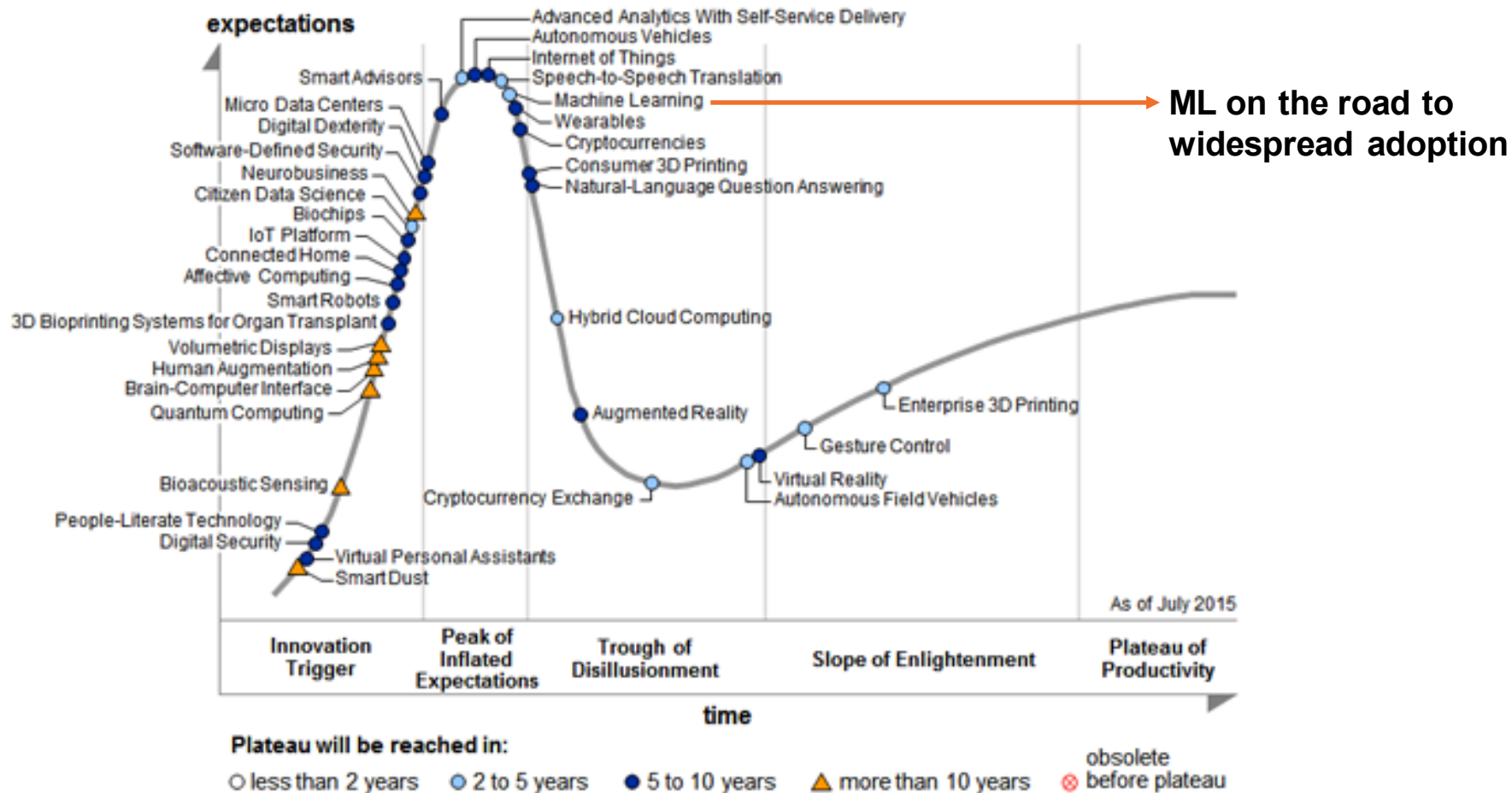
Source: [avc.com](http://avc.com)

