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Corso ITS VII Ciclo

"Tecnico superiore per il Marketing dei Prodotti Agroalimentari"

(Acronimo: TE.M.PR.A)

Docente: Antonio Messeni Petruzzelli

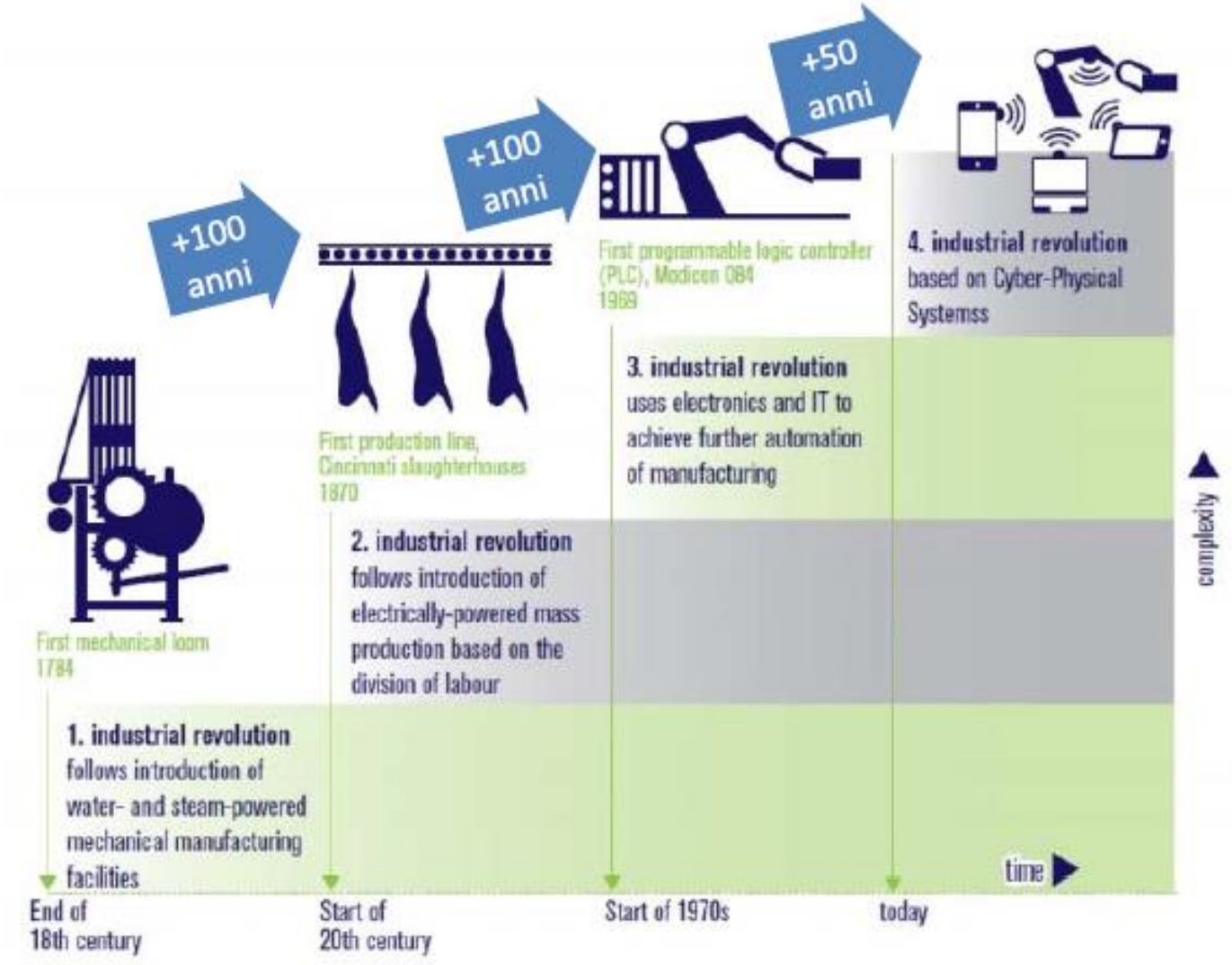
AREA: Industria 4.0 – Opportunità e Sfide

UF: Industria Agroalimentare 4.0

Rivoluzione Industriale?

Cambiamento (pervasivo e) radicale
dei modelli di produzione e consumo
che determina un cambiamento profondo della società

Le 4 Rivoluzioni Industriali



Perché I4.0: Cos'è?

Il termine Industria 4.0 (o Industry 4.0) indica una tendenza della trasformazione industriale in ottica digitale al fine di migliore il modello di produzione, la gestione aziendale e l'intero modello di business

Perché I4.0?

Alcune cifre sul settore industriale
(al netto di *mining*, *construction*, *energy*)

2 mln di imprese (10%) e 33 mln di persone

Oltre 80% di export

80% di ricerca privata e innovazione

1 lavoro → da 1,5 a 2 lavori in altri settori

Trend e prospettive

Quota valore aggiunto in calo (15,3% nel 2014): concorrenza esterna (Cina) e crescita % dei servizi

Target EU 2020 (definito nel 2012): 20% (grazie a Industry 4.0)

Industry 4.0 (2011)

Industry 4.0 è la trasformazione globale di tutta la produzione industriale attraverso la convergenza fra tecnologia digitale e Internet con l'industria convenzionale

Tutte le entità relative alla produzione (fornitori, stabilimento, distributori, persino lo stesso prodotto) sono fra loro digitalmente connesse →

→ Integrazione elevata della *value chain*

Altre denominazioni o concetti collegati

- Smart factories
- The Industrial Internet of Things
- Smart industry
- Advanced manufacturing
- …

Connessione digitale delle entità di produzione?
Persone e oggetti hanno un entità corrispondente nel mondo virtuale e ciascuna entità è potenzialmente connessa con ogni altra.

Industry 4.0 – Un Focus Italiano

Produzione in cui è crescente la connessione tra mondo virtuale (software) e mondo reale (prodotti e produzione) – IoT

grazie a

- Sensori e attuatori piccoli, poco costosi, con consumi ridotti
- Connessioni a internet (anche wireless) a basso costo e ubique
- Disponibilità di indirizzi in rete in numero ~ illimitato

La connessione tra oggetti genera un'enorme massa di dati (big data)

utili per

- Aumentare l'efficienza dei processi
- Conoscere l'utilizzo dei prodotti
- Progettare nuovi servizi

In una ricerca su google la domanda porta a galla la risposta che è già nel web.
Allo stesso modo è il modello che estrae la risposta dai big data!
FARE LA DOMANDA GIUSTA!

Tecnologie I4.0 per l'UE

ICT - Integrazione sistemi nel ciclo di vita del prodotto (produzione e uso) e lungo la supply chain

Cyber-physical systems - Sensori incorporati, robot intelligenti e autoconfigurabili, manufacturing additivo, ...

Network communications (IoT) - Wireless e internet (IoT, ...) per connettere macchine, manufatti, sistemi e persone lungo la supply chain

Simulazione (modellazione e virtualizzazione) a supporto della progettazione di prodotti e processi

Big data, data analitics, cloud computing – Utilizzo in produzione o fasi successive

Realtà aumentata (e tool intelligenti) a supporto degli operatori

Tecnologie I4.0 per il MISE

1 Advanced Manufact. Solutions	• Robot collaborativi interconnessi e rapidamente programmabili
2 Additive Manufacturing	• Stampanti in 3D connesse a software di sviluppo digitali
3 Augmented Reality	• Realtà aumentata a supporto dei processi produttivi
4 Simulation	• Simulazione tra macchine interconnesse per ottimizzare i processi
5 Horizontal/ Vertical Integration	• Integrazione informazioni lungo la catena del valore dal fornitore al consumatore
6 Industrial Internet	• Comunicazione multidirezionale tra processi produttivi e prodotti
7 Cloud	• Gestione di elevate quantità di dati su sistemi aperti
8 Cyber-security	• Sicurezza durante le operazioni in rete e su sistemi aperti
9 Big Data and Analytics	• Analisi di un' ampia base dati per ottimizzare prodotti e processi produttivi

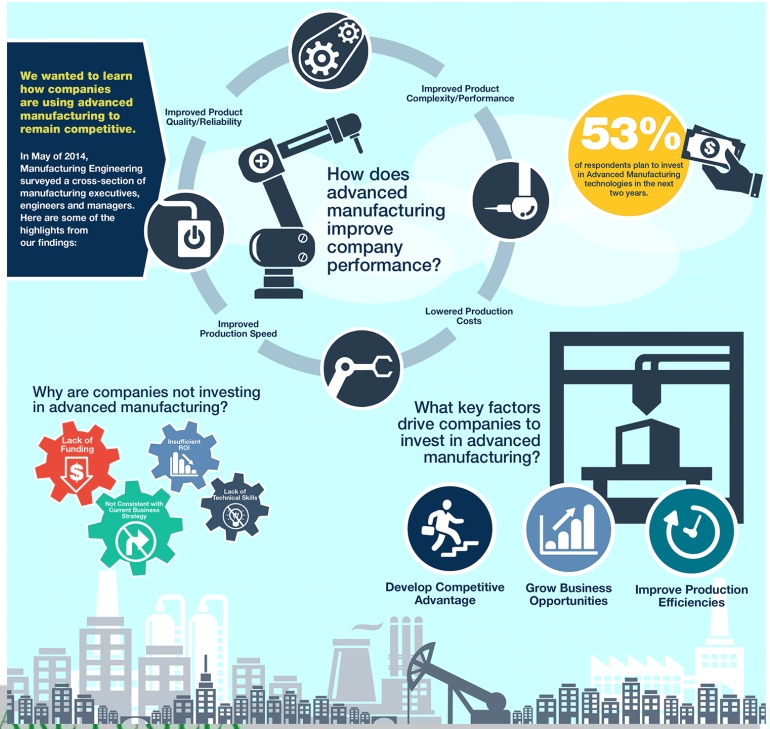
Neutralità tecnologica

Attenzione alla «libidine tecnologica»! Prima la strategia (goal e use case)!

Advanced Manufacturing

Definizione

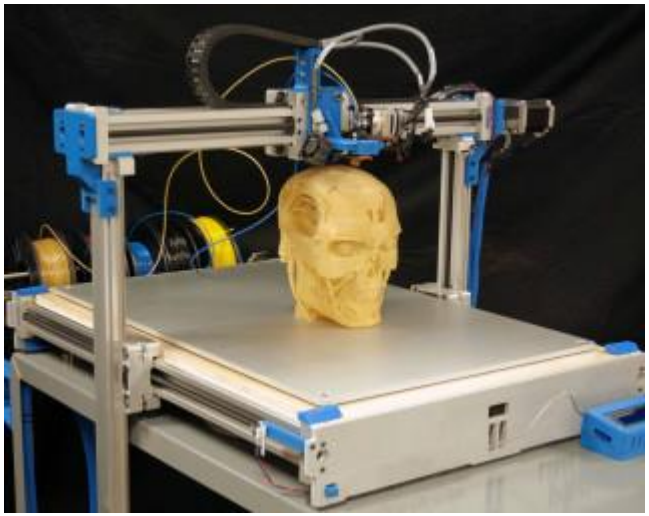
Sistemi avanzati di produzione, ovvero sistemi interconnessi e modulari che permettono flessibilità e performance. In queste tecnologie rientrano i sistemi di movimentazione dei materiali automatici e la robotica avanzata, che oggi entra sul mercato con i robot collaborativi



Additive Manufacturing

Definizione

L’insieme di tutte le tecnologie, dei processi produttivi e di fabbricazione additiva che partono da modelli digitali. L’utilizzo delle stampanti 3D per la prototipazione è il principale esempio di tecnologia additiva. Si parte da un modello CAD 3D che viene suddiviso in strati da un sistema integrato (o online) nella stampante o nella macchina che deposita il materiali secondo la stratificazione definita per fabbricare il prodotto



Augmented Rality

Definizione

Per realtà aumentata (o "AR"), si intende l'arricchimento della percezione sensoriale umana mediante informazioni, in genere manipolate e convogliate elettronicamente, che non sarebbero percepibili con i cinque sensi

Il cruscotto dell'automobile, l'esplorazione della città puntando lo smartphone o la chirurgia robotica a distanza sono tutti esempi di realtà aumentata

Simulation

Definizione

La simulazione numerica è uno strumento sperimentale di analisi, utilizzato in vari ambiti scientifici e tecnologici, grazie al quale è possibile superare le difficoltà o le impossibilità che si affrontano in un laboratorio reale. Questa tecnologia è, quindi, assimilabile, ad una sorta di laboratorio virtuale che consente anche un abbattimento dei costi di studio rispetto ad esperimenti complessi realizzati in laboratorio reale. In fase di progettazione vengono già utilizzate simulazioni 3-D di prodotti, materiali e processi produttivi

- **Tecnologie di simulazione a supporto delle decisioni**:
  - *DSS* (*Decision Support System*): la funzionalità dominante è fornita dall'utilizzo di modelli matematici e analitici che consentono di simulare il comportamento (per esempio, la dinamica temporale) di un sistema sottoposto a differenti opzioni di gestione, e di calcolare gli indicatori per la valutazione quantitativa dei criteri (analisi multicriterio).
- **Tecnologie di simulazione a supporto della progettazione e ingegnerizzazione dei prodotti:**
  - *MBS Simulation* (Modellazione MultiCorpo o Multibody simulation)
  - *BEM Simulation* (Modellazione degli elementi al contorno)
  - *SEA Simulation* (*Statistical energy analysis*)
  - *CFD Simulation* (Analisi fluidodinamiche numeriche)
  - *FEM Simulation* (*Finite Element Method*)
- **Tecnologie di simulazione a supporto dell'analisi dei processi dell'industria manifatturiera e di processo:**
  - *CAM* (*Computer Aided Manufacturing*)
  - *CAPP* (*Computer Aided Process Planning*)
  - *Virtual Commissioning*

Horizontal/Vertical Integration

Definizione

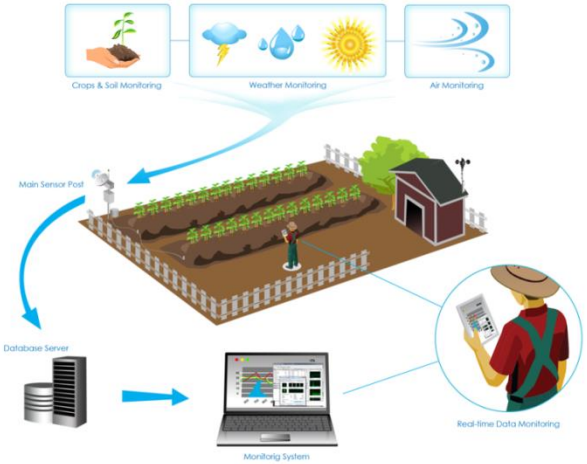
La vertical integration riguarda i processi di ottimizzazione della logistica e produzione. Se le procedure di produzione nel sistema ERP e nel controllo macchine in stabilimento erano finora aree divise tra loro e spesso distribuite tra diversi sistemi IT, nell'integrated industry i processi informatici e di comando vengono sempre più spesso messi in rete ed eseguiti in modo integrato. In tal modo, tutti i reparti aziendali hanno accesso ai dati di produzione e logistici. L'effetto: una horizontal integration nell'intera azienda. Risulta, quindi, sempre più opportuno poter rilevare e tracciare un prodotto e il suo ciclo di vita con tutti i dati pertinenti (conformità alle specifiche, presenza di difetti di cui identificare le cause, tempi di evasione degli ordini)

BLOCKCHAIN

Industrial Internet

Definizione

Comunicazione tra elementi della produzione, non solo all’interno dell'azienda, ma anche all’esterno grazie all'utilizzo di interne – Industrial Internet of Things (IIoT)



Cloud

Definizione

In informatica con il termine inglese cloud computing si indica un paradigma di erogazione di risorse informatiche, come l'archiviazione, l'elaborazione o la trasmissione di dati, caratterizzato dalla disponibilità on demand attraverso Internet a partire da un insieme di risorse preesistenti e configurabili

Cloud computing

Cyber-security

Definizione

Con il termine sicurezza informatica si intende quel ramo dell'informatica che si occupa delle analisi delle minacce, delle vulnerabilità e del rischio associato agli asset informatici, al fine di proteggerli da possibili attacchi (interni o esterni) che potrebbero provocare danni diretti o indiretti di impatto superiore ad una determinata soglia di tollerabilità (es. economico, politico-sociale, reputazionale, ecc...) ad una organizzazione aziendale

1. Broker della sicurezza per l'accesso al cloud

La visibilità limitata sulle capacità di sicurezza dei provider di cloud esterni è da tempo fonte di preoccupazioni, ma ora è possibile riacquisire il controllo della sicurezza del cloud utilizzando un broker della sicurezza per l'accesso al cloud (CASB). Questo software si colloca fra il provider e il consumatore di cloud, offrendo una serie di funzionalità per la sicurezza aziendale, come ad esempio autenticazione, crittografia, rilevamento di malware, audit e gestione dei dispositivi.

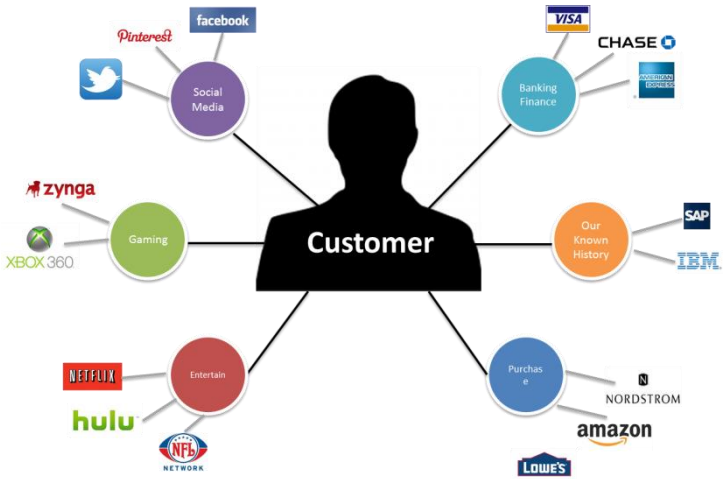
2. Controllo adattivo degli accessi

Se il direttore finanziario è in vacanza in Spagna e desidera controllare le finanze a bordo piscina dall'hotel, un sistema di controllo adattivo degli accessi può essere utile. Questo rileverà la posizione dell'utente ed effettuerà un duplice controllo dell'identità mediante la richiesta di ulteriori informazioni di autenticazione, come ad esempio un codice PIN. Tale approccio alla sicurezza sensibile al contesto permette agli utenti di accedere ai loro dati da qualsiasi dispositivo e luogo, garantendo la sicurezza qualora la password primaria cada nelle mani sbagliate.

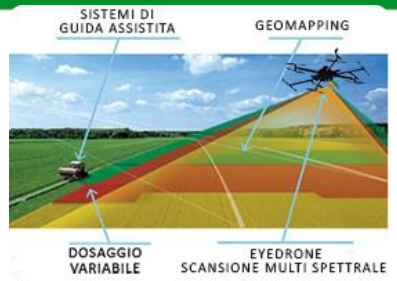
Big Data

Definizione

Descrive una raccolta di dati eterogenei, strutturati e non strutturati, definita in termini di volume, velocità, varietà e veridicità



I4.0 & Agroalimentare



PORCO VINO
www.porcovino.com

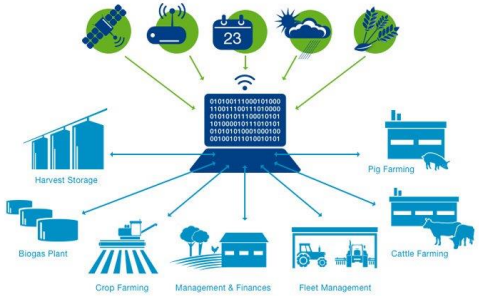
AGRI OPEN DATA

Smart Agri-Food

EZ Lab

kØrto

DIGITAL FARMING



The farm of the future is completely connected:
Satellites and ground-based sensors deliver detailed information on crop conditions. Combined with weather forecasts and histories, crop variety and crop cultivation databases and even work schedules, the farmer obtains a solid foundation on which to make his important everyday agronomic decisions. He also receives live alerts from every corner of his business, be it the cowshed, the combine harvester, the silo or his finance institute.

Sfide Principali

Stimati 140 mld/anno in Europa sino al 2020 (problema soprattutto per le PMI)

Es. riluttanza produttori *automotive* a condividere i dati generati dalle loro auto

Nel 2020 si stima possano mancare in area UE 825.000 professionisti ICT

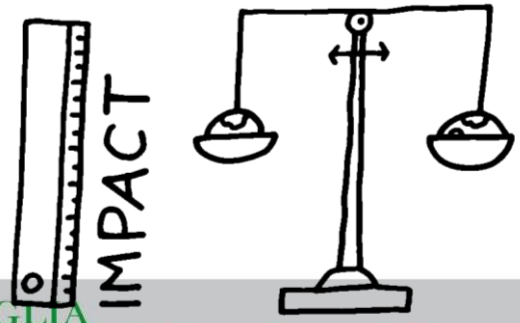
- Contorni sfumati del concetto e aspettative elevate
- Necessità di cooperazione e condivisione di dati (con fornitori, clienti, fornitori dell'infrastruttura)
- Elevata dimensione degli investimenti
- Proprietà e sicurezza dei dati
- Definizione e condivisione di standard
- Competenze del personale

Benefici Principali

Flessibilità	**Maggiore flessibilità** attraverso la produzione di piccoli lotti ai costi della grande scala
Velocità	**Maggiore velocità** dal prototipo alla produzione in serie attraverso tecnologie innovative
Produttività	**Maggiore produttività** attraverso minori tempi di set-up, riduzione errori e fermi macchina
Qualità	**Migliore qualità** e minori scarti mediante sensori che monitorano la produzione in tempo reale
Competitività Prodotto	**Maggiore competitività** del prodotto grazie a maggiori funzionalità derivanti dall'Internet delle cose

E l'Impatto Sociale?

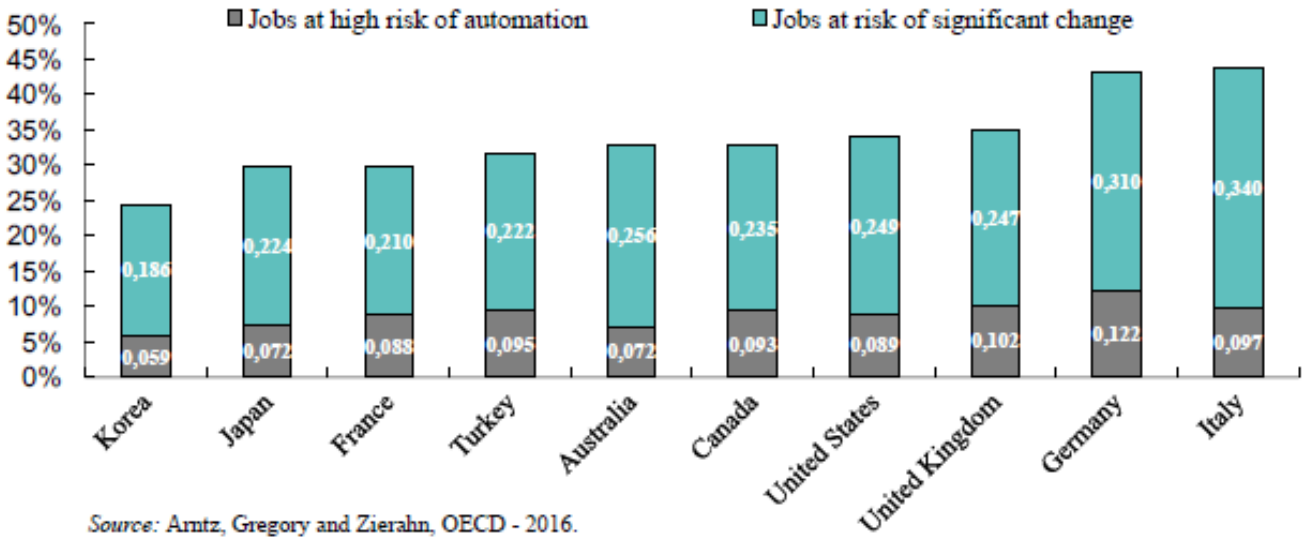
- Distruzione ma creazione di posti di lavoro: nel periodo 1995-2010 in Francia Internet ne ha cancellati 500.000, ma creati 1.200.000
- Per il prossimo futuro è a rischio circa il 54% della forza lavoro nell'UE a 28
  - Il tema non riguarda solo i colletti blu! L'automazione è ora possibile anche per compiti che richiedevano ragionamento o capacità di reagire a situazioni impreviste
- Sta esplodendo la necessità per skills nuove e ad elevata specializzazione (es. big data analytics, cyber-security, cloud computing)
- Le sfide possono essere troppo impegnative, specialmente per le imprese più piccole



I4.0 e Mercato del Lavoro

9% of jobs are at high risk of automation in G20 countries

However, many jobs are likely to experience significant change



Source: Arntz, Gregory and Zierahn, OECD - 2016.