# The Historical Context for Machine Learning



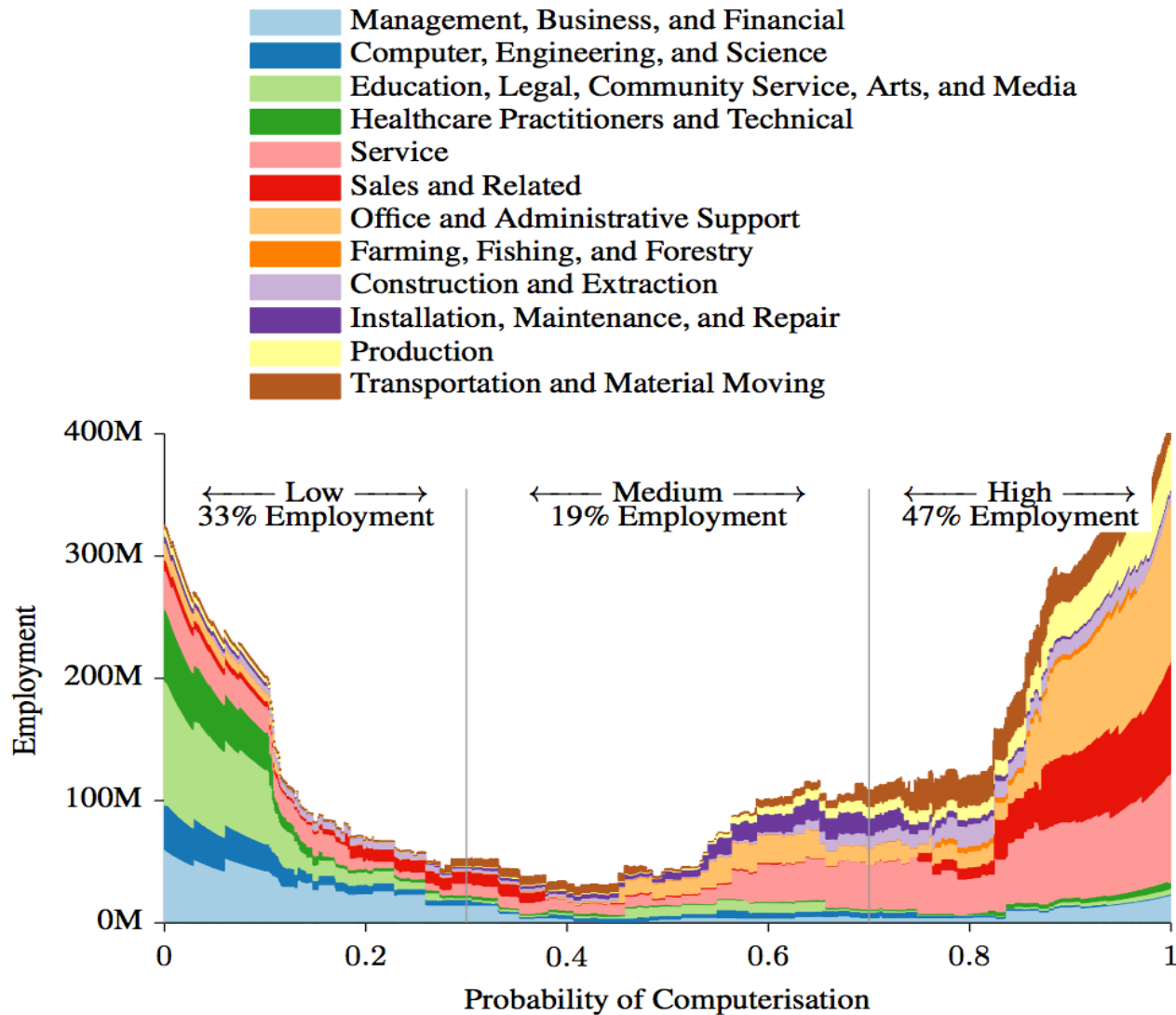
Source: *Technological Revolutions and Financial Capital*

# Enterprise Adoption Moving Fast (Sort of)



Source: Gartner

# Automation Risk



Source: Osborne et al



## High Risk

Accommodation/Food Services (86%)

Transportation/Warehousing (75%)

Real Estate (67%)

Wholesale Trade (66%)

Administration (65%)

Manufacturing Construction (62%)

## Low Risk

Information (10%)

Management (11%)

Forestry/Hunting (12%)

Education (17%)

Government (23%)

Utilities (31%)

Professional science (35%)