Nuove Professionalità…

1. 3D Printing Engineers

2. Data Protection Managers

3. Augmented Reality Architects

4. Robot Polishers

5. Robot Technicians

6. Home Automation Contractor

7. Cyber Security Specialist

8. Personal Aide

9. Data Analyst

10. Software Developer

11. Market Research Analyst

12. Personal Branding Consultant

I4.0 nel Mondo – Principali Programmi

Stati Uniti d'America
Manufacturing USA

Network di istituti e di lab di eccellenza, per la diffusione tecnologica e delle competenze, costituiti da **grandi gruppi privati ICT** e università, promosso dal Governo e finanziato tramite partnership pubblico-private

Impegno pubblico **~ 0,5 $ Mld**, principali manovre:
- Supporto pubblico a progetti di ricerca

Francia
Industrie du Futur

Piano di reindustrializzazione e di investimento in tecnologie I4.0 guidato centralmente dal **Governo**
Impegno pubblico **> 10 € Mld**, principali manovre:
- Incentivi fiscali per investimenti privati
- Prestiti agevolati per PMI e per le mid-tier
- Credito d'imposta per la ricerca
- Finanziamento progetti "Industrie du Futur" e "Invest for the future"

Germania
Industrie 4.0

Piano d'azione sponsorizzato a livello federale con il coinvolgimento di **grandi player industriali e tecnologici**

Impegno pubblico **~ 1 € Mld**, principali manovre:
- Finanziamento di progettualità aziendali e centri di ricerca applicata
- Agevolazioni fiscali per investimenti in start-up tecnologiche[1]

I4.0 nel Mondo

McKinsey &Company

Survey di McKinsey, 2a edizione – gennaio 2016

- 1a edizione a gennaio 2015

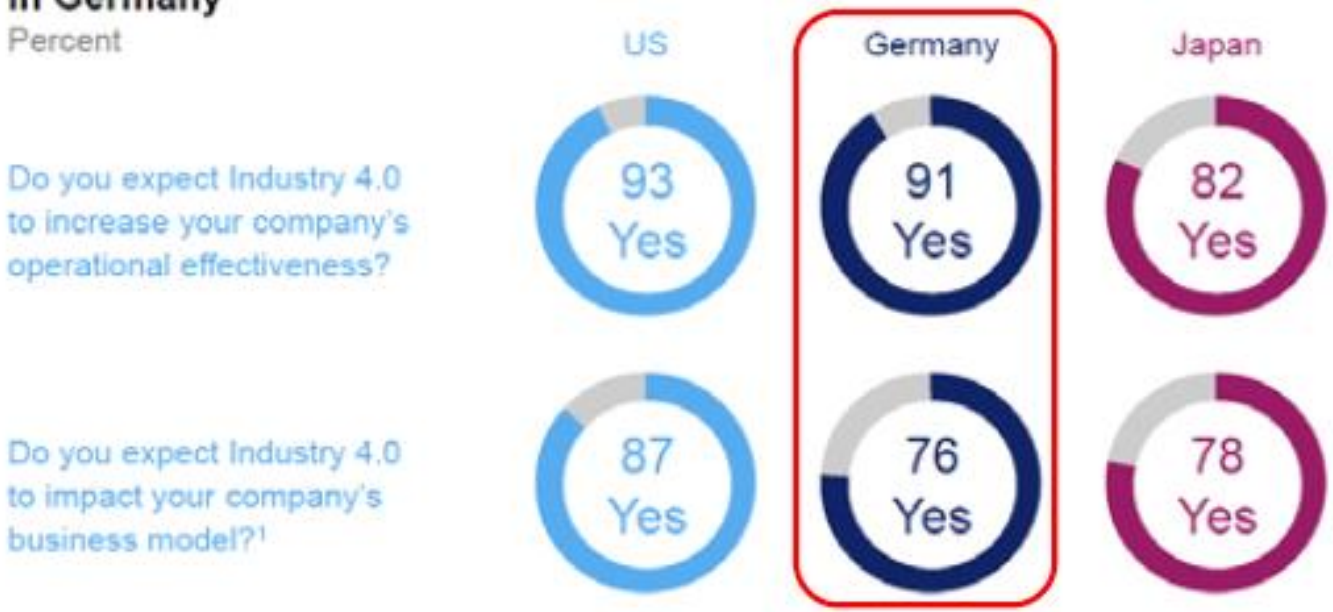
Composizione del campione

- 300 esperti in imprese con almeno 50 addetti
- Aree geografiche: US, Germania, Giappone
- Tipologia: produttori (vari settori) e fornitori di tecnologia

Operational Excellence o Business Model Innovation?

The sense that Industry 4.0 will improve operational excellence outweighs the idea that it will impact business models – a gap especially pronounced in Germany

Percent



Impatto sull'eccellenza operativa più che sul business model (soprattutto per i tedeschi)

Siamo Preparati?

US and German companies feel relatively well prepared while Japanese players feel unready

Do you consider your company well prepared for Industry 4.0?
Percent

USA e Germania pensano di essere abbastanza pronti (circa 70%), Giappone meno (36%)

Technology suppliers feel much better prepared than manufacturers

Do you consider your company well prepared for Industry 4.0?
Percent

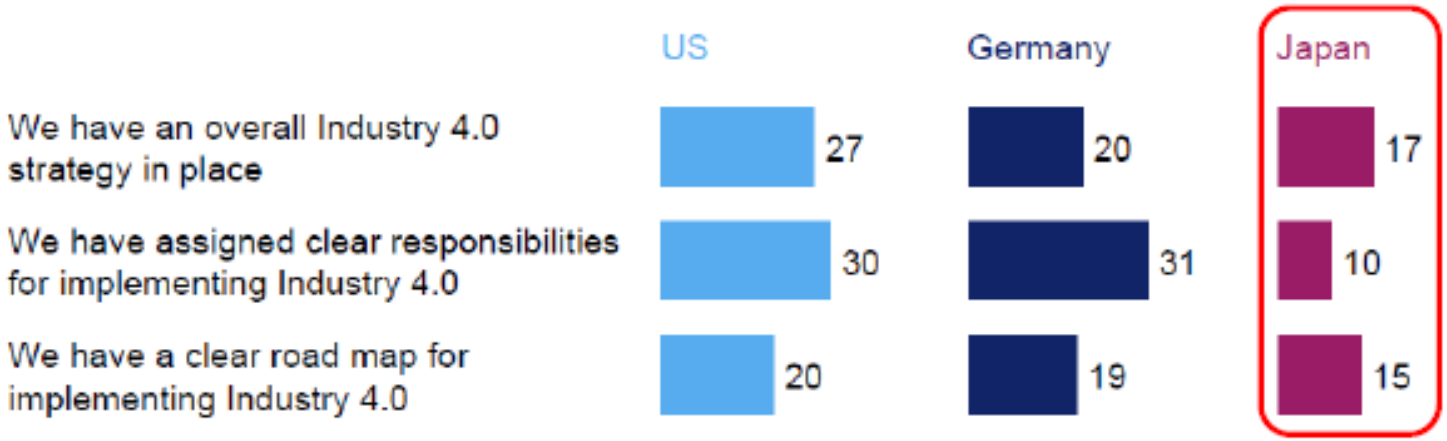
Percezione di preparazione maggiore nei fornitori di tecnologia (72% contro 49%)

Esiste una Strategia?

While feeling prepared, less than 30% of companies have an overall Industry 4.0 strategy in place and even fewer have a clear road map

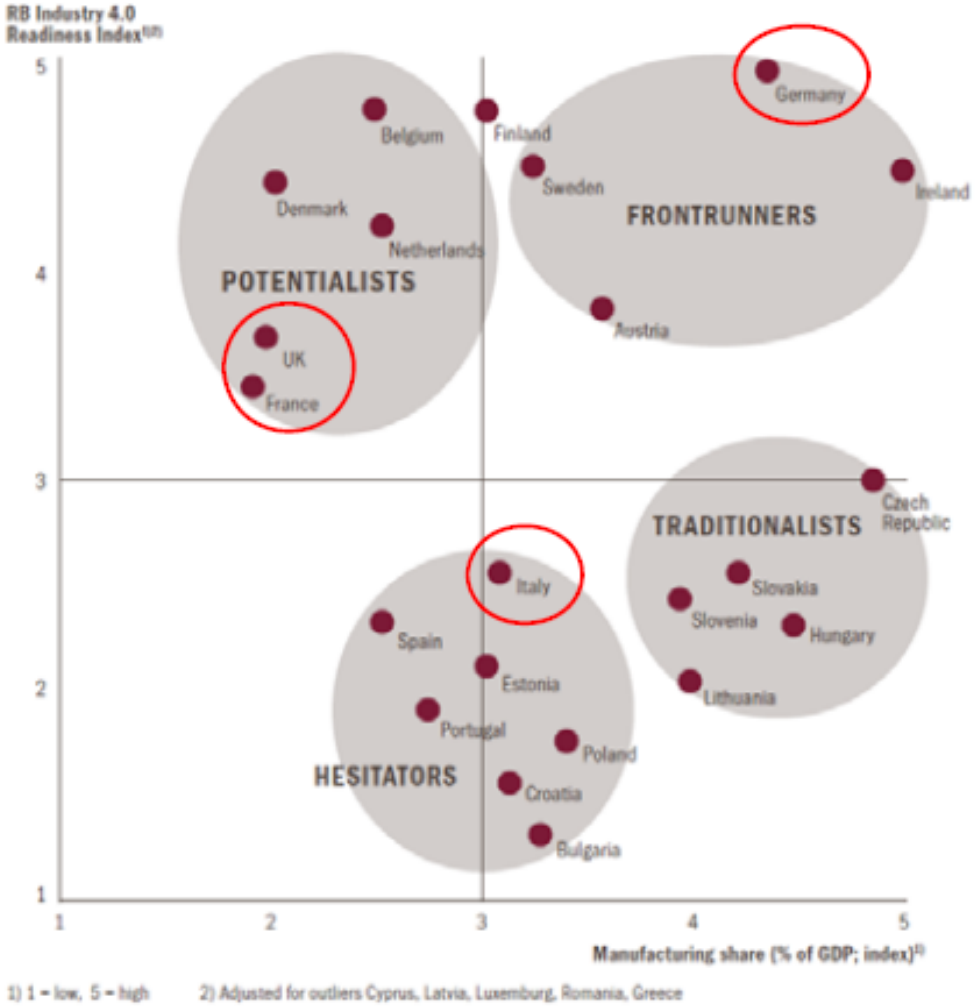
Which of the following statements hold true for your company?

Percent



<30% imprese hanno una strategia in USA e Germania
30% hanno assegnato responsabilità, 20% hanno una road map (in Giappone la situazione è peggiore)

I4.0 in Italia – Le Imprese



Quanto siamo pronti?

RB I4.0 Readiness Index

- Production process sophistication
- Degree of automation
- Workforce readiness
- Innovation intensity
- High value added
- Industry openness
- Innovation network
- Internet sophistication

[Fonte: Roland Berger, 2014, *Industry 4.0. The new industrial revolution. How Europe will succeed*]

Focus Italiano

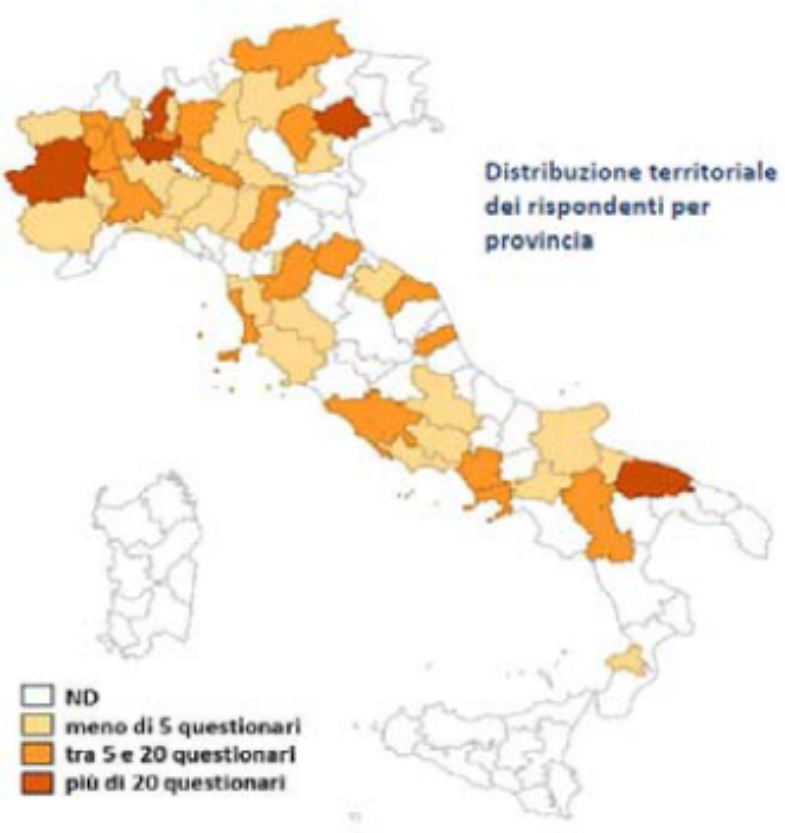
Fonte: Indagine Industria 4.0 di Federmeccanica,
a cura di Luca Beltrametti e Luca Persico, Università di Genova

527 imprese

Adopters **(≥ una tecnologia) 64%**

Adopters* vs. *Non adopters

- > Export (44% a 33%)
- > Dipendenti laureati 23% a 16%
- > investimento in R&S e formazione
- > contatti con università ed enti di ricerca



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La conoscenza delle tecnologie

INNOVAZIONE	*NON-ADOPTERS*	*ADOPTERS*	TOTALE
SICUREZZA INF.	86%	97%	93%
ROBOTICA	74%	92%	85%
MECCATRONICA	60%	87%	76%
STAMPA 3D	63%	83%	75%
CLOUD COMP.	53%	84%	72%
SIMULAZIONE	53%	82%	71%
IOT	40%	64%	55%
NANOTECH	39%	55%	49%
BIG DATA	32%	58%	48%
MATERIALI INTELL.	37%	47%	43%
ROBOTICA COLLAB.	29%	44%	38%

Equivoco antivirus?

La conoscenza di alcune tecnologie chiave è molto bassa!

Per alcune tecnologie l'adozione (e l'uso) sembrano più importanti per la conoscenza

Possibile una adozione graduale?

Focus Italiano

Fonte: Indagine Industria 4.0 di Federmeccanica,
a cura di Luca Beltrametti e Luca Persico, Università di Genova

Intenzioni di investimento dichiarate (% di imprese)

Tecnologia	Entro 1 anno	Fra 1 e 5 anni	Oltre 5 anni	Nessuna
Meccatronica	19	14	3	64
Robotica	20	19	4	57
Robot collaborativi	5	7	4	84
IoT	17	14	4	65
Big Data	14	14	3	69
Cloud	21	19	3	57
Cybersecurity	45	16	2	37
Stampa 3D	11	13	4	71
Simulazione	26	18	4	51
Nanotecnologie	6	5	6	84
Materiali intelligenti	8	8	7	77

>50% non intende investire in alcuna tecnologia

Solo per la cybersecurity almeno 2 imprese su 3 pensano di investire nei prossimi 5 anni

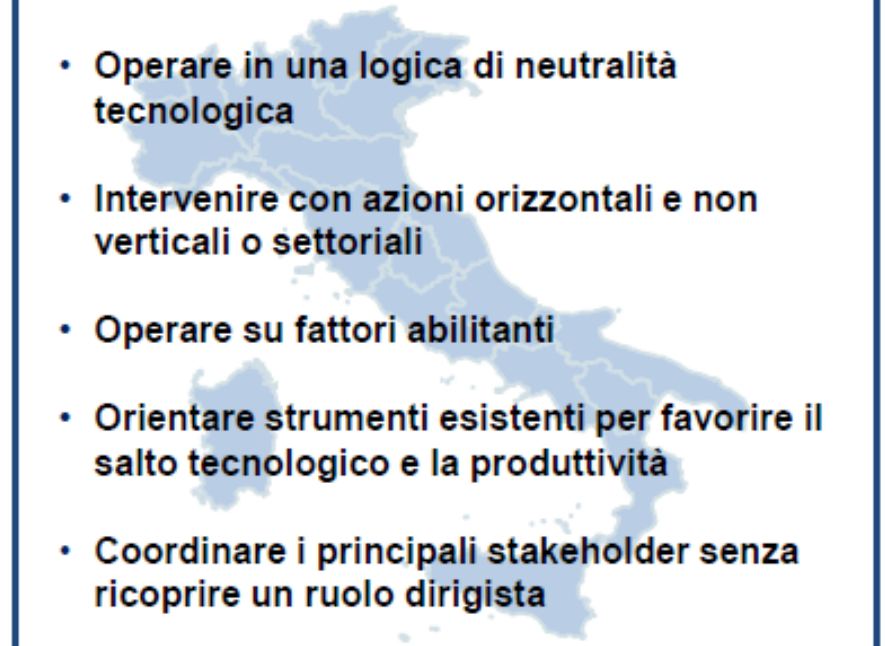
I non adopters intendono investire meno (non in tabella) → rischio di polarizzazione del divario!

I4.0 – Il Modello Italiano

Caratteristiche del settore industriale

- Pochi grandi player privati industriali e ICT in grado di guidare la trasformazione della manifattura italiana
- Limitato numero di capi filiera in grado di coordinare il processo evolutivo delle catene del valore
- Sistema industriale fortemente basato su PMI
- Ruolo chiave di prestigiosi poli universitari e centri di ricerca per sviluppo e innovazione
- Forte connotazione culturale dei prodotti finiti

Linee guida del Governo



- Operare in una logica di neutralità tecnologica
- Intervenire con azioni orizzontali e non verticali o settoriali
- Operare su fattori abilitanti
- Orientare strumenti esistenti per favorire il salto tecnologico e la produttività
- Coordinare i principali stakeholder senza ricoprire un ruolo dirigista

Piano Nazionale

Direttrici strategiche di intervento

Direttrici chiave

Investimenti innovativi

- Incentivare gli investimenti privati su tecnologie e beni I4.0
- Aumentare la spesa privata in Ricerca, Sviluppo e Innovazione
- Rafforzare la finanza a supporto di I4.0, VC e start-up

Competenze

- Diffondere la cultura I4.0 attraverso Scuola Digitale e Alternanza Scuola Lavoro
- Sviluppare le competenze I4.0 attraverso percorsi Universitari e Istituti Tecnici Superiori dedicati
- Finanziare la ricerca I4.0 potenziando i Cluster e i dottorati
- Creare Competence Center e Digital Innovation Hub

Direttrici di accompagnamento

Infrastrutture abilitanti

- Assicurare adeguate infrastrutture di rete (Piano Banda Ultra Larga)
- Collaborare alla definizione di standard e criteri di interoperabilità IoT

Strumenti pubblici di supporto

- Garantire gli investimenti privati
- Supportare i grandi investimenti innovativi
- Rafforzare e innovare il presidio di mercati internazionali
- Supportare lo scambio salario-produttività attraverso la contrattazione decentrata aziendale

Piano Nazionale

Obiettivi

Direttrici chiave

Investimenti innovativi

+10 €Mld
incremento investimenti privati da 80 a 90 €Mld nel 2017

+11,3 €Mld
di spesa privata in R&S&I con maggiore focus su tecnologie I4.0 nel periodo 2017-2020

+2,6 €Mld
volume investimenti privati early stage mobilitati nel periodo 2017 – 2020

Competenze

200.000
studenti universitari e **3.000** manager specializzati su temi I4.0

+100%
studenti iscritti ad Istituti Tecnici Superiori su temi I4.0

~1.400
dottorati di ricerca con focus su I4.0 (vs. ~5.000 previsti nel PNR)

Competence Center nazionali

Direttrici di accompagnamento

Infrastrutture abilitanti

100%
delle aziende italiane coperte a 30Mbps entro il 2020

50%
delle aziende italiane coperte a 100Mbps entro il 2020

6 consorzi
in ambito standard IoT presidiati in aggiunta ai tavoli istituzionali a partire dal 2017

Strumenti pubblici di supporto

+0,9 €Mld
Riforma e rifinanziamento per il 2017 del Fondo Centrale di Garanzia

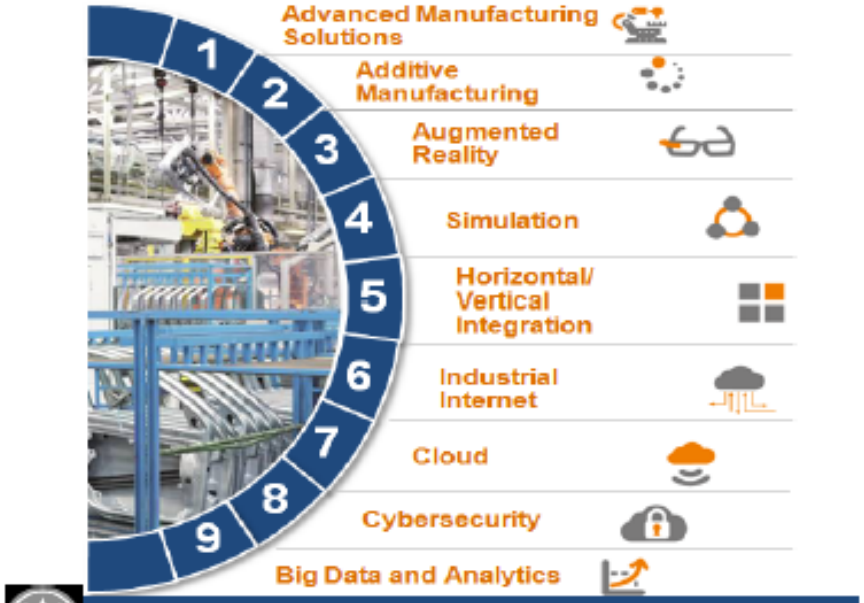
+1 €Mld
Contratti di sviluppo focalizzati su investimenti I4.0

+0,1 €Mld
Forte investimento su catene digitali di vendita (Piano Made in Italy)

Scambio salario – produttività tramite incremento RAL e limite massimo agevolabile

Iper- e Super-Ammortamento

Investimenti innovativi



Investimenti in tecnologie Agrifood , Bio-based economy e a supporto dell'ottimizzazione dei consumi energetici

Agevolazioni previste

Iperammortamento

- Incremento aliquota per investimenti I4.0

Attuale		*Proposta*
140%	⇧	250%

Superammortamento

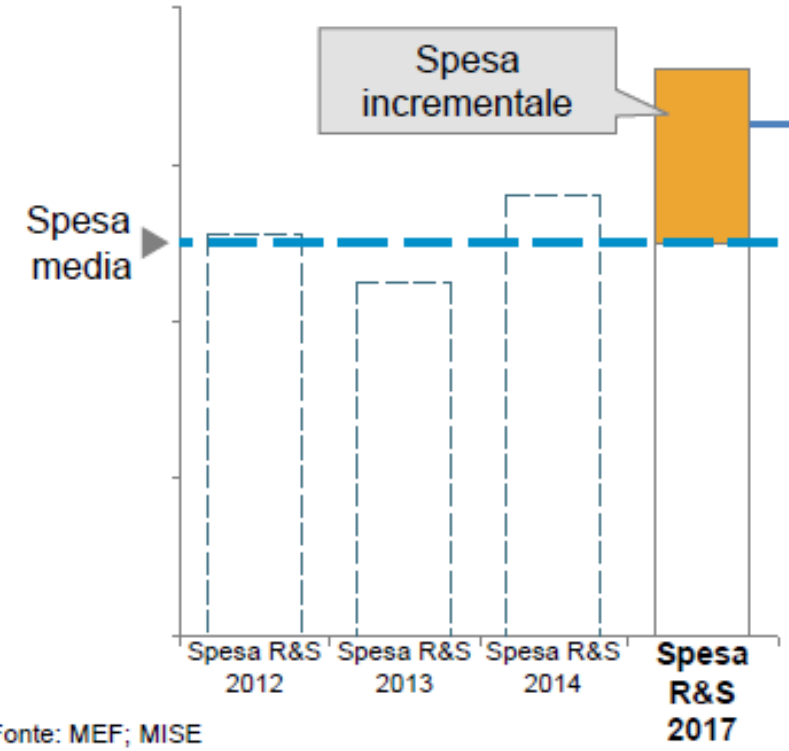
- Proroga del superammortamento con aliquota al **140**% ad eccezione di veicoli ed altri mezzi di trasporto che prevedono una maggiorazione ridotta al **120%**

Tempistiche

- Al fine di garantire la massima attrattività della manovra, estensione dei termini per la consegna del bene al **30/06/18** previo ordine e acconto >20% entro il 31/12/17

Credito d'Imposta per la Ricerca

Spesa in ricerca, sviluppo e innovazione – esempio 2017

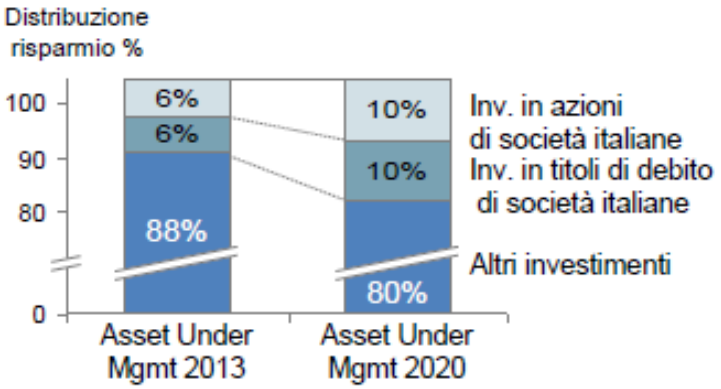


Fonte: MEF; MISE

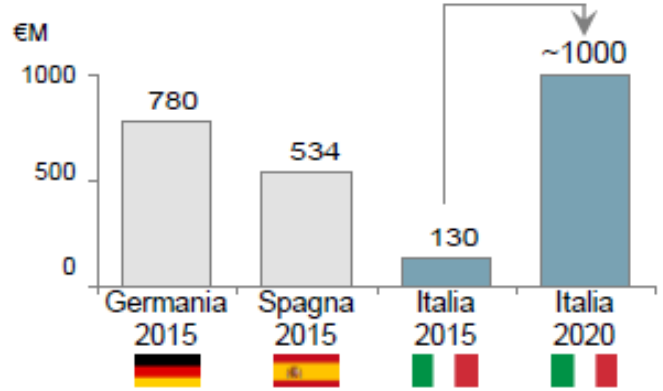
Calcolo credito	Attuale	Proposta
Aliquota spesa interna	25%	50%
Aliquota spesa esterna	50%	50%
Credito massimo per contribuente	5 €M	20 €M

Finanza a Supporto

Investimenti del risparmio nazionale[1]



Investimenti early stage



1. Fondi Aperti, Piani pensionistici e Piani assicurativi; valori 2013 pari a 1.069 €Mld;

Iniziative

- Detrazioni fiscali fino al 30% per investimenti fino a 1 €M in start-up e PMI innovative
- Assorbimento da parte di società "sponsor" delle perdite di start-up per i primi 4 anni
- PIR - Agevolazione fiscale mediante detassazione capital gain su investimenti a medio/lungo termine
- Programma "acceleratori di impresa", finanziare la nascita di nuove imprese con focus I4.0 con combinazione di strumenti agevolativi e attori istituzionali *(CDP)*
- Fondi di investimento dedicati all'industrializzazione di idee e brevetti ad alto contenuto tecnologico *(CDP)*
- Fondi VC dedicati a start-up I4.0 in co-matching (*CDP / Invitalia)*

Esempi

Iperammortamento

Esempio:
Investimento in beni I4.0 per 1.000.000 €

OGGI

Superammortamento: **140%** del valore ammortizzabile
→ riduzione tasse pagate in 5 anni pari a **96.000€**

DOMANI

Iperammortamento: **250%** del valore ammortizzabile beni I4.0
→ riduzione delle tasse pagate in 5 anni pari a **360.000€**

+275%

Credito d'imposta alla ricerca

Esempio:
Spesa incrementale per 1.000.000 €
- 800.000 € interna
- 200.000 € esterna

OGGI

Credito d'Imposta **300.000 €**
(In caso di spesa maggiore limite massimo a 5.000.000 €)

DOMANI

Credito d'Imposta **500.000 €**
(In caso di spesa maggiore limite massimo a **20.000.000 €**)

fino a +300%

Finanza a supporto di I4.0, VC e start-up

Esempio:
Investimento per 1.000.000 € in start-up innovative

OGGI

Detrazione fiscale:**19%**
Investimento massimo per contribuente:**0,5 €M**
→ Detrazione fiscale pari a **95.000 €/ anno**

DOMANI

Detrazione fiscale:**30%**
Investimento massimo per contribuente:**1,0 €M**
→ Detrazione fiscale pari a **300.000 € / anno**

+215%

Fonte: MISE

Iniziative Pubbliche - Competenze

Iniziative	Impegno privato	Impegno pubblico
Implementazione Piano Nazionale Scuola Digitale – *Direttrici* • Competenze per la Manifattura 4.0: atelier creativi, corsi di tecnologia e laboratori su I4.0 • Laboratori Territoriali: incontro scuola-impresa, sviluppo competenze digitali per Made in Italy • Curricoli Digitali: sviluppo di 25 curricoli con focus digitale su tematiche I4.0 • Pensiero Computazionale: formazione in pensiero computazionale alla scuola primaria	0 €M	355 €M[2]
Focalizzazione Alternanza Scuola Lavoro su percorsi coerenti con Industria 4.0		
Specializzazione di corsi universitari, Master e Master Executive su tematiche Industria 4.0 in partnership con player industriali e tecnologici	30 €M	70 €M
Incremento del numero di studenti degli Istituti Tecnici Superiori su tematiche Industria 4.0 mediante ampliamento dell'offerta formativa		
Potenziamento Cluster Tecnologici "Fabbrica Intelligente" e "Agrifood[1]" • Coordinamento con altri cluster tecnologici e stakeholder industriali	~ 70 €M	170 €M[3]
Incremento dottorati di ricerca su tecnologie Industria 4.0		
Creazione di selezionati Competence Center a livello nazionale su tematiche Industria 4.0	100 €M	100 €M
Adeguamento continuo delle competenze attraverso Fondi Interprofessionali	Budget in approvazione	
Totale	~200 €M	~ 700 €M

Iniziative Pubbliche - Infrastrutture

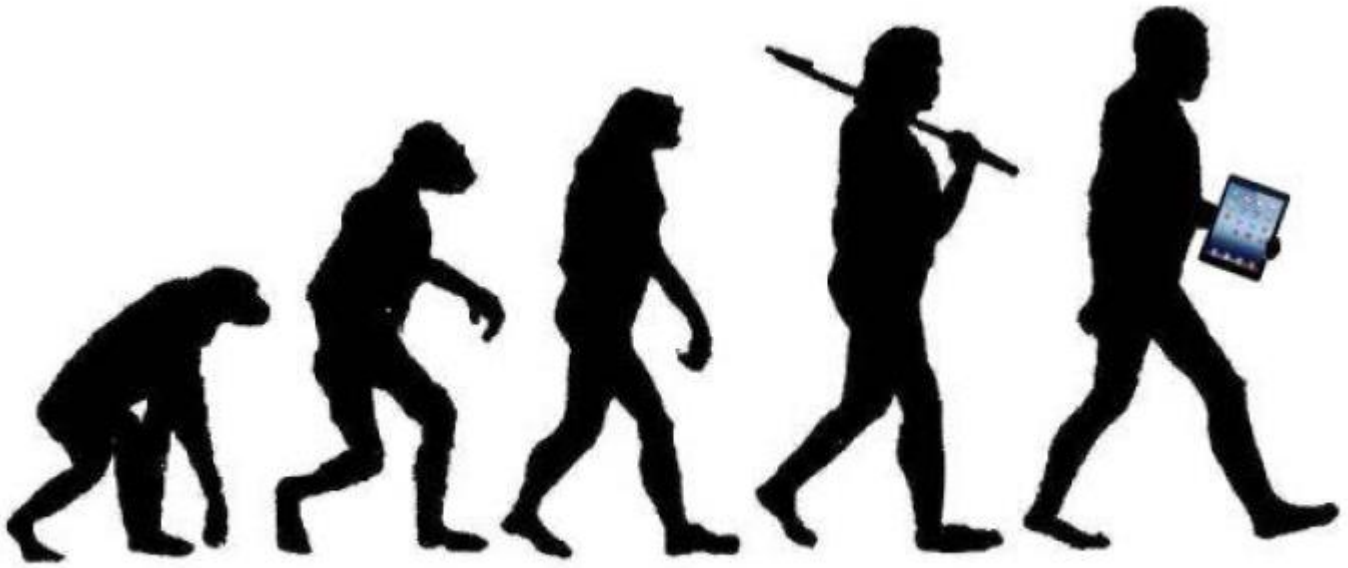
Iniziative	Impegno privato	Impegno pubblico
Banda Ultra Larga • 100% delle aziende coperte a 30 Mbps e almeno 50% delle aziende coperte a 100 Mbps, entro il 2020, tramite investimenti pubblici e privati	6 €Mld	'17-'20 6,7 €Mld
Fondo Centrale di Garanzia[1] • Riforma e rifinanziamento per l'anno 2017 del Fondo Centrale di Garanzia con focus su copertura investimenti I4.0	22 €Mld	'17 0,9 €Mld
Made in Italy • Forte investimento su catene digitali di vendita e incremento del supporto alle PMI (centri tecnologici, workshop, formazione)	1 €Mld[2]	'17 0,1 €Mld
Contratti di Sviluppo • Negoziazione ed erogazione di finanziamenti personalizzati in base alle esigenze specifiche delle imprese con priorità su progetti I4.0	2,8 €Mld	'17 1,0 €Mld
Scambio Salario - Produttività • Rafforzamento dello scambio salario produttività tramite incremento RAL e limite massimo somma agevolabile	TBC N/A	'17-'20 1,3 €Mld
Totale	~32 €Mld	~10 €Mld

Digital transformation

Let me say…

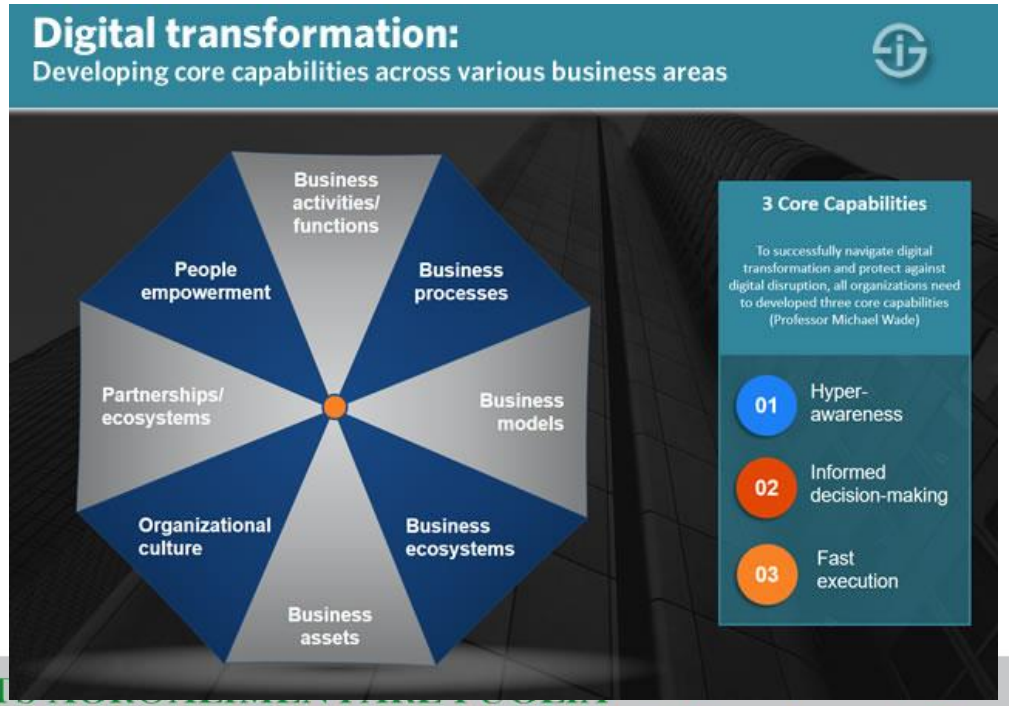
amazon go

Digital transformation: beyond the business context

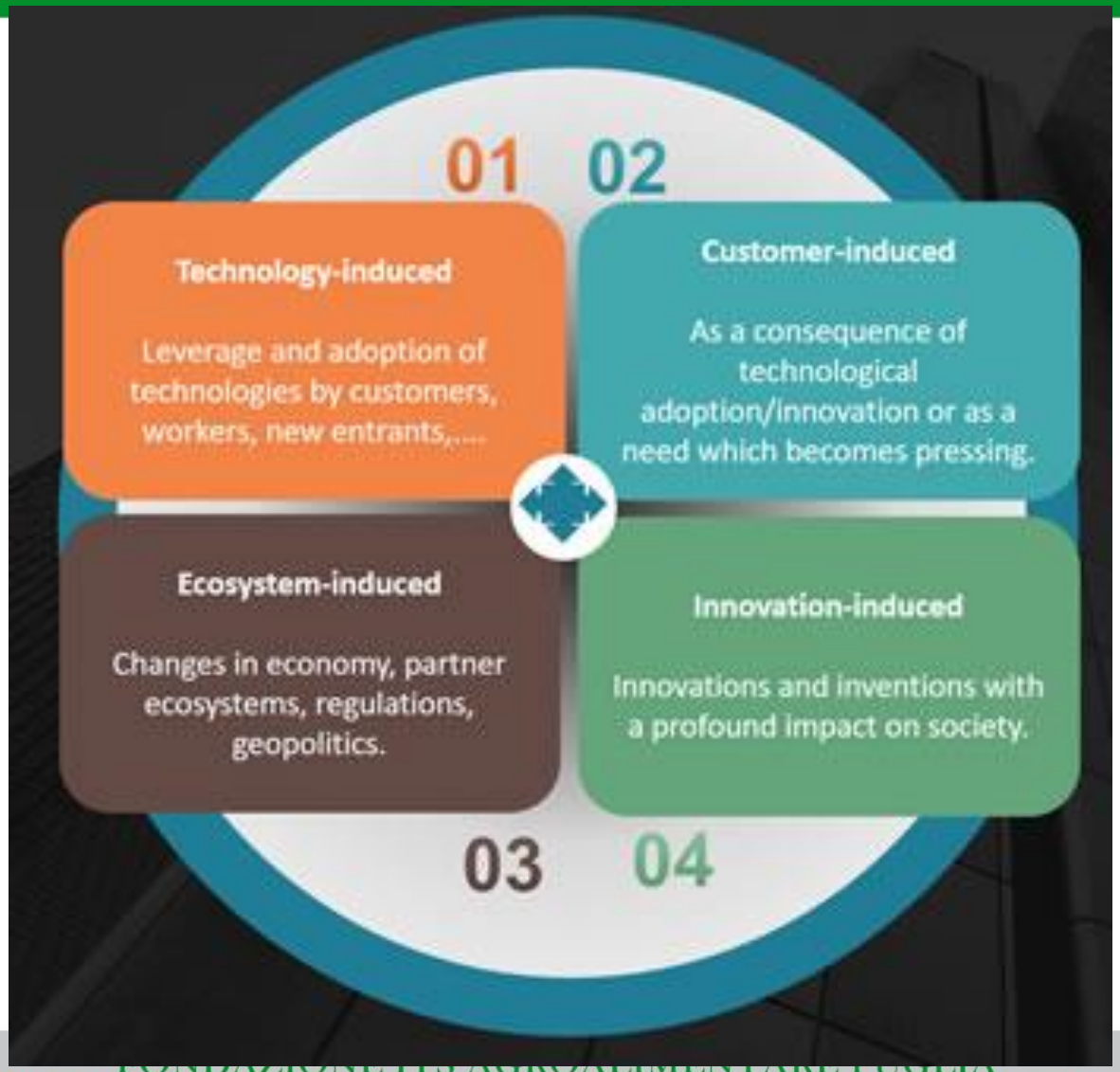


Digital transformation: what is?

Digital transformation is the profound transformation of business and organizational activities, processes, competencies and models to fully leverage the changes and opportunities of a mix of digital technologies and their accelerating impact across society in a strategic and prioritized way, with present and future shifts in mind



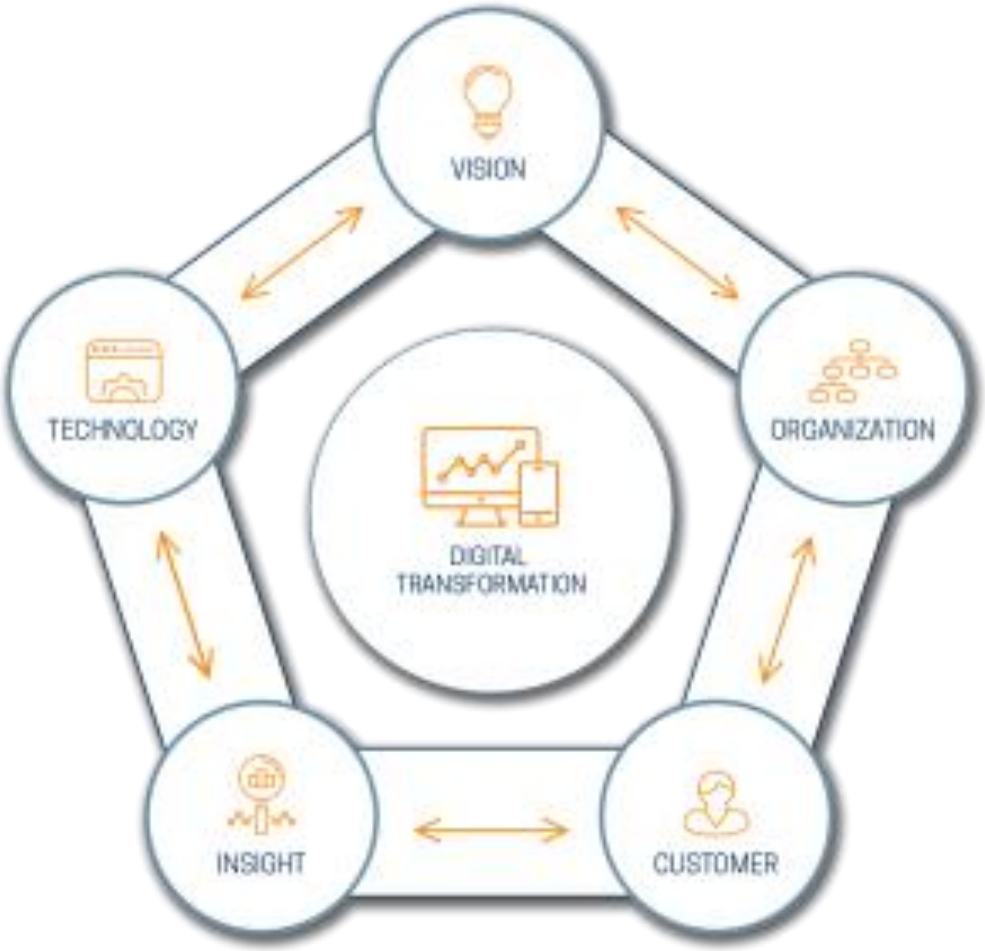
Causes of transformation



Where does it happen?

Myth vs. reality

Core competencies



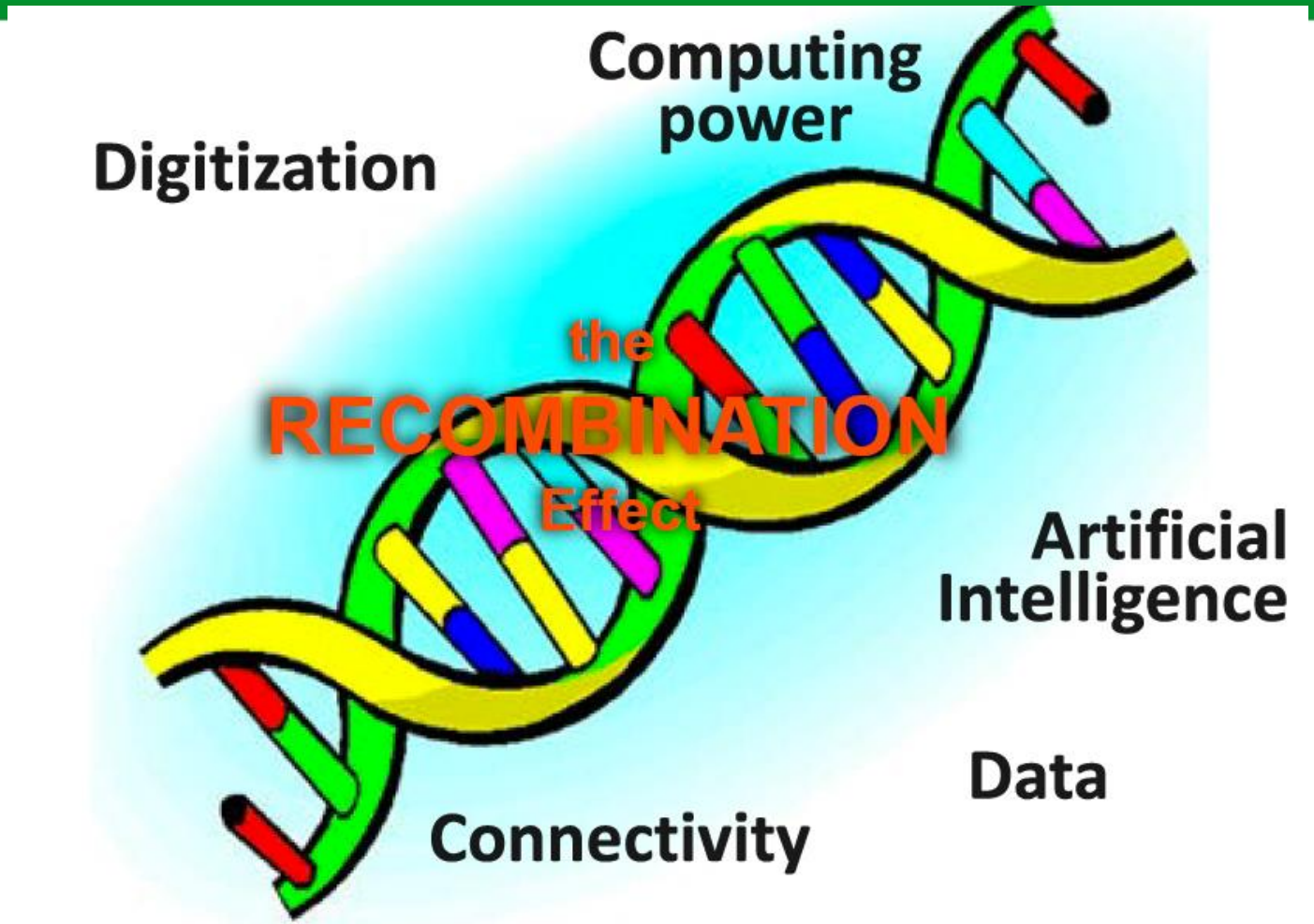
Core competencies

	VISION	ORGANIZATION	CUSTOMER	INSIGHT	TECHNOLOGY
5 Transformative	Vision is crystal clear at all levels of organization. Roadmap execution well underway and continuously evolving with feedback loop of insights.	Structure aligned with work. Departments are well integrated/highly collaborative. Incentives unite groups. Digital culture is innate.	All teams understand their customer; embrace customer needs/solving customer problems as drivers to their work. Actively leverage customer data to optimize experience.	Insights-driven business. Rigorous use of big data and advanced analytics to drive action and outcomes through highly integrated systems of insight. Cross-functional insight teams continuously develop and test new insights.	Fully integrated Data-Insight-Action loop enabled by "System of Insight" architecture. Digital capabilities undeniably driving culture, decisions, and market share growth.
4 Strategic	Digital vision communicated clearly, consistently, and frequently by leadership; both internally and externally. Proper leadership in place to execute the vision across all departments of the organization.	No distinction between business and technology; all is one. Agile processes entrenched in culture. Proper digital skills sought in all departments.	Data-driven journey mapping is the norm. Content strategy and personalization initiatives are well-underway, adequately funded, and considered paramount to corporate success.	Clear data and analytics strategy supported by, and driving decisions at, the top of the organization. First- and third-party data sources integrated to provide complete view of customer journeys, driving outcomes.	Architecture and systems enable measurement of processes, decisions, and outcomes. Analytics and AI infrastructure drives insights and competitive advantage vis-à-vis competitors.
3 Committed	C-level sponsorship of change initiatives. Vision understood by many. Key leaders in place to execute digital strategy.	Agile transformation in full swing. Widely held belief that corporate success depends on digital superiority. Cross-functional collaboration becoming the norm.	Customer-first mentality embedded in processes and culture. Journey mapping, content strategy, and personalization are in the discussion.	Data and insights shared across organizational silos. If asked, all levels in the organization would say the company is, or is aspiring to be, a data-driven organization.	Architecture focused on enablement. Committed to big data, analytics, omnichannel integration, and providing personalized customer experiences. Full capabilities not necessarily in place.
2 Evolving	Importance of Digital Transformation recognized, but roadmap and implications for business plans still evolving.	Old processes and organizational structure preventing agile practices from taking hold. Recognition of need for change, but organization lacks the skills and know-how to champion sufficient inertia.	Journey mapping becoming part of any new digital initiative. Awareness that customer-centricity is important, but skills and experience still developing.	Elements of data and measurement collected, but not properly integrated to provide insights. Lack of in-house analytics talent.	Well-understood architecture; does not consider possible future paths. Technology drives/limits requirements.
1 Business As Usual	North Star vision non-existent or does not contemplate the key role digital technology will play in future success.	Heavily siloed. Departments see each other as non-allies. Heavily political. Skillsets not aligned with digital economy.	Teams "know better" than their customers. Unsophisticated and inadequate understanding of customers and journeys.	Design and development decisions/priorities are not informed by customer insight. Decisions are based on personal beliefs and biases. Marketing messages and content are not informed by customer insight.	Stuck in old/hard to iterate technology. Silver bullet mentality. Perpetual science fair/churn. No clear architecture.