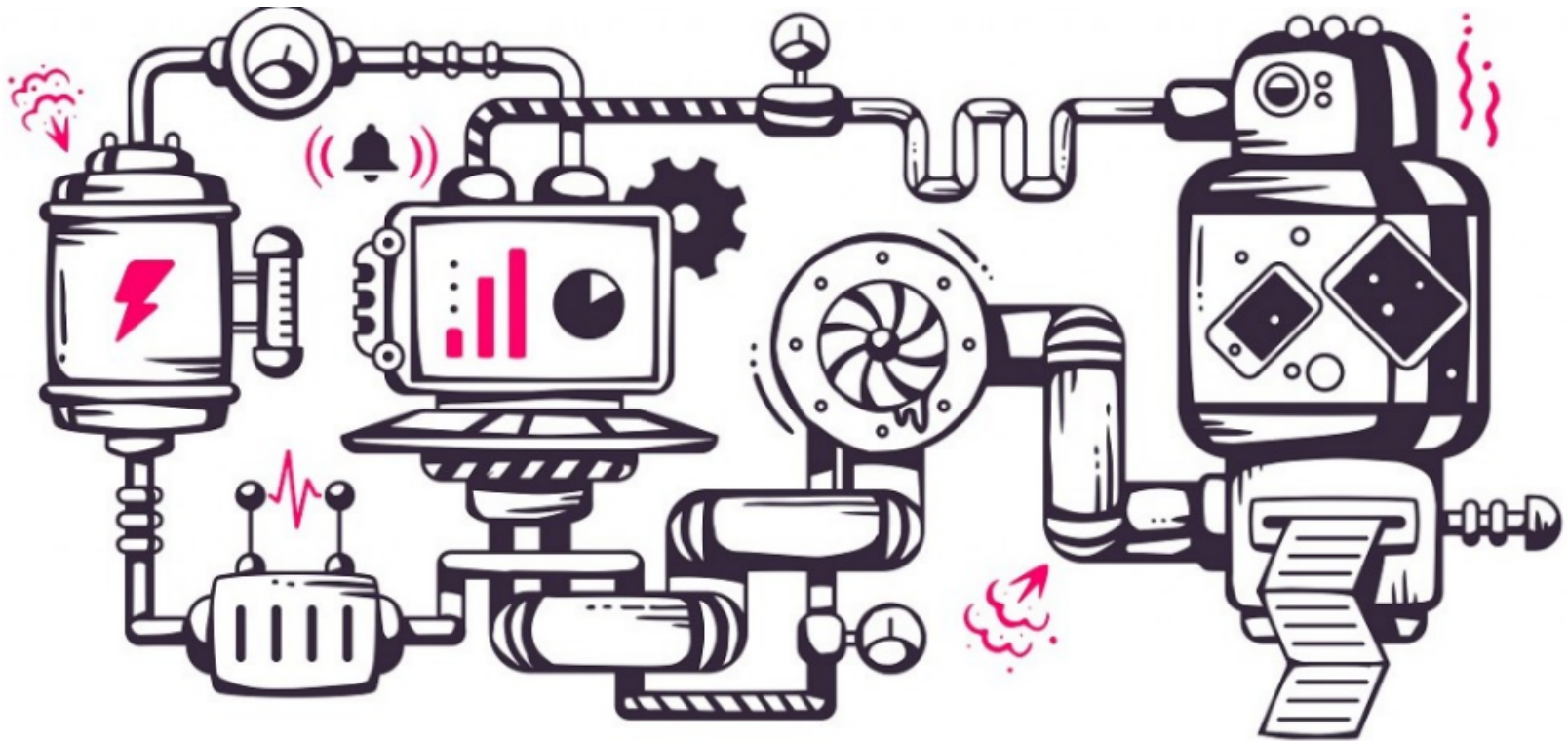
# The Final Frontier?



Computerisation bottleneck	O*NET Variable	O*NET Description
Perception and Manipulation	Finger Dexterity	The ability to make precisely coordinated movements of the fingers of one or both hands to grasp, manipulate, or assemble very small objects.
	Manual Dexterity	The ability to quickly move your hand, your hand together with your arm, or your two hands to grasp, manipulate, or assemble objects.
	Cramped Work Space, Awkward Positions	How often does this job require working in cramped work spaces that requires getting into awkward positions?
Creative Intelligence	Originality	The ability to come up with unusual or clever ideas about a given topic or situation, or to develop creative ways to solve a problem.
	Fine Arts	Knowledge of theory and techniques required to compose, produce, and perform works of music, dance, visual arts, drama, and sculpture.
Social Intelligence	Social Perceptiveness	Being aware of others' reactions and understanding why they react as they do.
	Negotiation	Bringing others together and trying to reconcile differences.
	Persuasion	Persuading others to change their minds or behavior.
	Assisting and Caring for Others	Providing personal assistance, medical attention, emotional support, or other personal care to others such as coworkers, customers, or patients.

Source: Osborne et al

# Re-structura-bility



# A Startup Taxonomy



Panopticons



Lasers



Alchemists



Gateways



Agents



Magic Wand



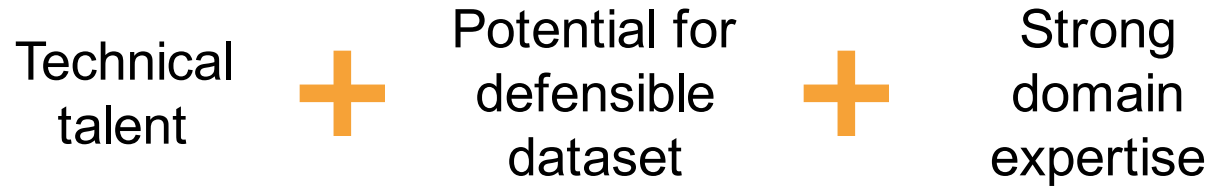
Navigator



Pioneer



Source: <http://techcrunch.com/2015/11/26/machine-intelligence-in-the-real-world/>



## Other considerations:

- Tackling a well-defined problem
- Data assets from go-to-market accrue to adjacencies
- Time to value shortens at scale

# Giants among Us



# Exciting Opportunities across the Board



Health Care



Oil & Gas



Transportation



Agriculture



Legal