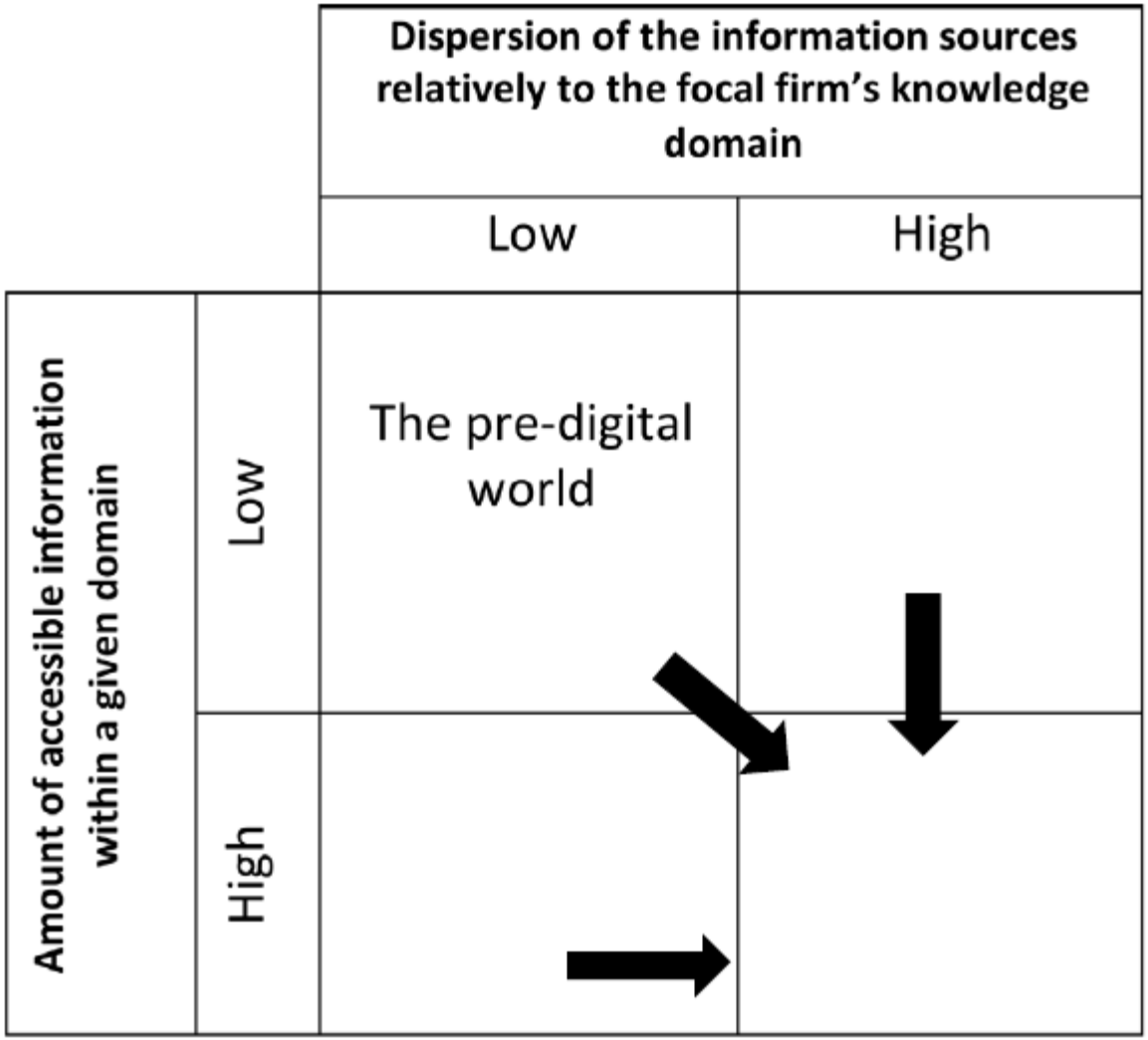
Technologies

- Computing power / “Cloud”
- Connectivity
- Data
- Artificial Intelligence / Automation

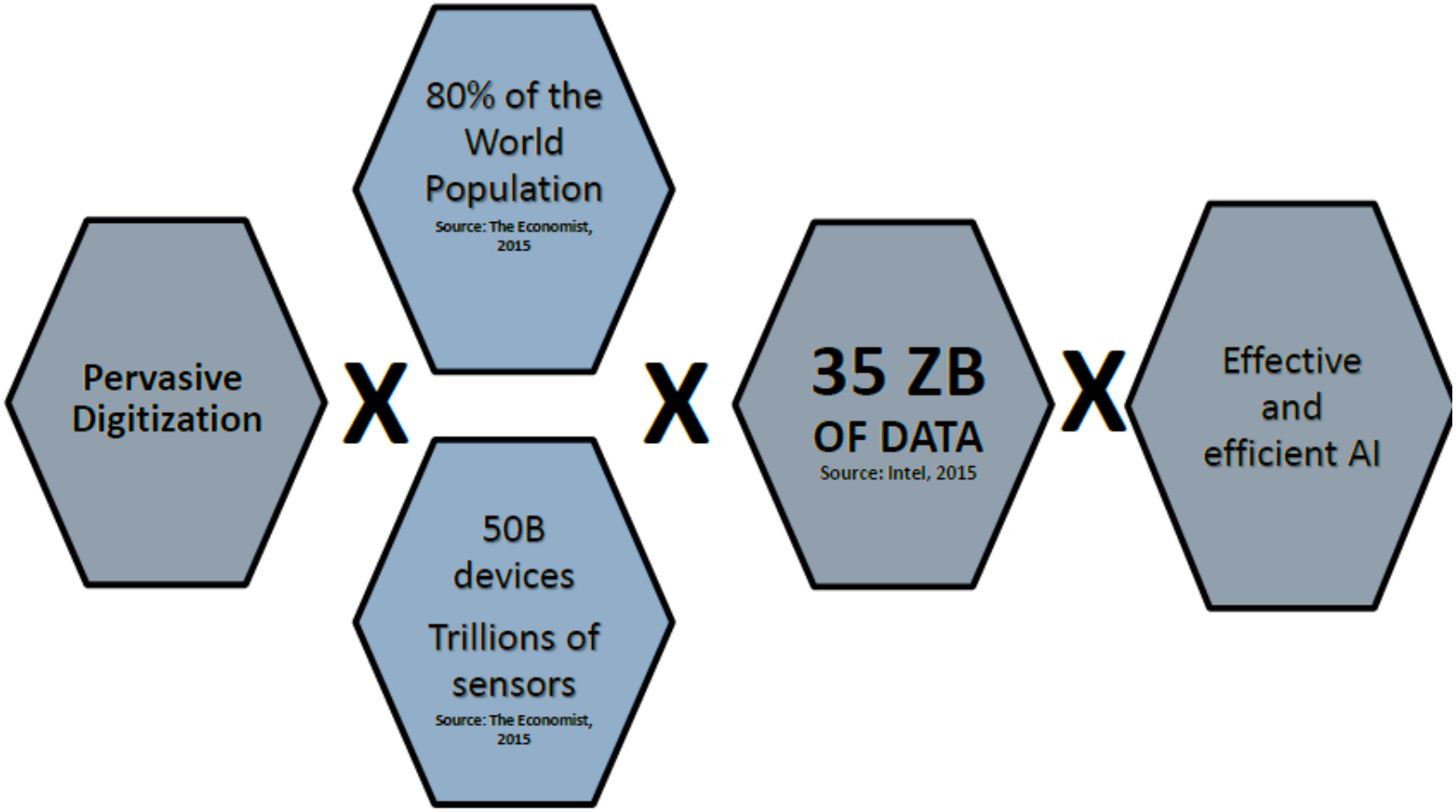
Digitalization



Digitalization



By 2030

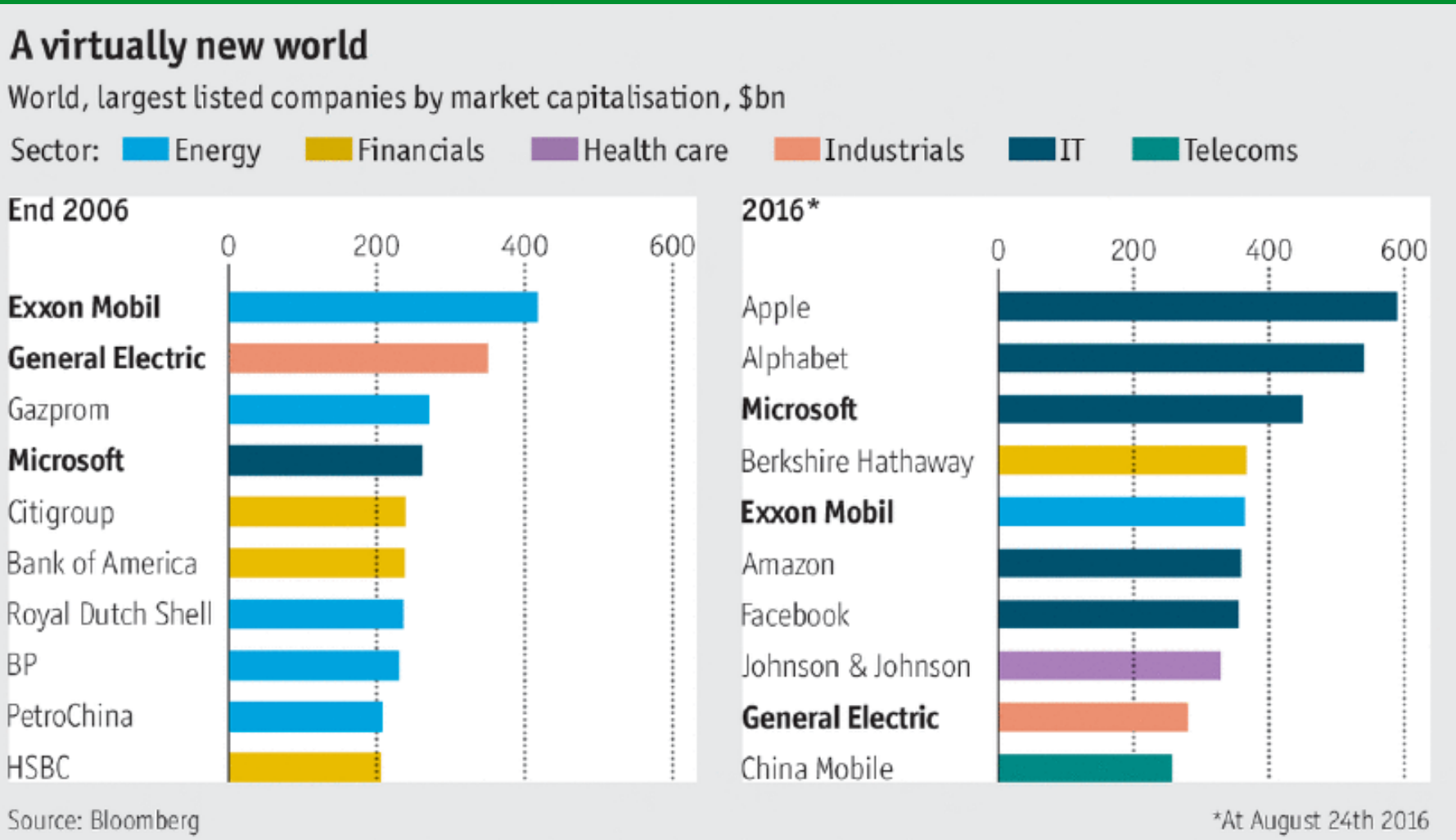

Pervasive Digitization
X
80% of the World Population
Source: The Economist, 2015
50B devices
Trillions of sensors
Source: The Economist, 2015
X
35 ZB
OF DATA
Source: Intel, 2015
X
Effective and efficient AI

For the future…

"In the future, 50-60% of the value of a car will consistent of digital devices and tools, and 20% of batteries."

Peter Altmaier, Chief of Staff of the German Chancellery and Federal Minister for Special Affairs since December 2013.

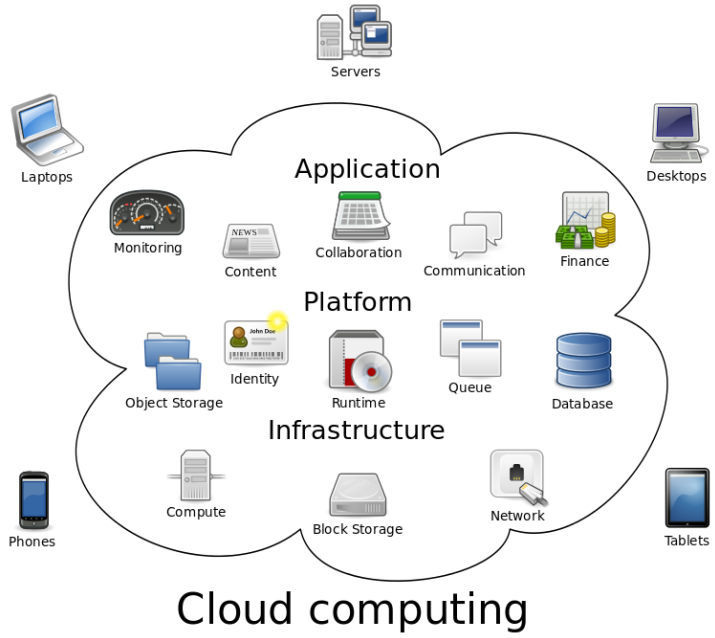
For the future…



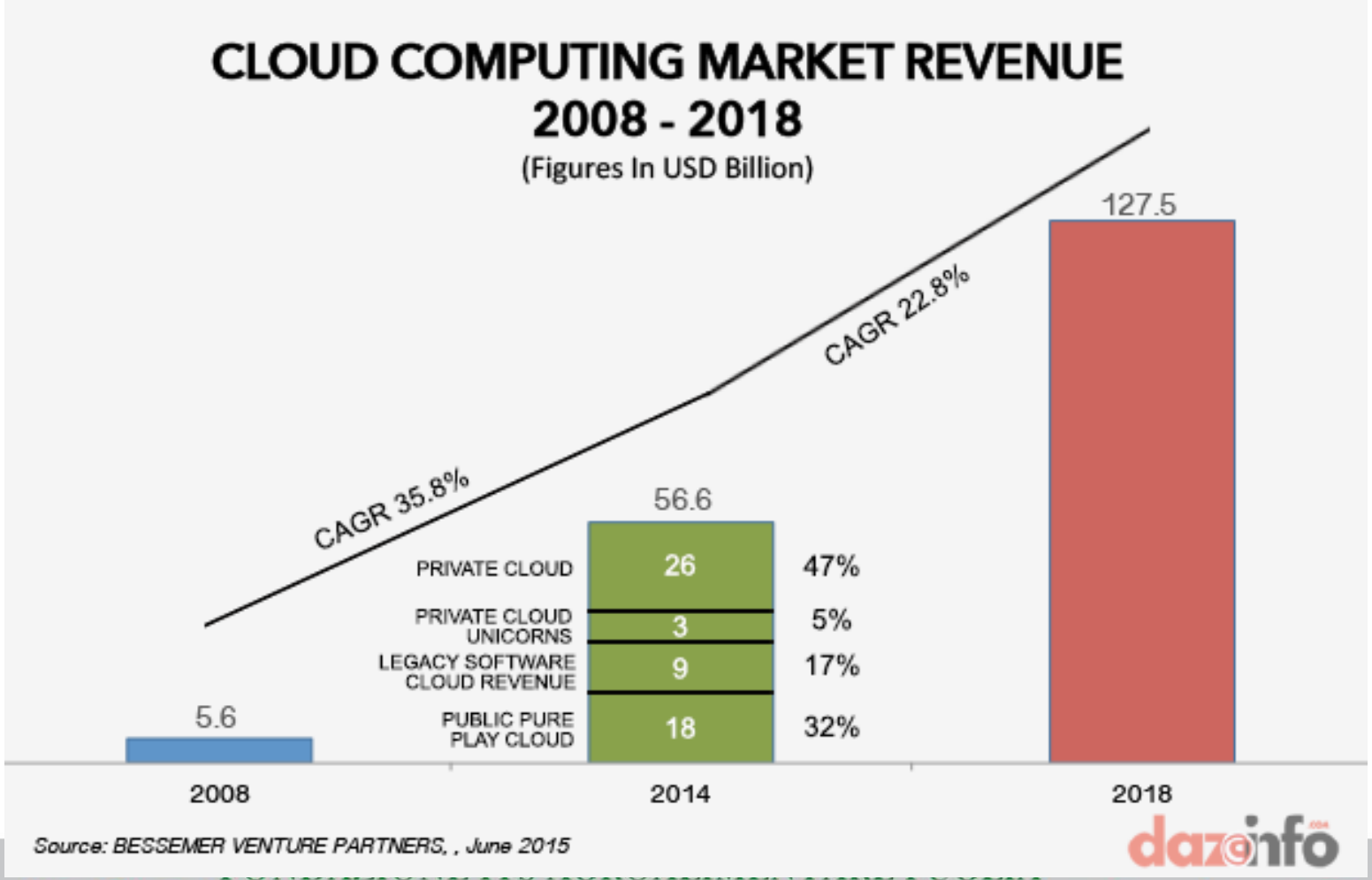
Cloud computing: what is it?

A model for enabling ubiquitous access to shared pools of configurable resources, which can be rapidly provisioned with minimal management effort, over the Internet

Cloud computing allows users and enterprises with various computing capabilities to store and process data either in a privately-owned cloud, or on a third-party server located in a data center - thus making data-accessing mechanisms more efficient and reliable



Cloud computing: the market value



Cloud computing: players

IT Vendors

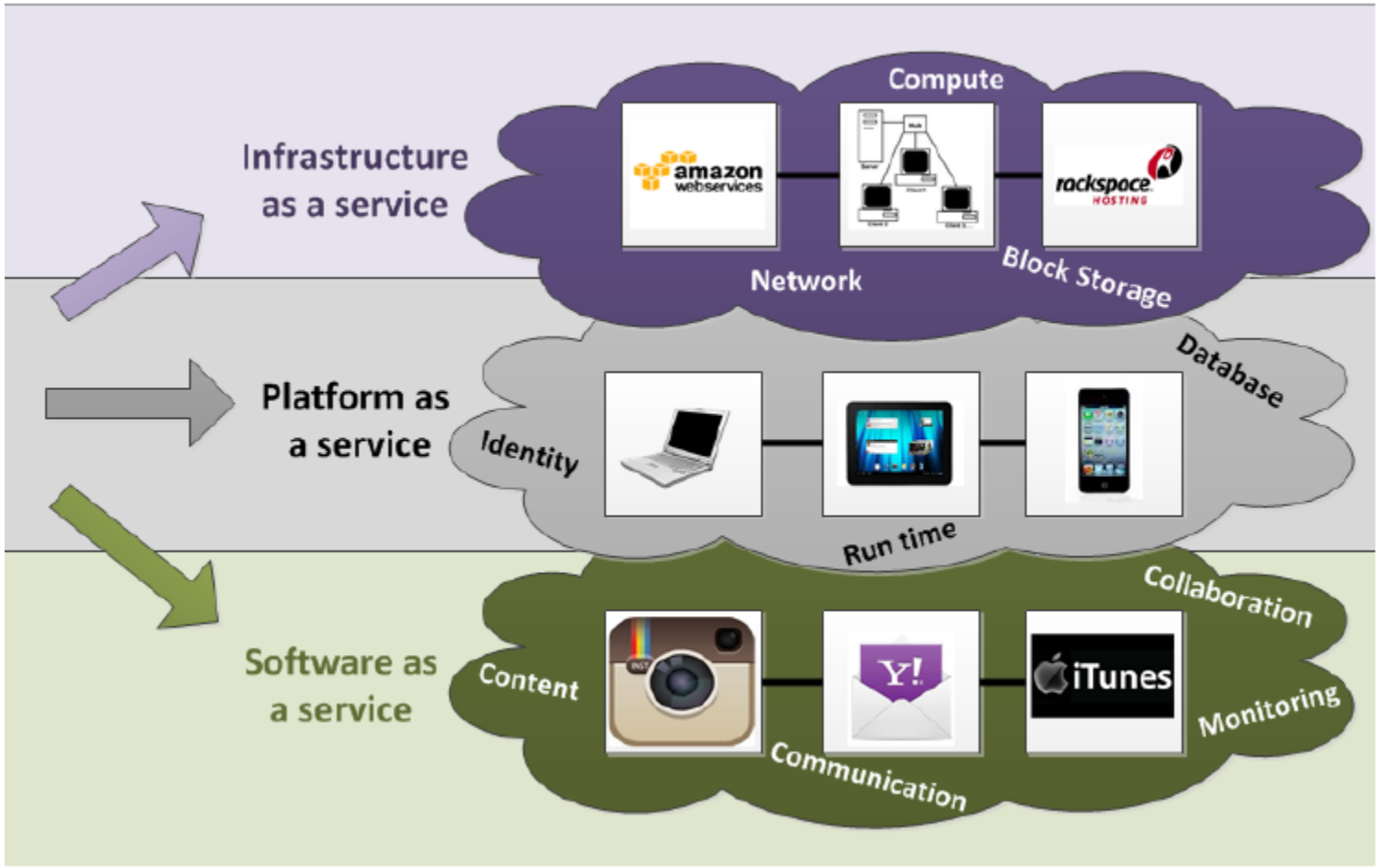
Online Service Providers

Hardware Vendors

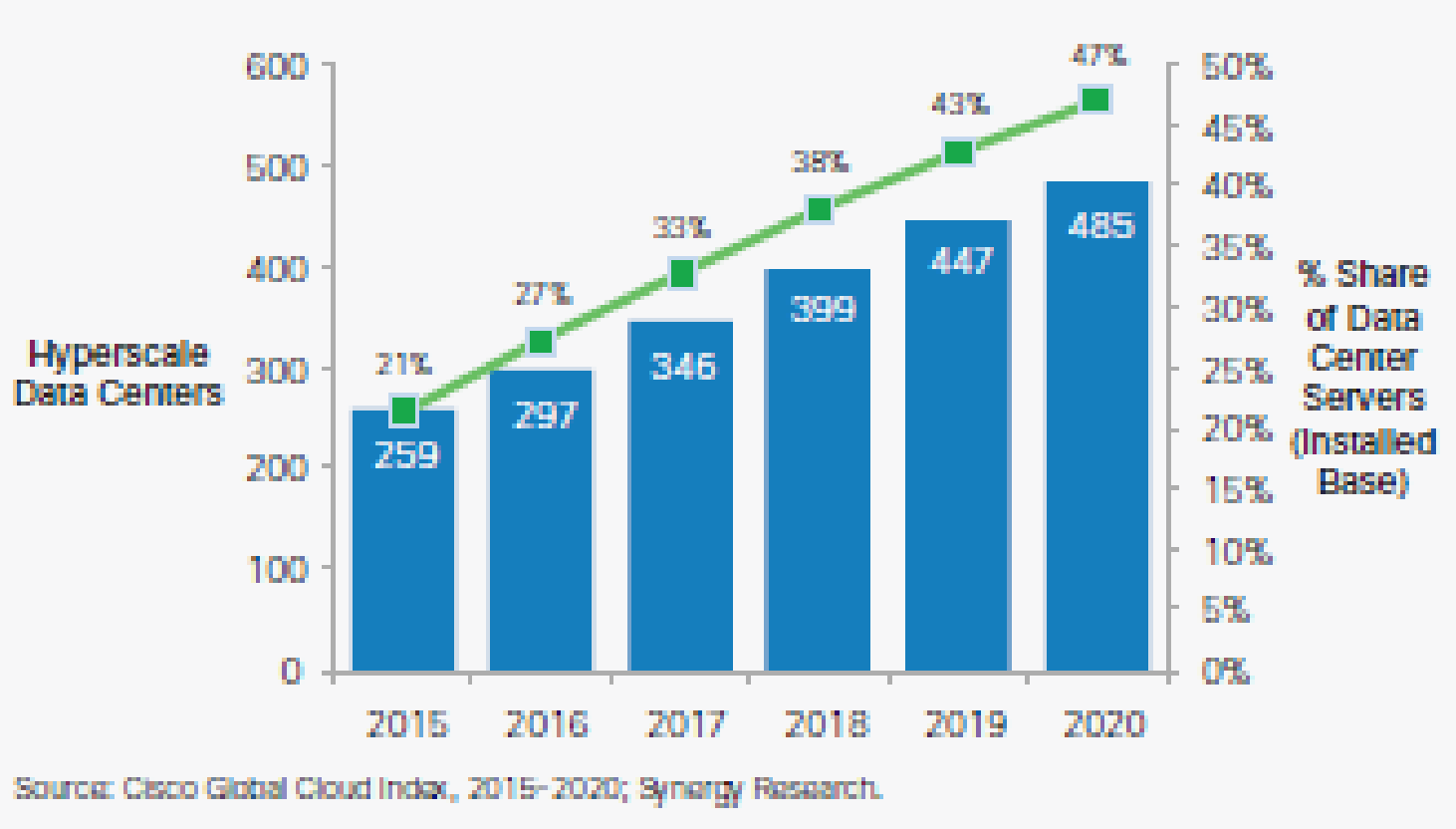
Niche Start-Up

Cloud computing: value chain

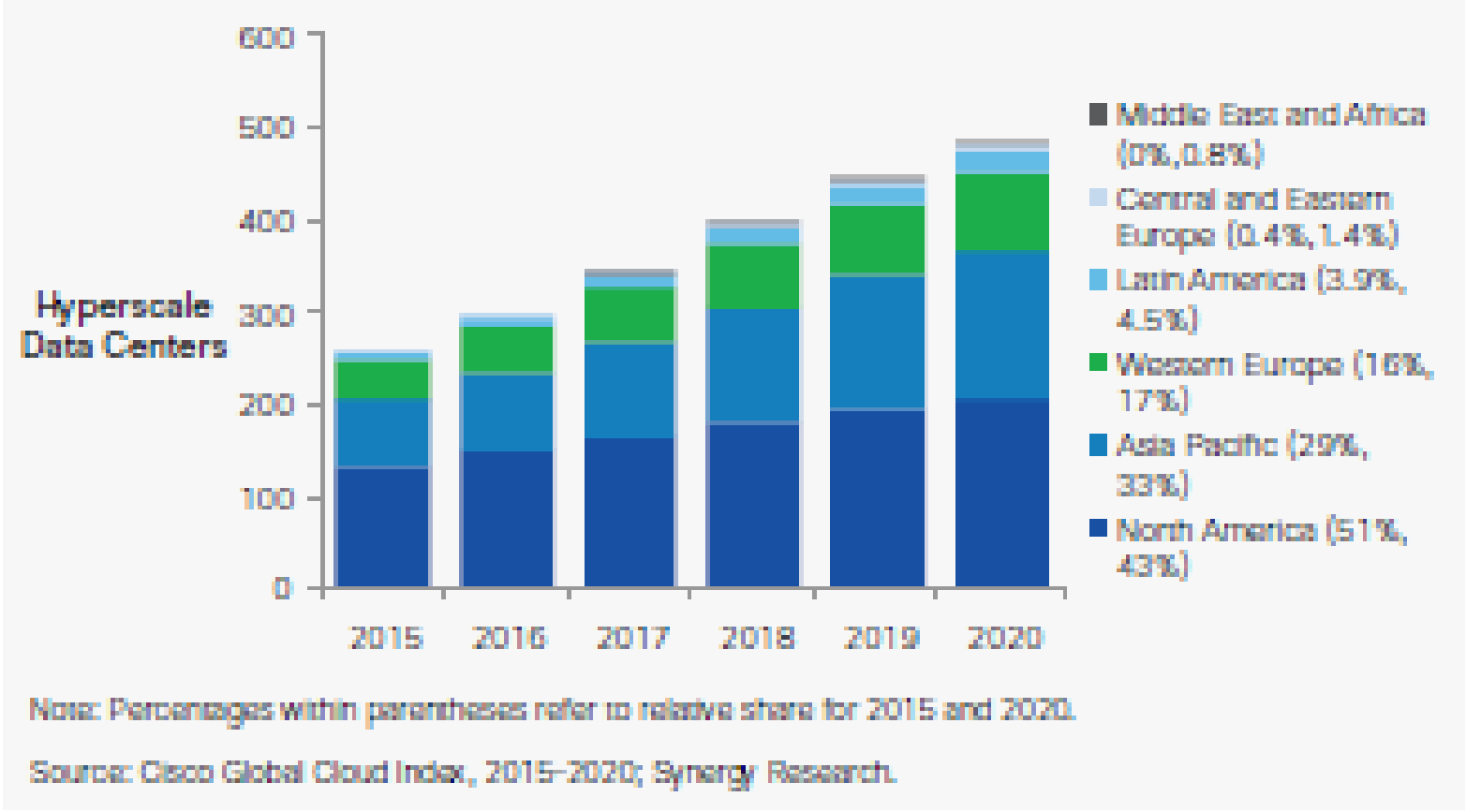
Cloud computing: type



Cloud computing: why?



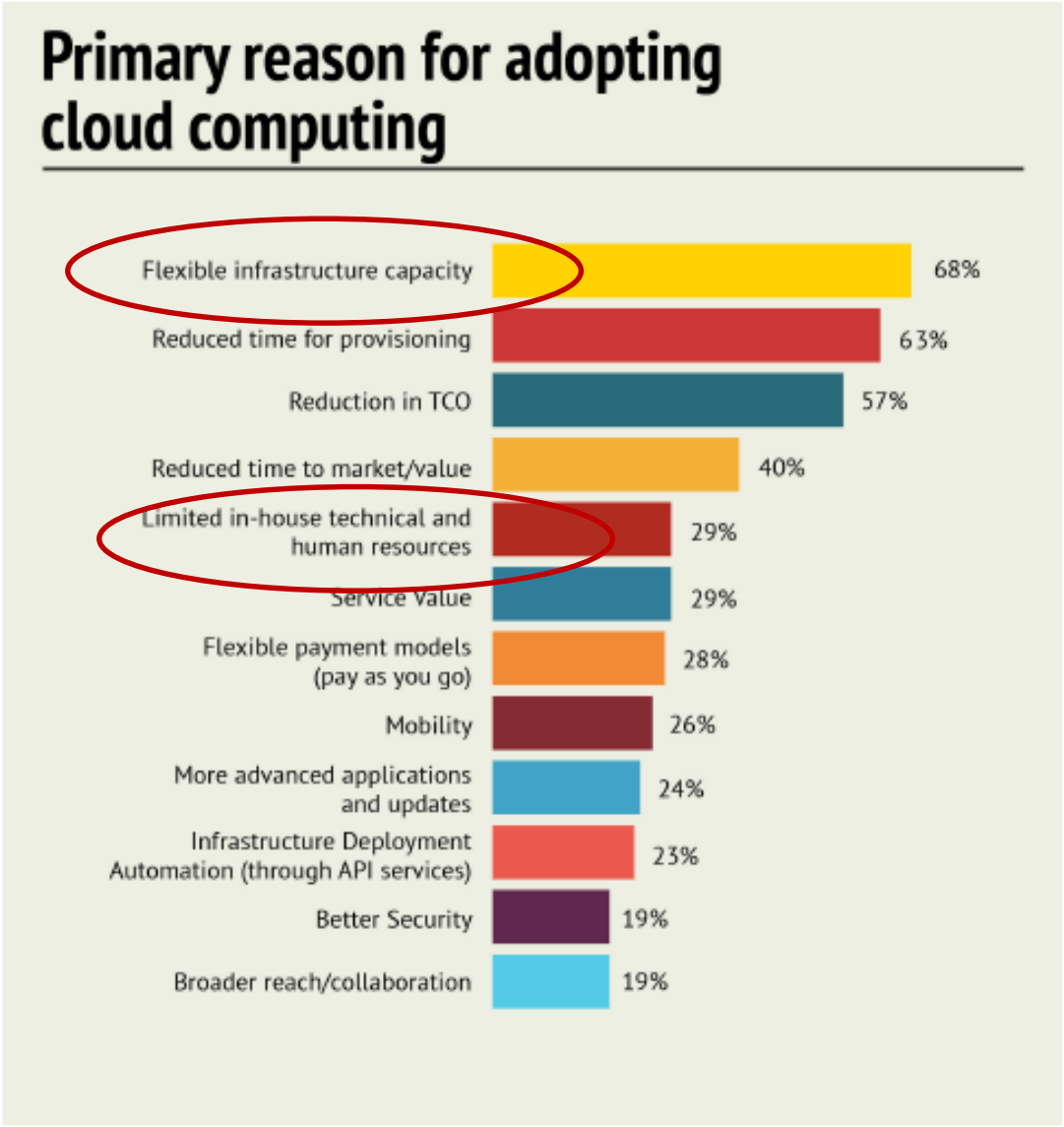
Cloud computing: where?



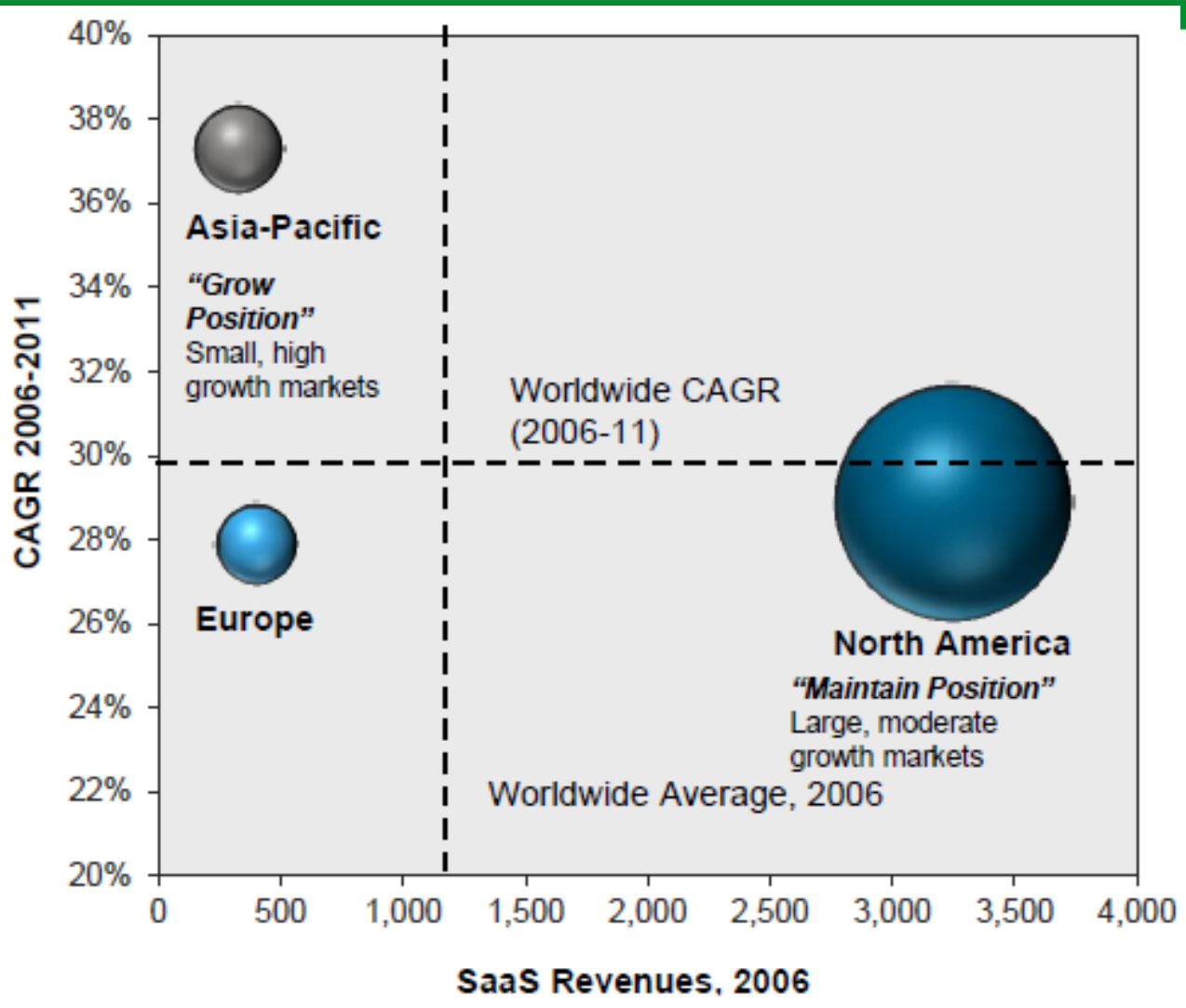
Note: Percentages within parentheses refer to relative share for 2015 and 2020.

Source: Cisco Global Cloud Index, 2015-2020; Synergy Research.

Cloud computing: why?



Growth of SaaS



Cloud computing: applications

Cloud computing: applications

Apps	Definitions
Stream basic video and music	Deliver sound and video without the need to download files of different audio or video formats using computer servers connected to the Internet to access information.
Text communications (email and instant messaging)	A cross-platform messaging application that allows the exchange of messages without having to pay for Short Message Service (SMS), using an Internet data plan.
Voice over IP (VoIP) (Internet telephony)	A broad range of services transmitting voice over the Internet.
Web browsing	Accelerate web experiences and searching through cloud computing using technology to shift the workload to the cloud servers.

Apps	Definitions
Web conferencing	A cloud application used to interact with other participants and have that live and in-person feeling for attendees; it offers services such as collaborative web browsing and application sharing.
Cloud-based learning management system	This app provides the user with the flexibility of being able to access and collaborate with others in a centralized environment. With information housed in a virtual storage environment, it allows work to be completed outside the boundaries of the formal learning or work institutions.

Cloud computing: applications

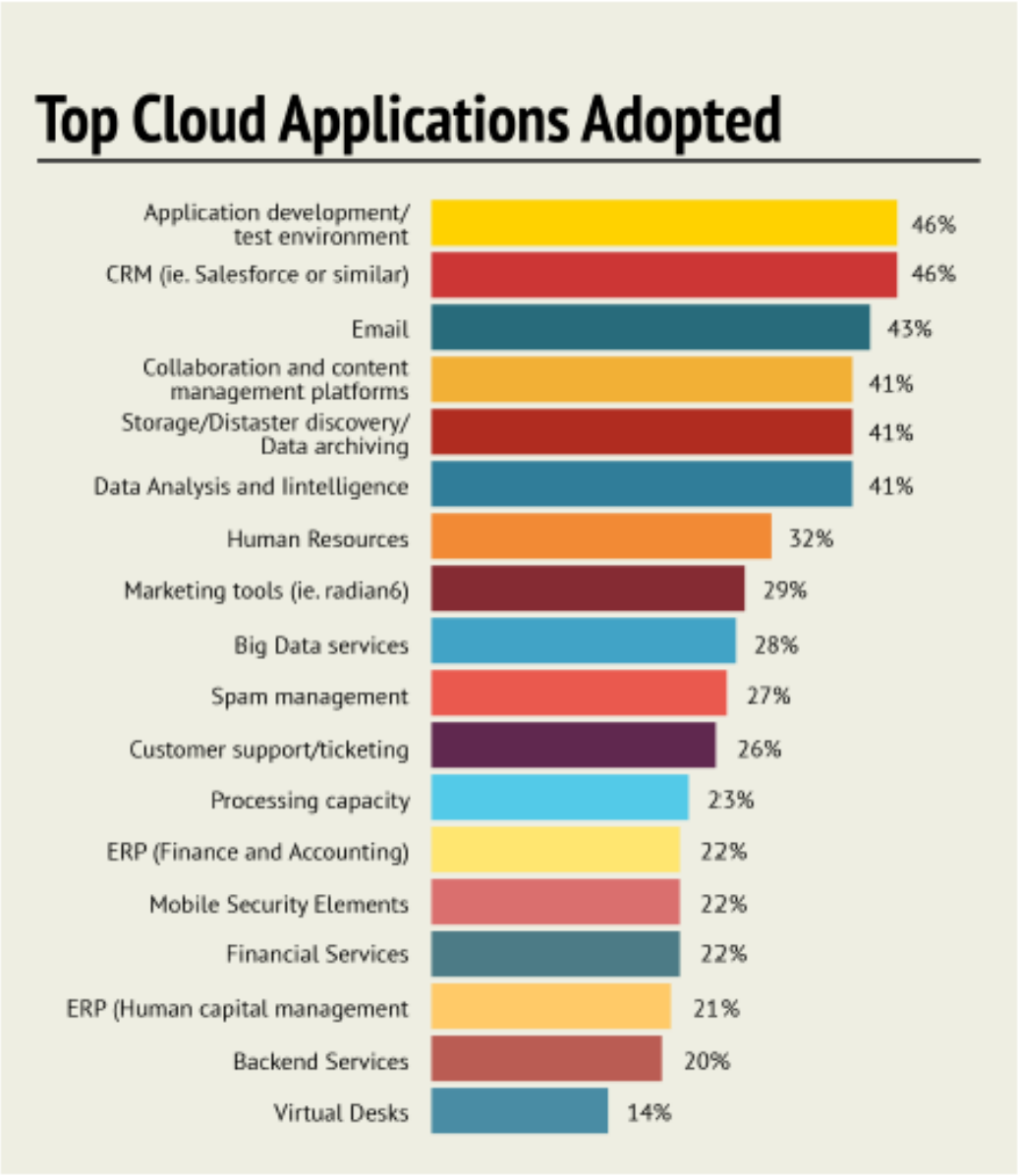
Apps	Definitions
Enterprise resource planning (ERP) and customer relationship management (CRM)	ERP and CRM systems allow businesses to manage their business and business relationships and the data and information associated with them.
High-definition (HD) video streaming	Deliver HD video without the need to download files of HD video formats using computer servers connected to the Internet to access information.
Augmented reality (AR) gaming applications	Augmented reality (AR) games involve a live direct or indirect view of a physical, real-world environment whose elements are augmented (or supplemented) by computer-generated sensory input such as sound, video, graphics, or GPS data.
Web electronic health records (EHRs)	EHRs are designed to contain and share information from all providers involved in a patient's care in a structured format allowing patient information to be easily retrieved and transferred in ways that can aid patient care.
Voice over LTE (VoLTE)	This standardized system allows for transferring traffic for VoLTE.
Personal content locker	Asynchronous storage enables applications that use compound files to efficiently render their content when accessed by means of existing Internet protocols, with a single request to a server triggering the download of nested objects contained within a webpage, eliminating the need to separately request each object.

Cloud computing: applications

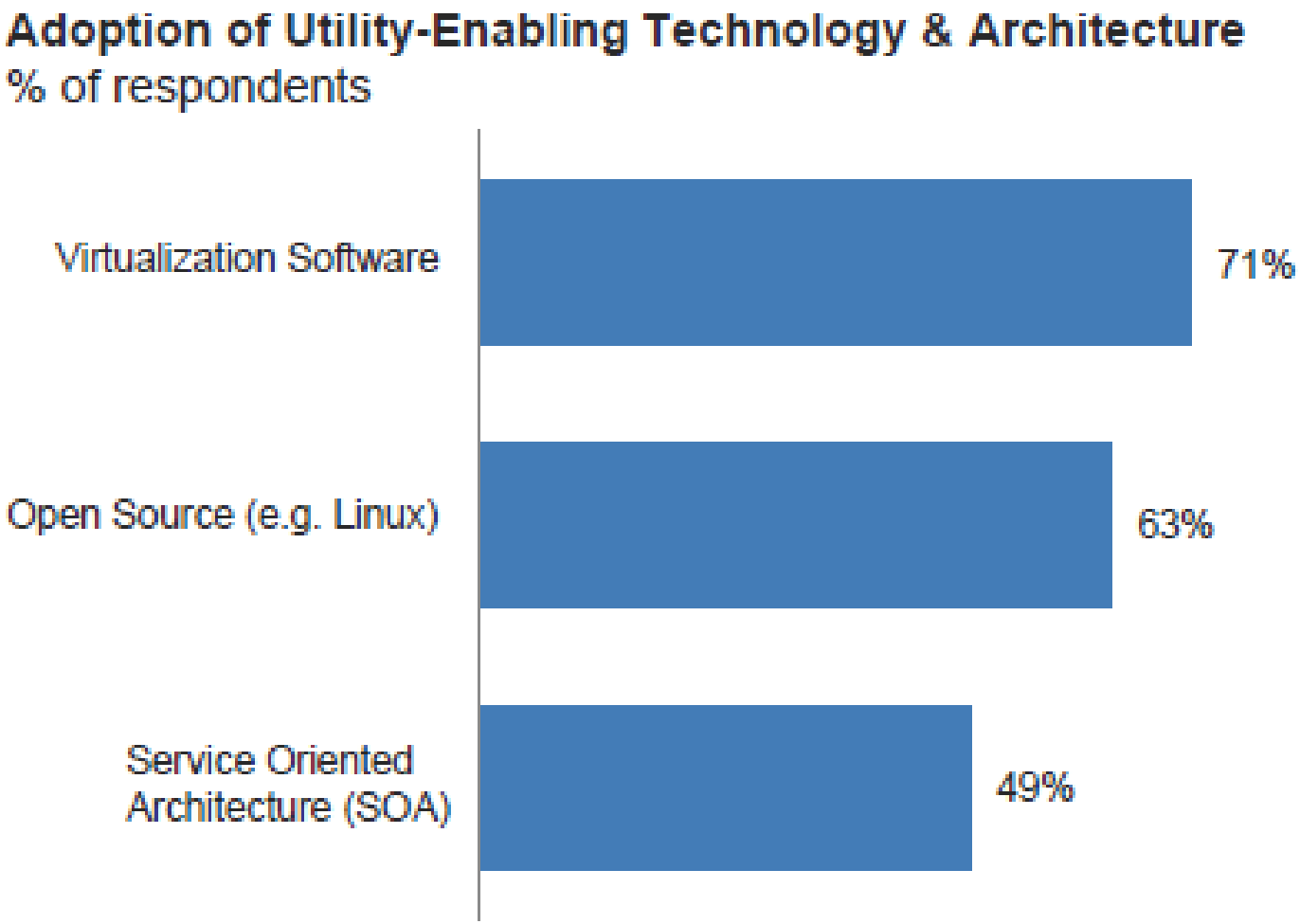
Apps	Definitions
Telemedicine	Telemedicine is the use of medical information exchanged from one site to another through electronic communications to improve a patient's clinical health status and includes using two-way video, email, smartphones, wireless tools, and other forms of telecommunications technology.
HD video conferencing	Two-way interactive HD video communication is delivered using Internet technologies that allow people at different locations to come together for a meeting.
Ultra HD video streaming	This app delivers Ultra HD video without the need to download files of different video formats using computer servers connected to the Internet to access information.
Virtual reality (VR) streaming	Streaming of realistic and immersive simulation of a three-dimensional environment, created using interactive software and hardware, and experienced or controlled by movement of the body or as an immersive, interactive experience generated by a computer.
High-frequency stock trading	These apps support the rapid turnover of positions through the use of sophisticated trading algorithms, which process hundreds of trades in fractions of a second on the basis of changing market conditions.
Connected vehicles safety applications	These apps involve the development and deployment of a fully connected transportation system that makes the most of multimodal, transformational applications requiring a combination of well-defined technologies, interfaces, and processes that, combined, help ensure safe, stable, interoperable, reliable system operations that minimize risk and maximize opportunities.

The
LAST
GENERATION

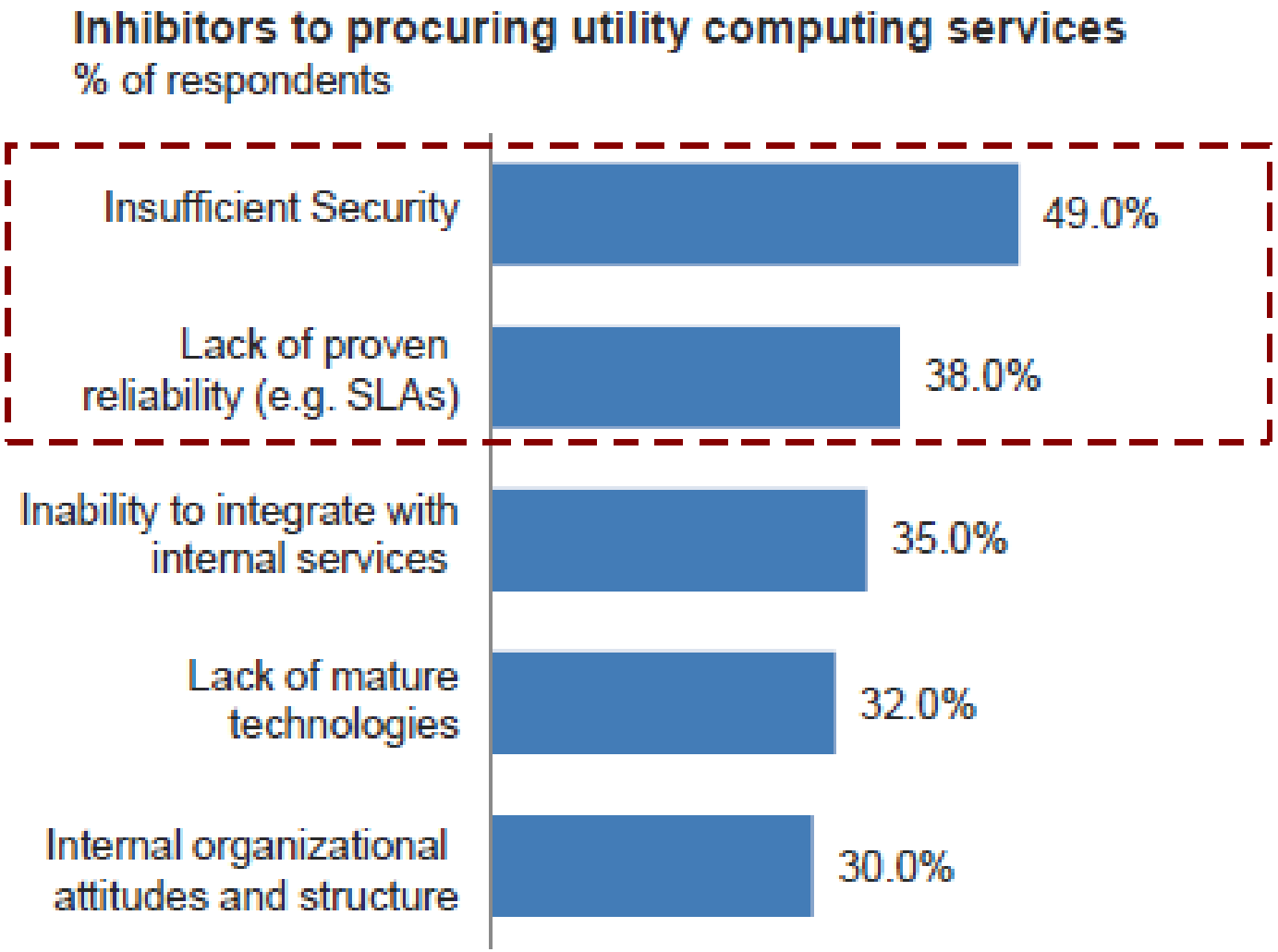
Cloud computing: what?



Cloud computing: enablers



Cloud computing: barriers



Connectivity: what is it?

How does Kevin Ashton define IoT?

"The Internet of Things' means sensors connected to the Internet and behaving in an Internet-like way by making open, ad hoc connections, sharing data freely and allowing unexpected applications, so computers can understand the world around them and become humanity's nervous system."

Kevin Ashton, from 'Making Sense of IoT'

Connectivity: what is it?

The Internet of Things (IoT) refers to machine-to-machine (M2M) technology enabled by secure network connectivity and cloud infrastructure, to reliably transform data into useful information for people, businesses, and institutions.

You've probably seen all kinds of innovative new applications and devices that promise to enable the connected home and vehicle, smart city and lifestyle, but how do you define what's IoT and what's not? We believe that for a solution to be considered a part of the Internet of Things it should demonstrate the "Three As":

AWARE

A connected asset must be able to sense something about its surroundings, this might be location, proximity, altitude, temperature, vibration, humidity, light levels, or motion. If it doesn't sense something, it's not IoT.

AUTONOMOUS

The data processed from a connected asset must be transferred to a central location or processing application automatically — either at a set time, or when a condition is met or a threshold passed. Without connectivity, it's not IoT.

ACTIONABLE

IoT isn't just about gathering data; it's about using it to make better decisions — that's the value of IoT. Regardless of whether the output is manual or highly automated, analysis of the data must be integrated into business processes. If the data is not actionable, by you or a third party, it's not IoT.

Connectivity: why now?

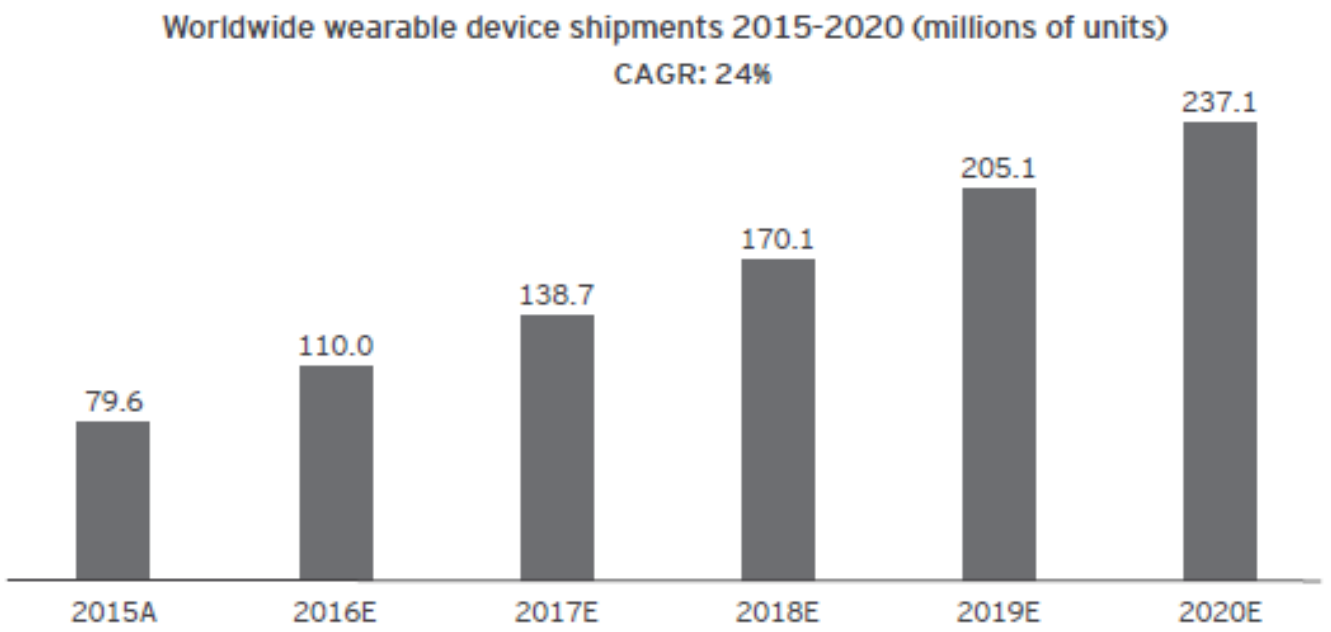
Key obstacles are gone: the cost of connectivity has declined at the same time that new ways to analyze mountains of data have developed

Why now? Enablers of the IoT

A number of significant technology changes have come together to enable the rise of the IoT. These include the following.

- **Cheap sensors** – Sensor prices have dropped to an average 60 cents from $1.30 in the past 10 years.
- **Cheap bandwidth** – The cost of bandwidth has also declined precipitously, by a factor of nearly 40X over the past 10 years.
- **Cheap processing** – Similarly, processing costs have declined by nearly 60X over the past 10 years, enabling more devices to be not just connected, but smart enough to know what to do with all the new data they are generating or receiving.
- **Smartphones** – Smartphones are now becoming the personal gateway to the IoT, serving as a remote control or hub for the connected home, connected car, or the health and fitness devices consumers are increasingly starting to wear.
- **Ubiquitous wireless coverage** – With Wi-Fi coverage now ubiquitous, wireless connectivity is available for free or at a very low cost, given Wi-Fi utilizes unlicensed spectrum and thus does not require monthly access fees to a carrier.
- **Big data** – As the IoT will by definition generate voluminous amounts of unstructured data, the availability of big data analytics is a key enabler.
- **IPv6** – Most networking equipment now supports IPv6, the newest version of the Internet Protocol (IP) standard that is intended to replace IPv4. IPv4 supports 32-bit addresses, which translates to about 4.3 billion addresses – a number that has become largely exhausted by all the connected devices globally. In contrast, IPv6 can support 128-bit addresses, translating to approximately 3.4×10^{38} addresses – an almost limitless number that can amply handle all conceivable IoT devices.

Connectivity: the landscape



Source: "Worldwide Wearable Device Forecast, 2015Q4", "IDC Forecasts Worldwide Shipments of Wearables to Surpass 200 Million in 2019, Driven by Strong Smartwatch Growth and the Emergence of Smarter Watches," *International Data Corporation (IDC) website*, March 17, 2016, https://www.idc.com/getdoc.jsp?containerId=prUS41100116.

Connectivity: the landscape

Here's how M2M connections on our network increased from 2013 to 2014 by sector:

Manufacturing	204%
Finance & Insurance	128%
Media & Entertainment	120%
Home Monitoring	89%
Retail & Hospitality	88%
Transportation & Distribution	83%
Energy & Utilities	49%
Public Sector/Smart Cities	46%
Healthcare & Pharma	40%

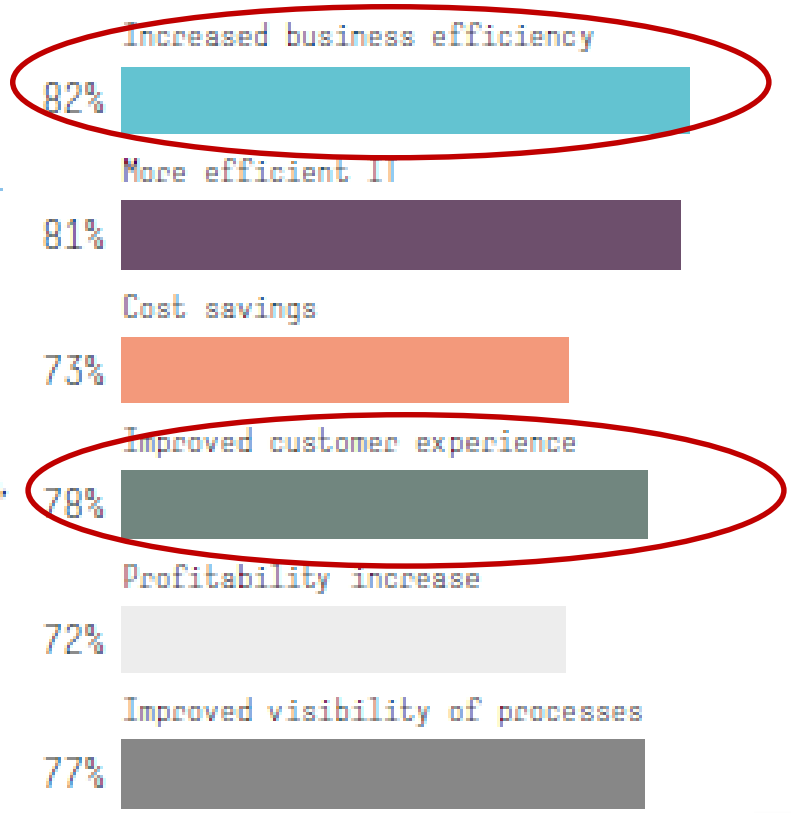
Connectivity: the benefits

Across the globe, the average return on investment from IoT was 34 percent. Over a quarter of respondents (27 percent) reported more than 40 percent ROI from IoT, and one in ten reported over 60 percent returns.

Just some of the areas IoT is helping transform:

- 82 percent said they had seen an increase in business efficiency since adopting IoT technology
- 81 percent have seen their organization's IT become more efficient
- 73 percent have achieved cost savings
- 78 percent saw an improvement in customer experience
- 72 percent declared a profitability increase
- 77 percent have seen improved visibility of processes across the whole organization

Commenting on the business outcomes they hoped to see in the future, business leaders also said they expected IoT to increase workplace productivity (56 percent), reduce downtime (40 percent) and create new business models through analytics-driven services (36 percent).



Connectivity: the value

The IoT value proposition – a driver of new product cycles and another leg of cost efficiencies

- **Revenue generation** – Companies are focused on the IoT as a driver of incremental revenue streams based on new products and services. For example, since the beginning of the year AT&T has introduced a Connected Car service in partnership with a number of automobile manufacturers, including Audi, GM, Tesla and Volvo, which offer high-speed 3G or 4G connections for a monthly subscription fee of $10. By the end of 2014, 30 of GM's 2015 vehicle models will have LTE support, enabling vehicles to act as a Wi-Fi hotspot with connectivity for up to 7 devices, as well as access to OnStar for remote vehicle access, diagnostics and emergency service.

Case study: Verizon saves 55 million kWh of electricity through IoT application

- **Productivity and cost savings** – Businesses are also embracing the IoT to improve productivity and save costs, such as capex, labor, and energy. For example, Verizon is saving more than 55 million kWh annually across 24 data centers by deploying hundreds of sensors and control points throughout the data center, connected wirelessly. The result is a reduction of 66 million pounds of greenhouse gases per year.

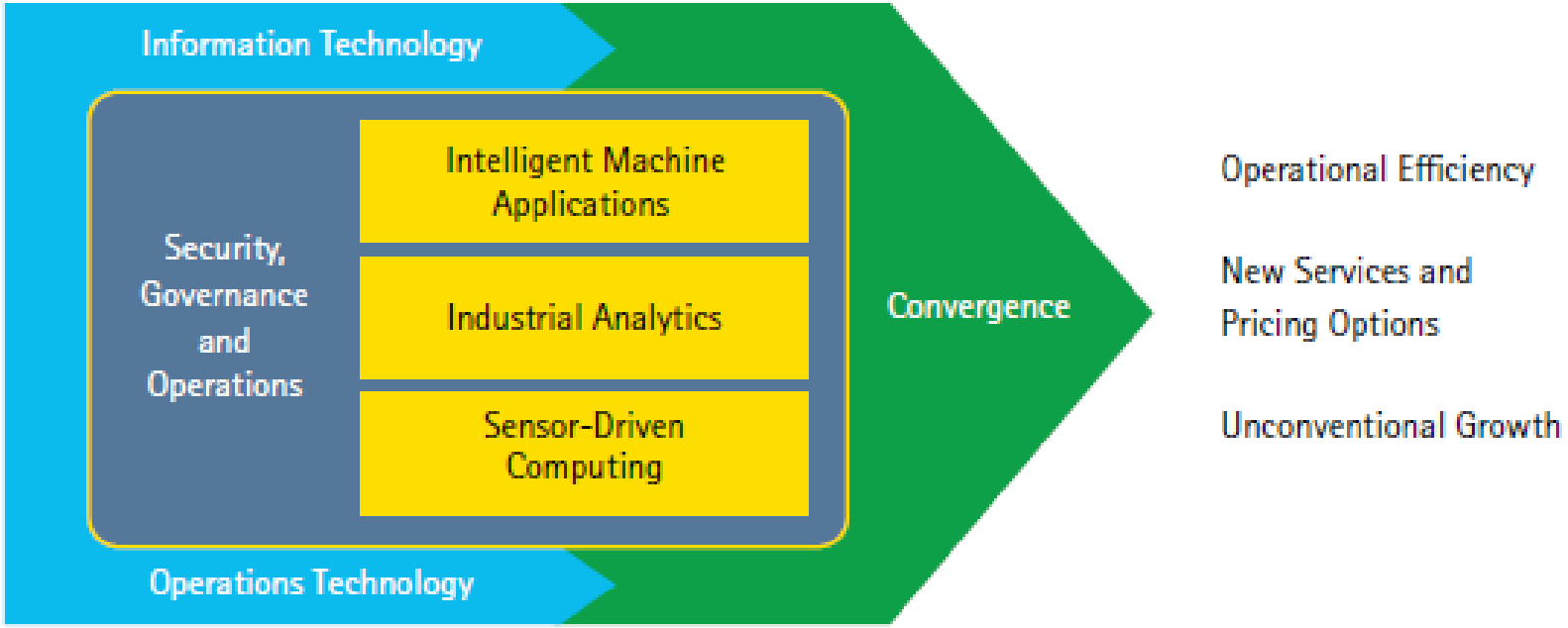
Connectivity: the strategy

What does a good Internet of Things strategy include?

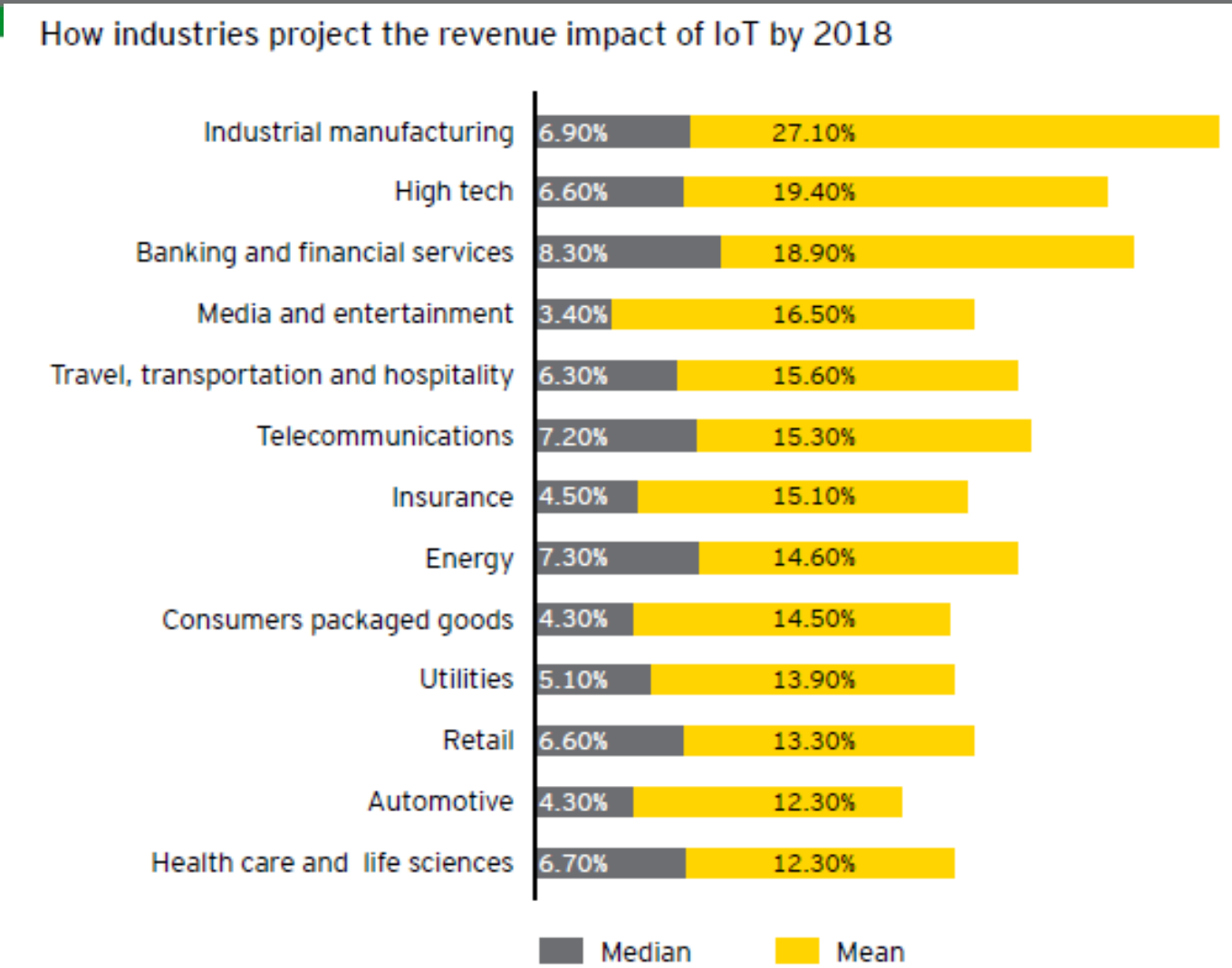
"One of the most important things is a robust plan for keeping your system secure. Eighty-four percent of Internet of Things adopters say they have experienced at least one Internet of Things security breach, with malware, spyware, and human error being the most common problems. Ninety-three percent of executives expect Internet of Things security breaches to occur in the future".

Kevin Ashton.

Leveraging connectivity

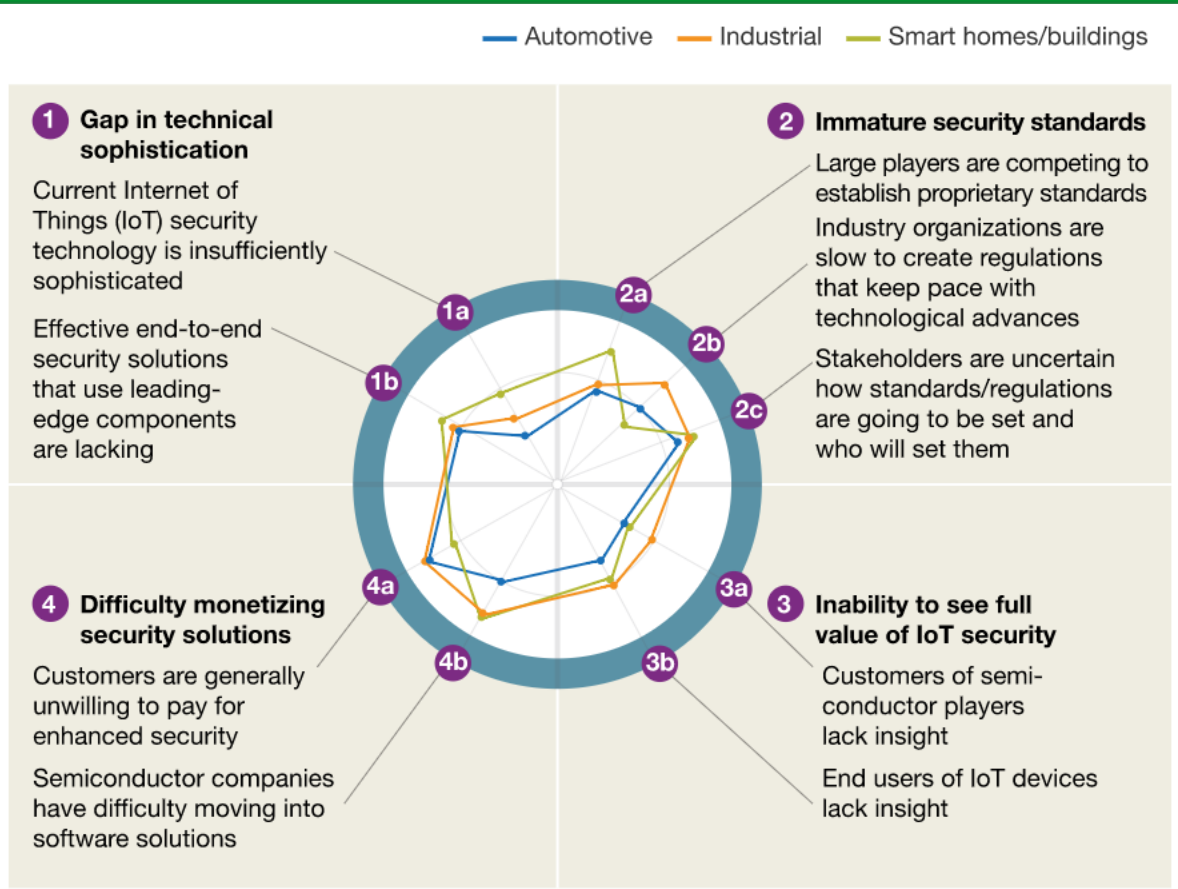


Connectivity: industry impact



Source: *Internet of Things: The Complete Reimaginative Force*, conducted by Research Now, Tata Consultancy Services, 22 July 2015, as cited by eMarketer.

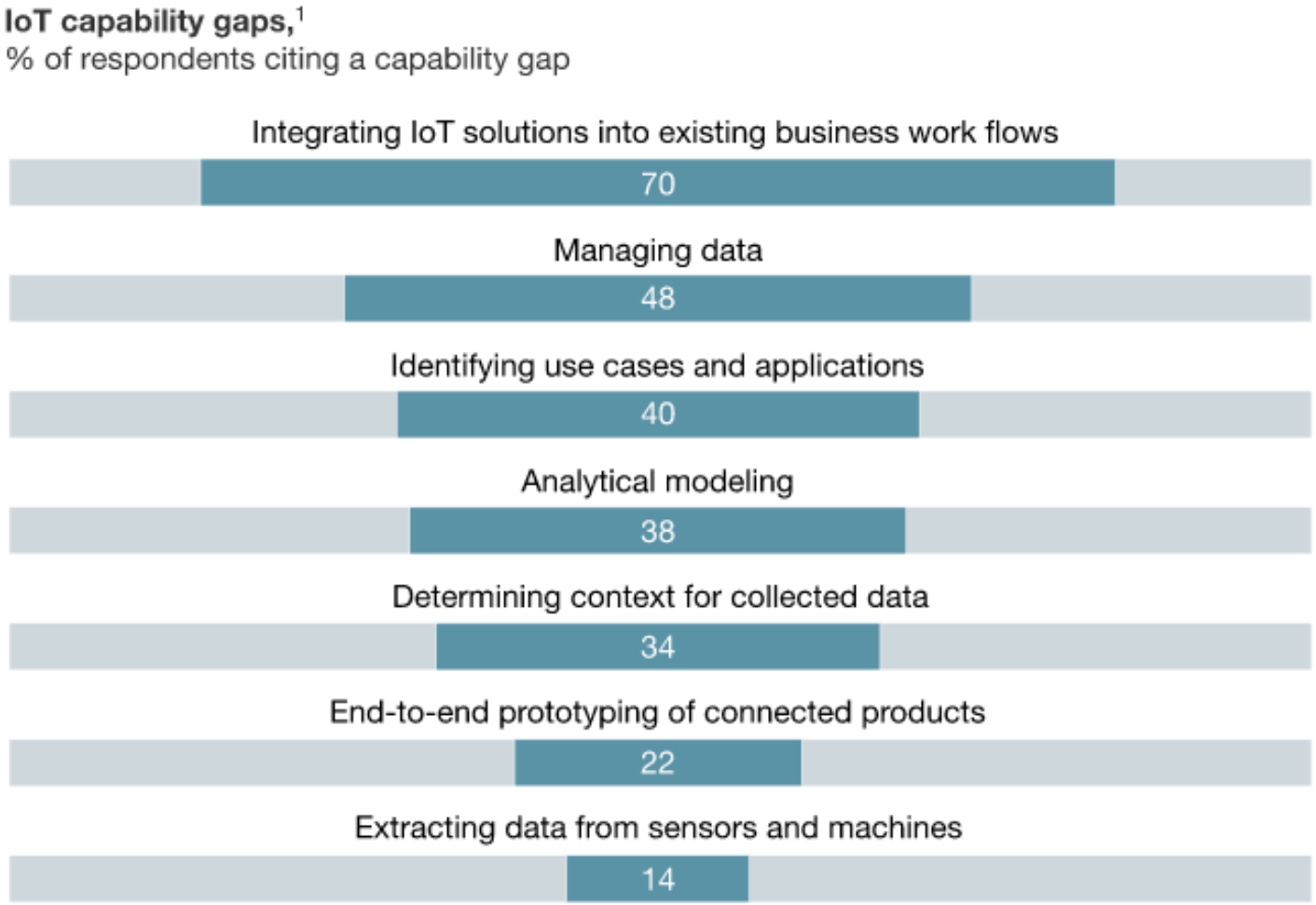
Connectivity: challanges



[1]4-point scale where 0 = not challenging/irrelevant, 3 = most challenging/relevant. Center scaled to 1 in graphic.

McKinsey&Company | Source: McKinsey/GSA Semiconductor Industry Executive Survey

Connectivity: competencies gap

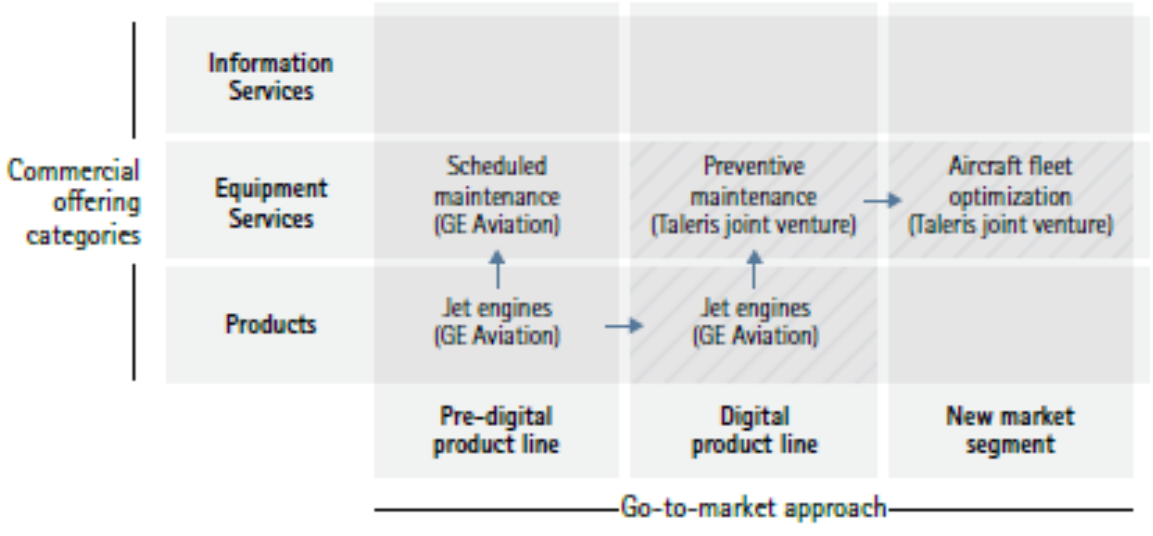


[1]Respondents were asked, "What are the greatest capability gaps related to the enterprise IoT for a company of your size in your industry?" (n = 50; respondents could select up to 3 gaps).

Connectivity: actual examples

General Electric

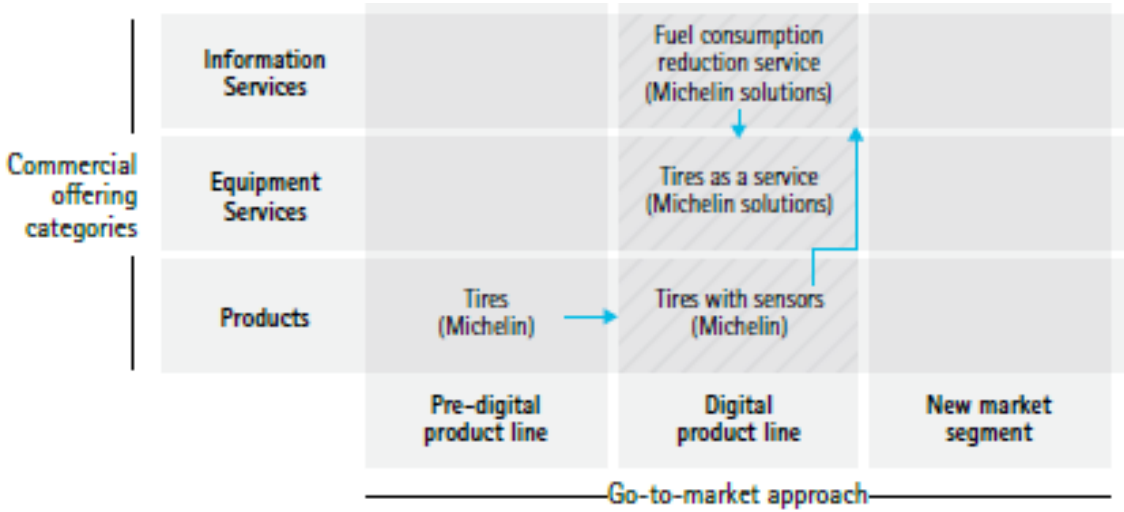
General Electric's aircraft engine maintenance business, born out of its jet engine business, is now moving to preventive maintenance and expanding into aircraft fleet optimization.



Connectivity: actual examples

Michelin

Michelin is helping truck fleet managers reduce fuel consumption and costs and allowing them to pay for tires on a kilometers-driven basis.

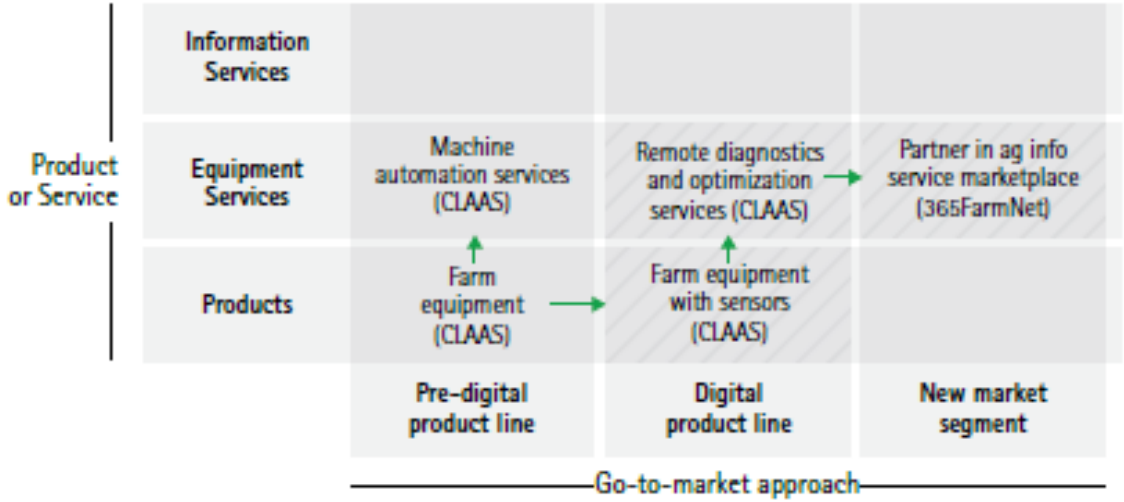


MICHELIN

Connectivity: actual examples

CLAAS

Farmers can operate CLAAS equipment on autopilot, receive advice on how to improve crop flow and minimize grain losses, or automatically optimize equipment performance. The company is now partnering with other organizations to provide information services to growers via a marketplace called 365FarmNet.

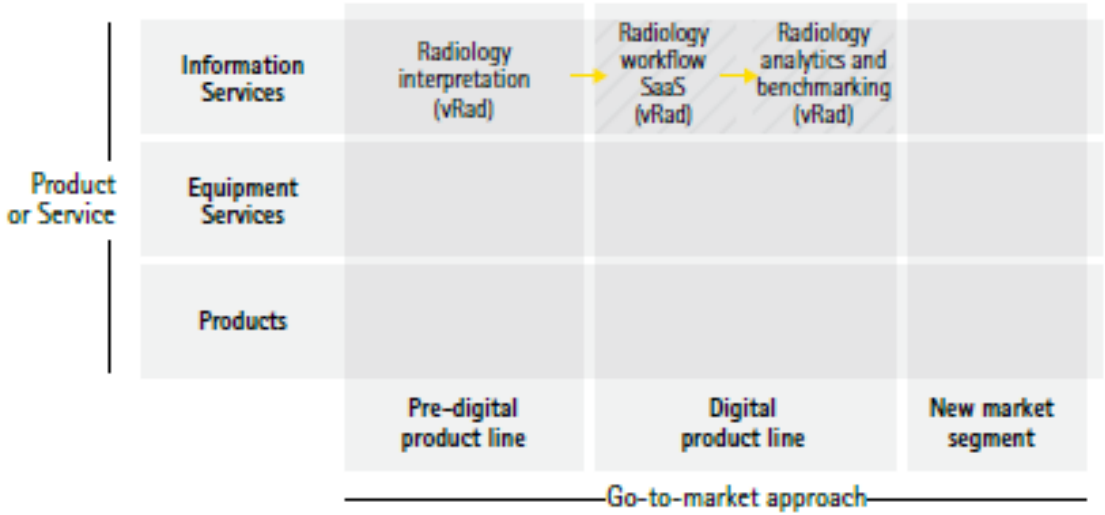


CLAAS

Connectivity: actual examples

Virtual Radiologic

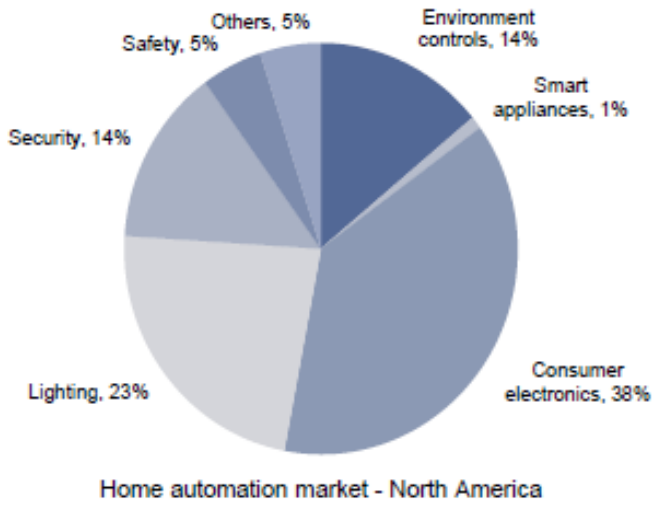
vRad began life as an X-ray interpretation service. It has since expanded into the IT services business, offering software services business and more recently an analytics service.



vRad®
a MEDNAX® Company

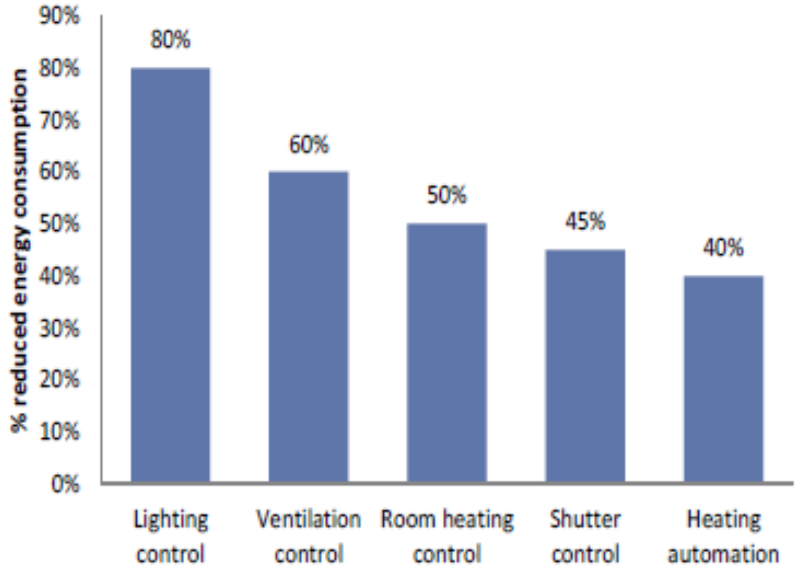
Connectivity: energy efficiency

Exhibit 7: Energy efficiency, home comfort and security will be key areas of Industrial focus



Source: ABB, Goldman Sachs Global Investment Research

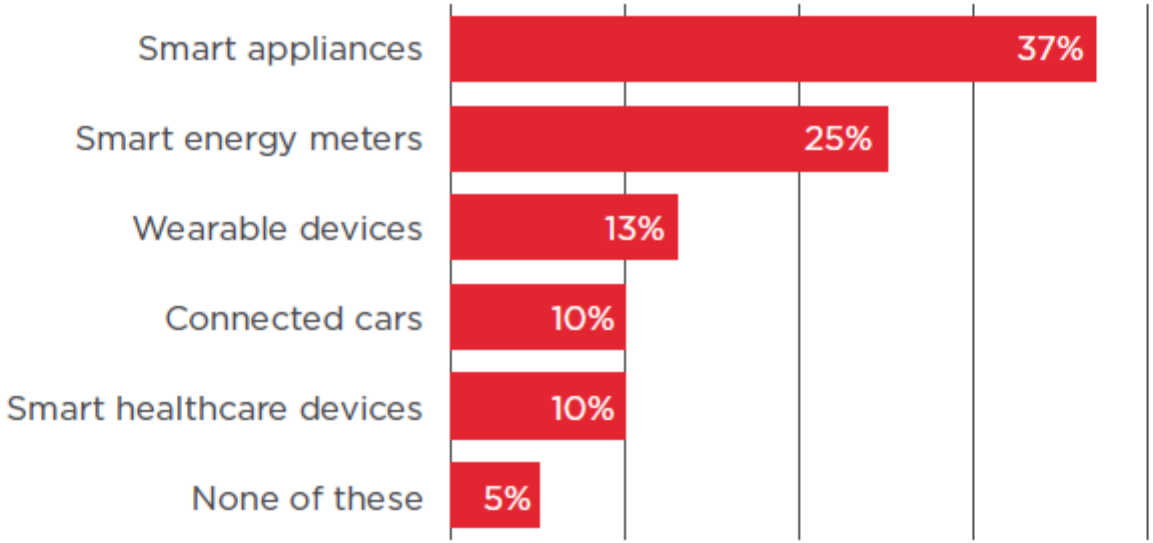
Exhibit 8: IoT can help reduce home energy consumption by over 40% in various applications



Source: Goldman Sachs Global Investment Research.

Connecting home

Which connected device are you most likely to use in the next five years?



Source: KRC Survey, n=2000

Source: KRC Survey, n=2000

Connecting life

2012	2017	2022
2 smartphones	4 smartphones	4 smartphones
2 laptops/computers	2 laptops	2 laptops
1 tablet	2 tablets	2 tablets
1 DSL/Cable/Fibre/Wifi Modem	1 connected television	3 connected television
1 printer/scanner	2 connected set-top boxes	3 connected set-top boxes
1 game console	1 network attached storage	2 eReaders
	2 eReaders	1 printer/scanner
	1 printer/scanner	1 smart metre
	1 game console	3 connected stereo systems
	1 smart metre	1 digital camera
	2 connected stereo systems	1 energy consumption display
	1 energy consumption display	2 connected cars
	1 Internet connected car	7 smart light bulbs
	1 pair of connected sport shoes	3 connected sport devices
	1 pay as you drive device	5 internet connected power sockets
	1 network attached storage	1 weight scale
		1 eHealth device
		2 pay as you drive devices
		1 intelligent thermostat
		1 network attached storage
		4 home automation sensors

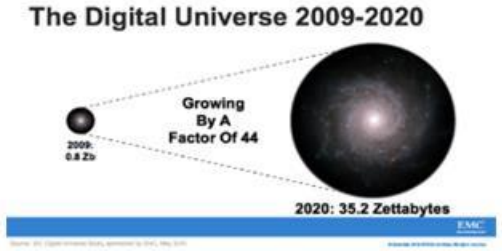
Big data: what they are?

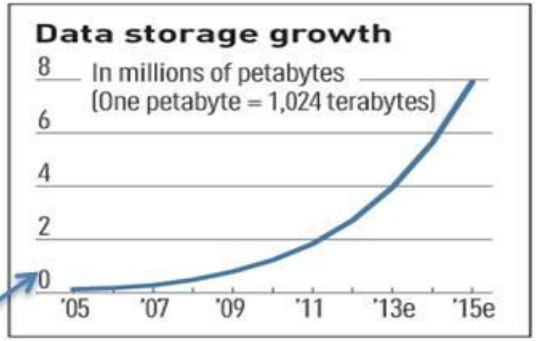
Big data: what they are?

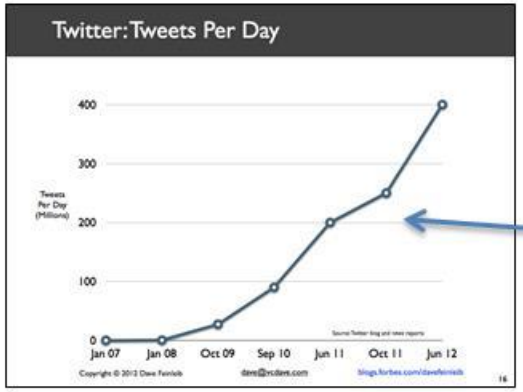
- **Volume:** the amount of data being created is vast compared to traditional data sources
- **Variety:** data comes from different sources and is being created by machines as well as people
- **Velocity:** data is being generated extremely fast – a process that never stops, even while we sleep
- **Veracity:** big data is sourced from many different places, as a result you need to test the veracity/quality of the data

Big data: volume

- **Data Volume**
  - 44x increase from 2009 2020
  - From 0.8 zettabytes to 35zb
- Data volume is increasing exponentially

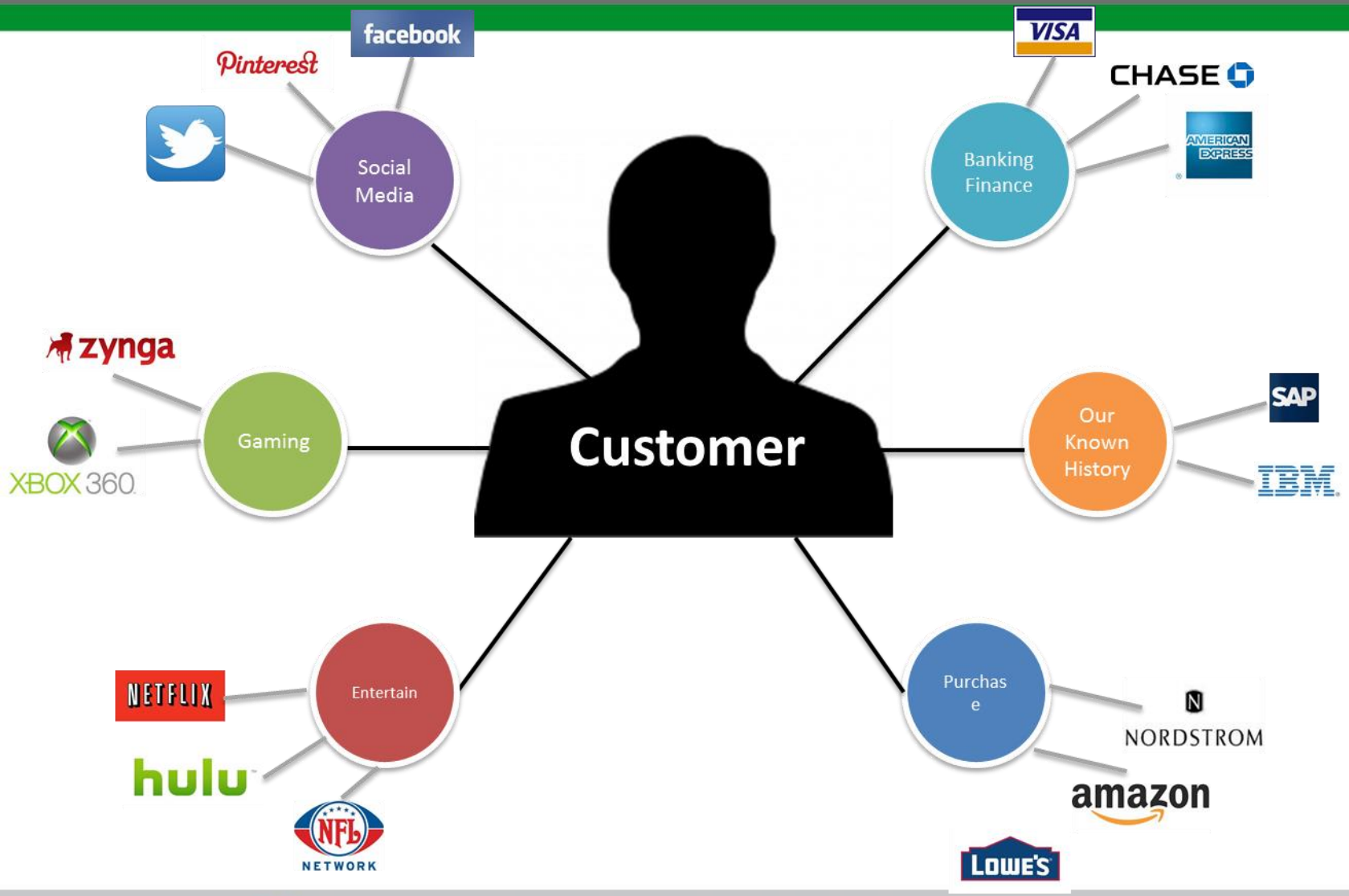






Exponential increase in collected/generated data

Big data: variety



Big data: velocity

- Data is begin generated fast and need to be processed fast
- Online Data Analytics
- Late decisions ➔ missing opportunities

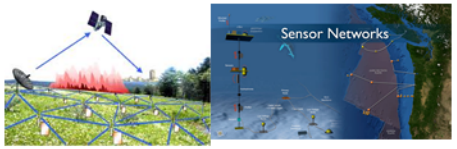
- **Examples**
  - **E-Promotions:** Based on your current location, your purchase history, what you like ➔ send promotions right now for store next to you
  - **Healthcare monitoring:** sensors monitoring your activities and body ➔ any abnormal measurements require immediate reaction

Big data: velocity

Social media and networks
(all of us are generating data)

Scientific instruments
(collecting all sorts of data)

Mobile devices
(tracking all objects all the time)



Sensor technology and networks
(measuring all kinds of data)

- The progress and innovation is no longer hindered by the ability to collect data
- But, by the ability to manage, analyze, summarize, visualize, and discover knowledge from the collected data in a timely manner and in a scalable fashion

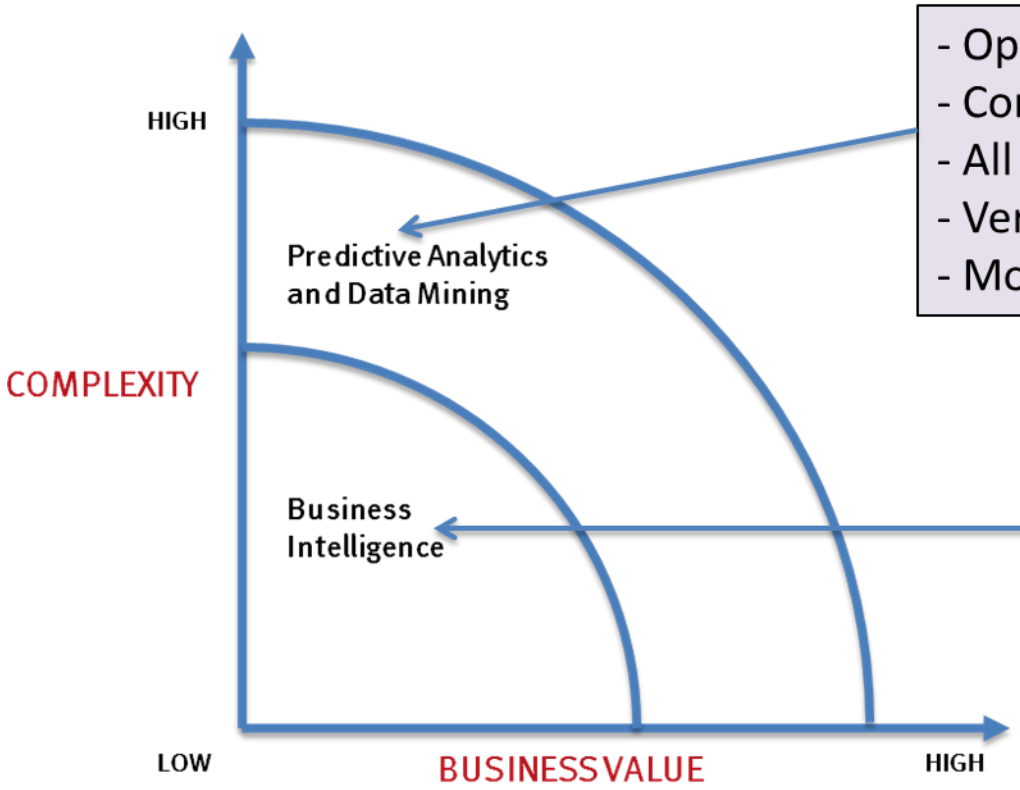
Big data: what is changing?

- **The Model of Generating/Consuming Data has Changed**

Old Model: Few companies are generating data, all others are consuming data

New Model: all of us are generating data, and all of us are consuming data

Big data: what is driving big data?



- Optimizations and predictive analytics
- Complex statistical analysis
- All types of data, and many sources
- Very large datasets
- More of a real-time

- Ad-hoc querying and reporting
- Data mining techniques
- Structured data, typical sources
- Small to mid-size datasets

Big data: where they come from?

Big data across sectors

Big data can generate significant financial value across sectors

US health care
- $300 billion value per year
- ~0.7 percent annual productivity growth

Europe public sector administration
- €250 billion value per year
- ~0.5 percent annual productivity growth

Global personal location data
- $100 billion+ revenue for service providers
- Up to $700 billion value to end users

US retail
- 60+% increase in net margin possible
- 0.5–1.0 percent annual productivity growth

Manufacturing
- Up to 50 percent decrease in product development, assembly costs
- Up to 7 percent reduction in working capital

SOURCE: McKinsey Global Institute analysis

Big data drivers

Governance

Good governance is vital to the success of Big data initiatives in any business; it encompasses consistent guidance, procedures and clear management decision-making. Organizations need to ensure standard and exhaustive data capture; they need not protect all the data, but they need to start sharing data with in-built protections with the right levels and functions of the organization.

Benefits

The MIT Center for Digital Business states "When it comes to big data, the 'right' governance model depends on the maturity level of the organization regarding data driven decisions." It obviously also highly depends on if big data is used to create new business or to drive more sales.

To unleash the power of big data, first of all data must be available and made fit for sharing. When it comes to, for example, medical data, respect for privacy and trust is inevitable.

Standardization in governance structures, with an integrated combination of technical, organizational and legal measures and safeguards, will help to increase trust. This is especially important when integrating governmental, institutional "open" and company data.

An example of this in action is seen with a European association that aims to build up a big data services platform for the health sector in their local region. It's a unique collaboration between health institutions, government, education and knowledge institutions and major IT service providers, addressing both the clinical and research sides of the health sector.

The core solution is comprised of a "vendor neutral hub" – a platform that works independently of vendors and data "owners" – where data can be captured, safely and durably stored, processed and distributed and finally, shared, if permitted by the data owner. This may be the case when patients are being treated by multidisciplinary teams or having treatment in various locations, or for research purposes using large sets of anonymous data.

The framework offers solutions for the immediate need to access data, to substantially lower the cost of data storage and, more importantly, to do more with the rapidly growing amount of unstructured data.

Management

Integrating and moving data across the organization is traditionally constrained by data storage platforms such as relational databases or batch files with limited ability to process very large volumes of data, data with complex structure or without structure at all, or data generated or received at very high speeds.

Organizations need to start managing data through different sources, and integrating its usefulness via a range of technologies in the market.

Benefits

Big data overcomes traditional restraints in a cost-effective manner and opens opportunities to ingest, store and process data from new sources such as external social media data, market data, communications, interaction with customers via digital channels, etc.

By some estimates, more than 80% of the data within organizations is unstructured and unfit for traditional processing. Using big data will enable the processing of this unstructured data and increased system intelligence which can be used to improve performance in sales, increase understanding of customer needs, reinforce the internal risk management function, support marketing initiatives and enhance fraud monitoring.

Big data capability allows organizations to integrate multiple data sources with relatively low effort in a short timeframe. Combined with a lower cost of storage per gigabyte, this enables organizations to build, for example, a federated view of customers by shifting customer data from various separate business departments into a single infrastructure, and then to run consolidated analytics and reporting on it.

Big data technologies release organizations from the traditional accuracy vs. cost challenge by enabling them to store data at the lowest level of detail, keeping all data history under reasonable costs and with less effort.

Architecture

With big data, it has become possible to build an architecture which can integrate massive volumes of data in various formats and provide real-time analytics aimed at a consolidated customer view, or improved fraud detection and other similar business goals.

Data architecture should be prepared to break down internal silos, enabling the sharing of key data sets across the organization and to ensure that learnings are being captured and relayed across to the right set of people in the organization in a timely and accurate manner.

Benefits

Big data has brought a new paradigm to data architecture. In the past, data systems were built with a predetermined set of data requirements. In the Big Data world, data storage platforms are not restricted to a predefined rigid data model, and data systems are capable of handling all kinds of structured and unstructured data.

Integration of unstructured data in particular can lead to improved analytics and reporting. For example, a business goal of having a consolidated view of the customer profile across business functions and geographies is important for various reasons:

- To make the business decision making process more intelligent
- To enhance the monitoring of customer profiles for "red flags" (issues of concern or opportunity)
- To enable the company to offer more relevant services to their customers tailored to their specific needs

Traditionally, organizations struggled to achieve this goal because their customer data was lying in multiple systems and different file formats (PDFs, Word and Excel documents, charts, images, scans, videos, etc.): technology was seen as a limiting factor to integrate this scattered and massive data and meet the goal. Big data brings a solution to this by offering capabilities to integrate and analyze data coming from large variety of systems across the organization in an efficient and flexible manner.

Real-time fraud monitoring is a classic big data challenge, demanding the integration of large amounts of diverse, structured and unstructured high-velocity data that needs to be analyzed in near-real time to realize the benefits. A global payments technology company recently stated that it has made an improvement of 130% in identifying fraud for debit transactions and 175% improvement in cases of credit card transactions by using big data technologies authorization model.

Big data also offers additional capabilities such as deploying data storage/processing power over a grid of commodity hardware, with unconstrained scalability and flexibility to adapt to constantly changing data landscape.

Usage

The convergence of data availability and processing power is helping to unlock the potential of big data for most sectors and industries. The results of big data can beneficial to a wide range of stakeholders across the organization – executive management and boards, business operations and risk professionals, including legal, internal audit, finance and compliance; as well as customer-facing departments like sales and marketing.

The key challenge is having the ability to interpret the huge amount of data that can be collated from various sources.

Benefits

The weather used to be unforeseeable and ungovernable. Robust weather forecasts models usually require hundreds of thousands of atmospheric variables that are constantly changing. With big data, some technology companies have emerged with the ability to provide historical weather data and better forecasting of extreme weather events. Based on billions of calculations and data points over the past several decades, big data now makes it possible to improve weather predictions up to a month in advance.

With the advent of low-cost cloud computing environments and open data movements, various big data weather forecasting ventures have arisen in recent years. Some of those new start-ups provide their services to corporate users (e.g., large-scale farmers, logistic companies) and some to retail customers directly.

Accurate weather data is beneficial for many organizations; for example, some companies have been using weather information to improve their business activities ranging from supply chain planning to advertising.

Supply chain management goes beyond just stocking more shovels ahead of a snowstorm. Retailers can now improve inventory management by leveraging new big data insights showing, for example, that after unusually cool weather, beer sales will decrease in some cities while increasing in others. And, by combining real-time detailed analysis of current and historical weather data with personal data such as location, demographics and purchase history, retailers are able to further refine and target their advertisements; i.e., consumer purchase patterns will change if today is the first warm day after a week of cold temperatures.

Quality

The quality of data sets and the inference drawn from such data sets are increasingly becoming more critical and organizations need to build quality and monitoring functions and parameters for big data. For example, correcting a data error can be much more costly than getting the data right the first time – and getting the data wrong can be catastrophic and much more costly to the organization if not corrected.

Benefits

For many years the health care ecosystem has embraced big data. With the ability to capture every patient touch point, the amount of data within the health care ecosystem has exploded. The evolution of new data sources and the ability to mash that data with existing data sources is evolving – big data is creating the possibility of new positive patient outcomes.

Some of these new data sources include the integration of disease registries, tissue registries and genomic information, and then aligning them with meaningful use clinical standards. It is defining key care treatment approaches based on new genetic insights and clinical protocol matching algorithms, and defining focused patient care treatment insights earlier within the care delivery process.

The value from these new big data insights will be priceless for the patient. The quality of the data will also have a direct effect on driving new key health care insights in creating high-quality outcomes while effectively managing costs.

Security

Security is a major concern with big data. To make more sense from the big data, organizations would need to start integrating parts of their sensitive data into the bigger data. To do this, companies would need to start establishing security policies which are self-configurable: these policies must leverage existing trust relationships, and promote data and resource sharing within the organizations, while ensuring that data analytics are optimized and not limited because of such policies.

Benefits

With the rapid adoption of smartphone and wearable technology, organizations are increasingly taking advantage of the new medium (e.g., developing their own apps, partnering with a third-party app, or purchasing advertising space within a third-party app) in which to reach out to customers to increase their revenue.

For example, health and fitness organizations have developed mobile apps that utilize the GPS function of a smartphone and motion/accelerometer to determine where you are, plot your route on a map, show your running speed, etc. Some organizations have also developed software coupled with wearable technology that monitors your sleeping patterns.

Other location-based apps are selling GPS-based advertising within their application. This, for example, can enable retail organizations to target product offers, and offer discounts to consumers within the given radius of the retail store.

In order for this type of data to be useful, it needs to be linked to an entity. The linkage may be to a user account that identifies a person directly, or a device that may be traced to a person. The collection and aggregation of this type of information increasingly exposes an individuals' information. Maintaining security over this data is integral to building consumer trust and fostering continued usage.

Privacy

Organizations have traditionally used various methods of de-identification (anonymization, encryption, pseudonymization, key-coding, data sharding, etc.) to distance data from real identities and allow analysis to proceed while at the same time containing privacy concerns.

The increased use of big data challenges the traditional frameworks for protecting the privacy of personal information, forcing companies to audit the implementation of their privacy policies to ensure that privacy is being properly maintained.

Benefits

Automobiles have evolved from purely mechanical machines to sophisticated mobile platforms that host a variety of computer, sensors and GPS and communications devices.

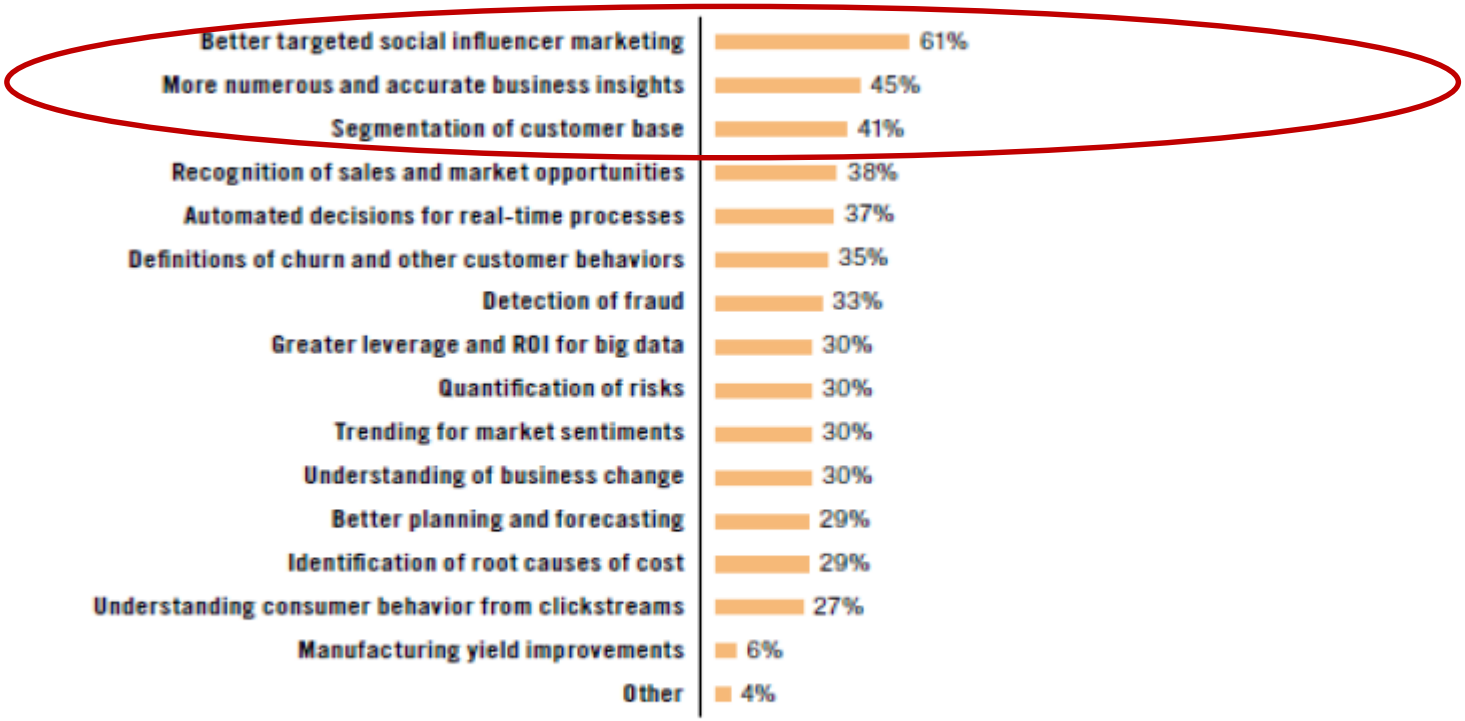
The use of sensor and location data in the automotive industry has increased tremendously in the past few years. Services such as subscription-based communication and navigation systems provide safety and convenience to users and new revenue streams for companies. The ability to view car status such as fuel level and tire pressure on a smartphone, track a stolen vehicle or summon assistance in case of accidents are all enabled by real-time collection and monitoring of location and sensor data.

Using crowd-sourced real-time location information, mapping apps and GPS units provide more accurate traffic and drive-time information, and by analyzing the commute patterns of tens of millions of drivers, actual drive times to and from work can now be factored into home purchase decisions.

Even telematics information such as braking and cornering force is being combined with data, such as when you drive (e.g., after midnight) and how often the speed limit is exceeded, in order to determine personalized auto insurance premiums.

Main benefits

Which of the following benefits would ensue if your organization implemented some form of big data analytics? (Select five or fewer.)



Business benefits received by implementing an effective Big Data methodology. The survey is based on 1153 responses from 325 respondents

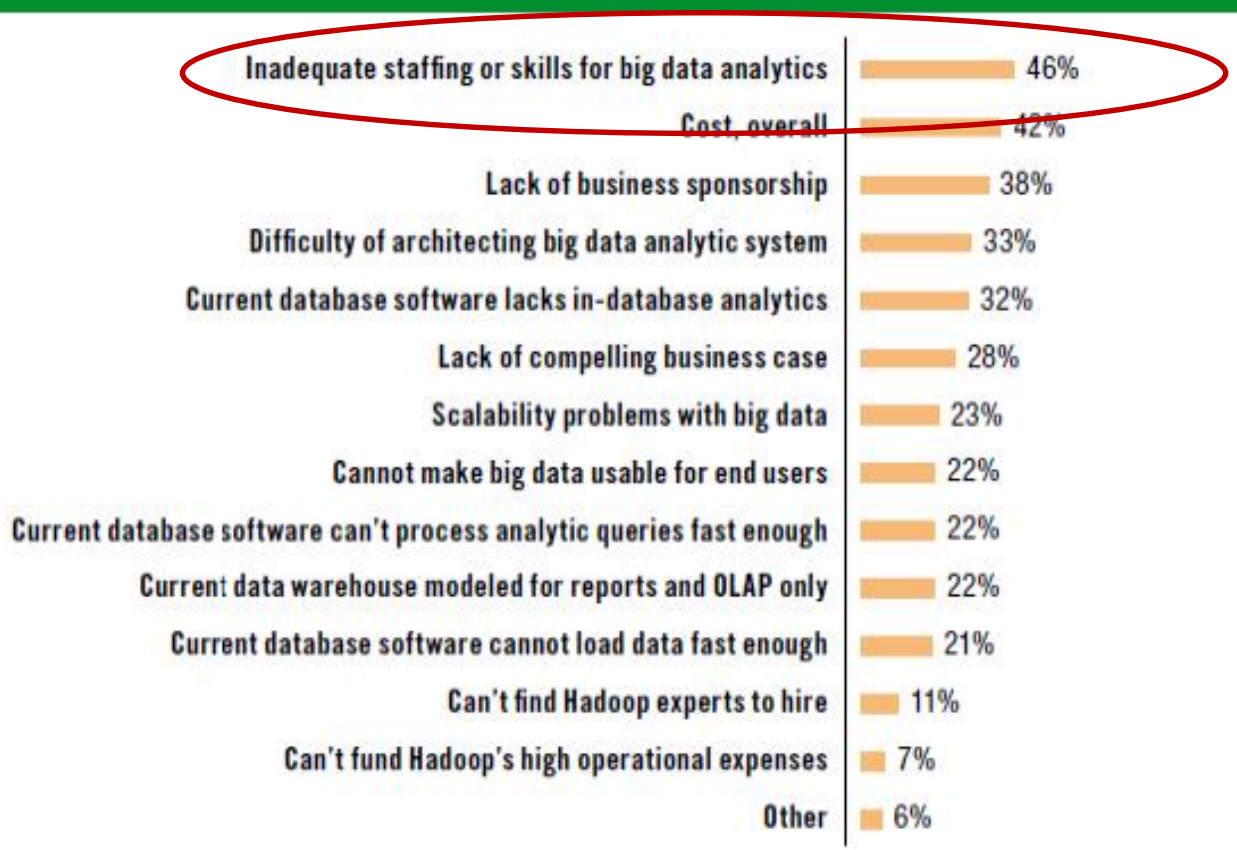
Big data analyses

- What does it mean *knowledge*?

Set of patterns implicitly available into data.

- What does it mean *interesting*?
  - **New:** something not known or uncommon knowledge
  - **Implicit:** not immediately accessible
  - **Potentially useful:** for tacking decisions
  - **Understandable:** from humans

Main challanges



Main challenges between Big Data and companies. The survey is based on 1153 responses from 325 respondents

Where is most of the value?

	Data generation and collection	Data aggregation	Data analysis
Description	▪ The source and platform where data is initially captured	▪ Combining data from multiple sources ▪ Forming marketplaces for commercial exchange of data	▪ Manipulating aggregated data to develop actionable insights
Factors driving value up	▪ Certain data types will have higher value if collection barriers are extremely high or data cannot be legally shared between parties	▪ Demand growth as more applications are developed ▪ Value will be higher if aggregation is technically challenging or requires a neutral third party	▪ Talent shortage ▪ Deep sector expertise needed to deliver effectively ▪ Close relationship to actual use or implementation clarifies value
Factors driving value down	▪ Growth in available proxies and expansion of open access will increase supply	▪ Technology advances making aggregation easier	▪ Scope could be limited as solutions will be for "vertical" applications
Future trajectory of value			

Big data and customization

Data and analytics enablers

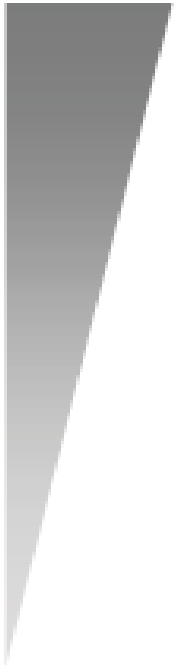
- Granular data enables finer levels of distinctions among individuals
- Outcomes and responses data allow businesses to estimate relationships between individual characteristics and improved value from customized goods/services

Industry preconditions

- The good or service has a differentiated value for each individual
- Mass customization creates possibility of meeting individual demands

Analytics will enable individually tailored products and services in these industries	
Health care	Tailoring interventions leads to precision wellness
Education	Individualized learning experiences based on existing skills, learning style, and interests
Labor market	Identifying an individual's skills and career goals to aid job matching and training
Travel and leisure	Customized travel experiences and recommendations
Media	Tailored and curated content
Retail	Shoppers directed to the right products for them at the right moment
Advertising	Ads targeted by time, location, and person to maximize potential sales

Matching complexity



For example…

Google closes $3.2 billion purchase of Nest!

A focus on blockchain

What is a Blockchain?

In essence, a blockchain is:

- A distributed ledger
- A consensus protocol
- A membership protocol

A focus on blockchain

How to track wealth (or anything)?

Things

- Gold, beads, cash...

Ledgers

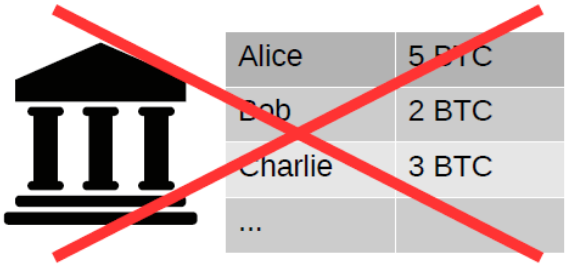
- Who owns what?

BANKING LEDGER				Account Number
DATE	DESCRIPTION	DEPOSIT	WITHDRAW	BALANCE

A focus on blockchain

Distributed Ledgers

Problem: we don't want to trust any designated, centralized authority to maintain the ledger



Alice	5 BTC
Bob	2 BTC
Charlie	3 BTC
...	

Solution: "everyone" keeps a copy of the ledger!

- Everyone checks everyone else's changes to it

Alice's copy

Alice	5 BTC
Bob	2 BTC
Charlie	3 BTC
...	

Bob's copy

Alice	5 BTC
Bob	2 BTC
Charlie	3 BTC
...	

Charlie's copy

Alice	5 BTC
Bob	2 BTC
Charlie	3 BTC
...	

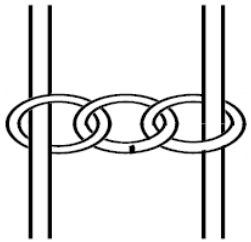
A focus on blockchain

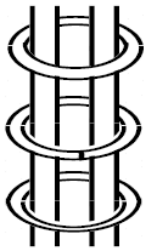
The Basic Goal: to Distribute Trust

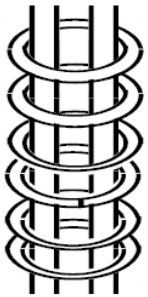
"weakest-link" security

"strongest-link" security in a small group

"strongest-link" security in a large group







A focus on blockchain

The Power of Distributed Ledgers

Can represent a distributed electronic record of:

- Who owns how much **currency**? (Bitcoin) 
- Who owns a name or a digital work of art? 
- What are the terms of a **contract**? (Ethereum) 
- When was a **document** written? (notaries)
- …

A focus on blockchain

Blockchains Require Consensus

Replicating a (fixed) ledger is actually easy…

- Decades-old technology: e.g., **gossip** protocols

But the participants must **agree** somehow on who gets to **extend** the blockchain, and how!

- Must reach a distributed **consensus** on all changes

Artificial intelligence: what is it?

AI (pronounced AYE-EYE) or artificial intelligence is the simulation of human intelligence processes by machines, especially computer systems

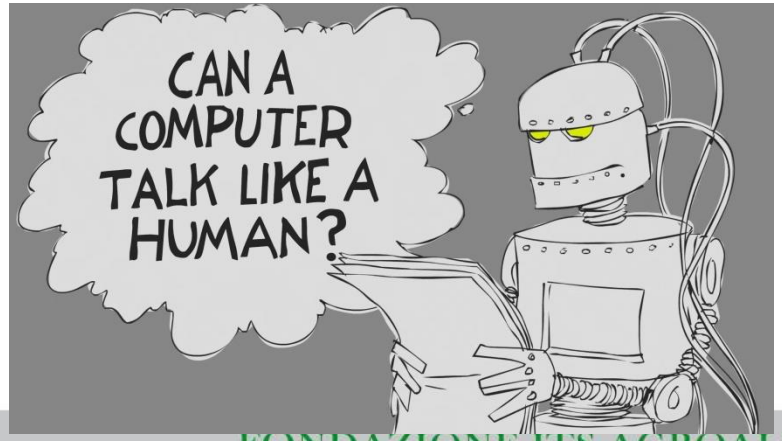
These processes include learning (the acquisition of information and rules for using the information), reasoning (using the rules to reach approximate or definite conclusions), and self-correction

Particular applications of AI include expert systems, speech recognition and machine vision

Types of artificial intelligence

Weak AI - also known as narrow AI, is an AI system that is designed and trained for a particular task. Virtual personal assistants, such as Apple's Siri, are a form of weak AI

Strong AI - also known as artificial general intelligence, is an AI system with generalized human cognitive abilities so that when presented with an unfamiliar task, it has enough intelligence to find a solution



Strong AI types

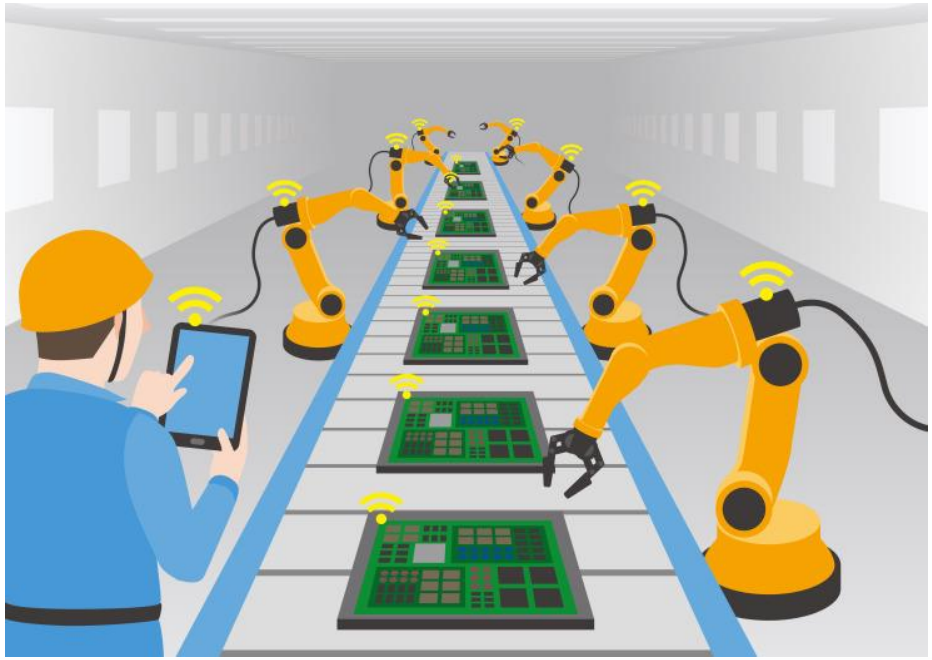
- **Reactive machines** - An example is Deep Blue, the IBM chess program that beat Garry Kasparov in the 1990s. Deep Blue can identify pieces on the chess board and make predictions, but it has **no memory** and cannot use past experiences to inform future ones

- **Limited memory** - These AI systems can **use past experiences** to inform future decisions. Some of the decision-making functions in autonomous vehicles have been designed this way

- **Self-awareness** - In this category, AI systems have a sense of self, have consciousness. Machines with self-awareness understand their **current state** and can use the information to infer what others are feeling

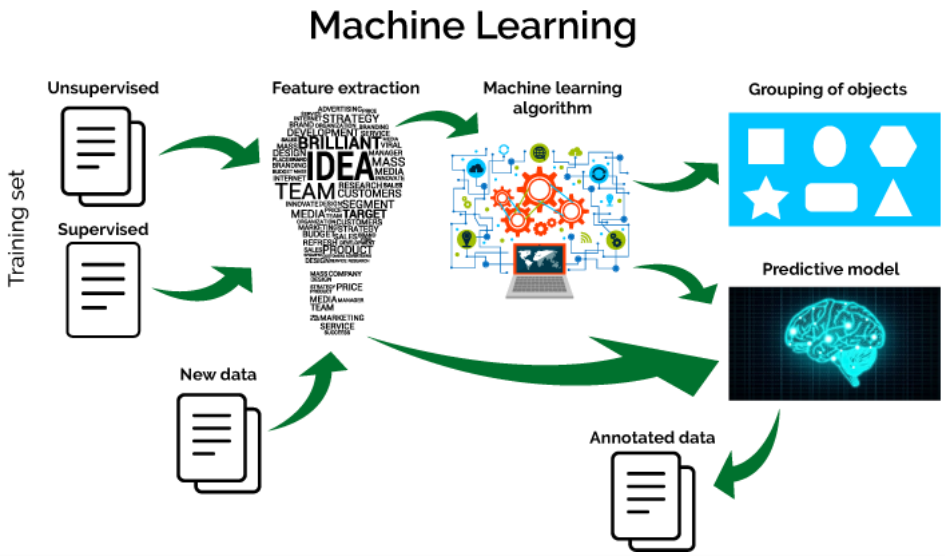
Strong AI types

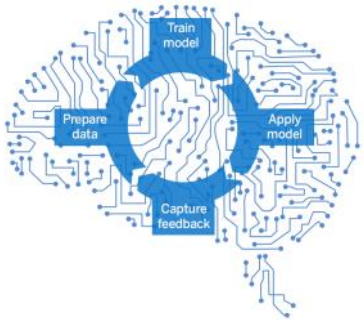
Automation - is the process of making a system or process function automatically. Robotic process automation, for example, can be programmed to perform high-volume, repeatable tasks normally performed by humans. RPA is different from IT automation in that it can adapt to changing circumstances



Strong AI types

Machine learning is the science of getting a computer to act without programming. Deep learning is a subset of machine learning that, in very simple terms, can be thought of as the automation of predictive analytics

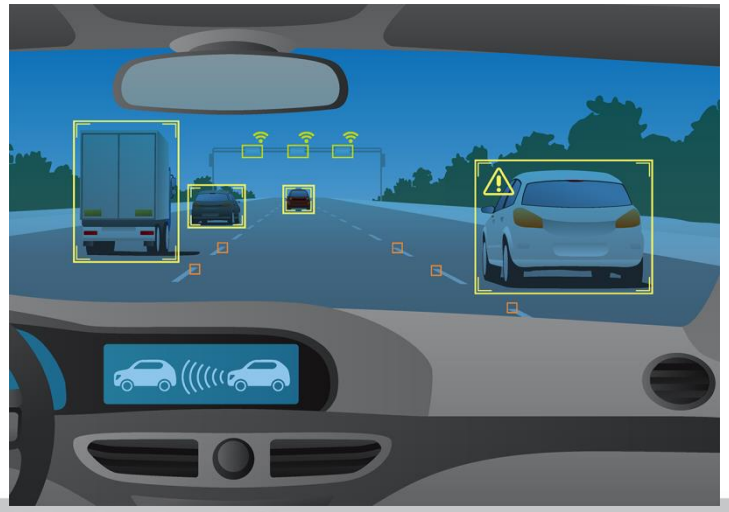




Strong AI types

Machine vision is the science of making computers see and captures and analyzes visual information using a camera, analog-to-digital conversion and digital signal processing

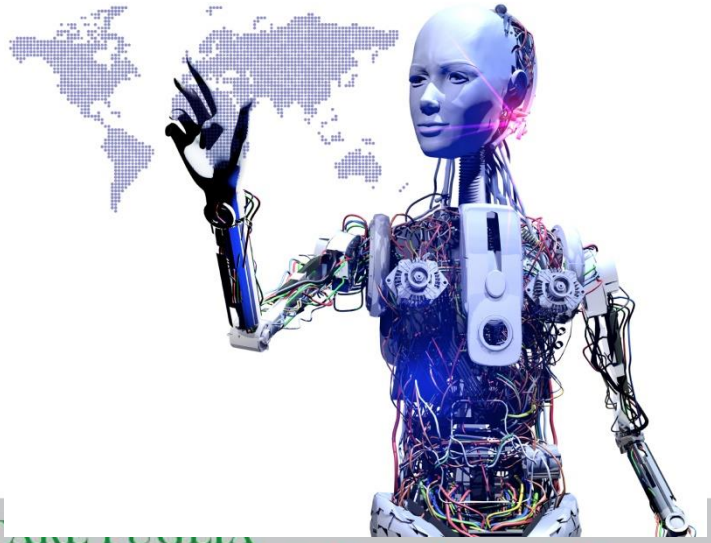
It is often compared to human eyesight, but machine vision isn't bound by biology and can be programmed to see through walls, for example. It is used in a range of applications from signature identification to medical image analysis



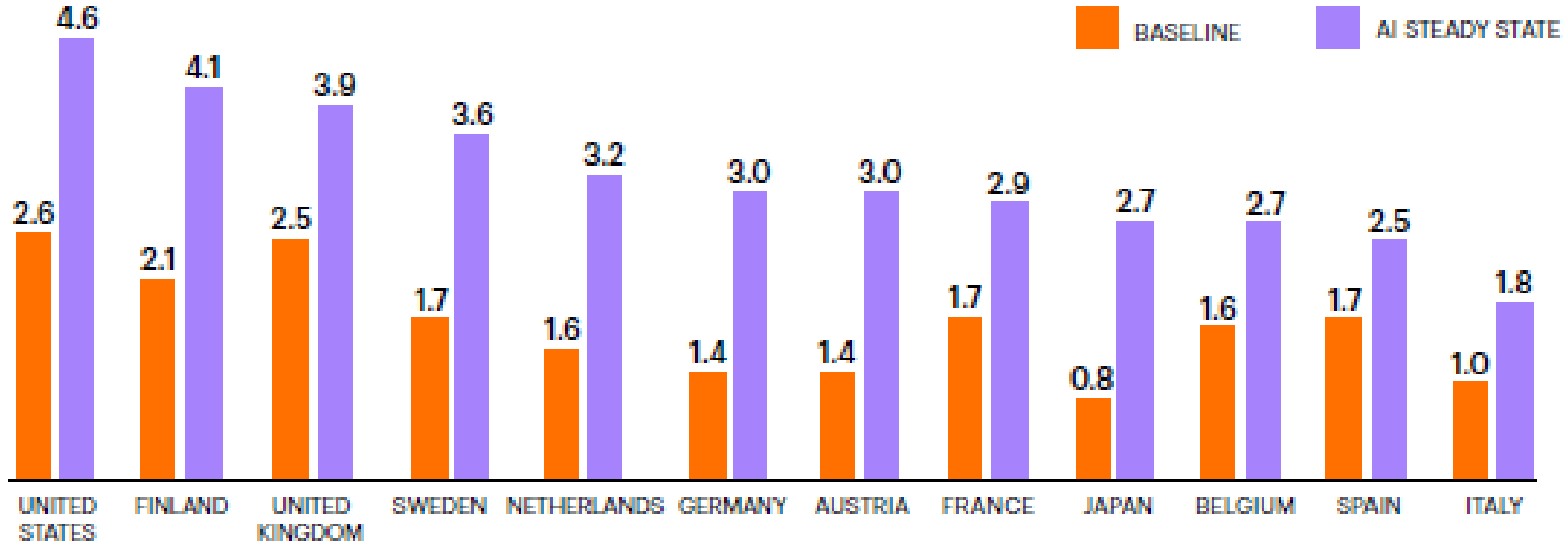
Strong AI types

Robotics is a field of engineering focused on the design and manufacturing of robots

Robots are often used to perform tasks that are difficult for humans to perform or perform consistently. They are used in assembly lines for car production or by NASA to move large objects in space. More recently, researchers are using machine learning to build robots that can interact in social settings



AI across countries

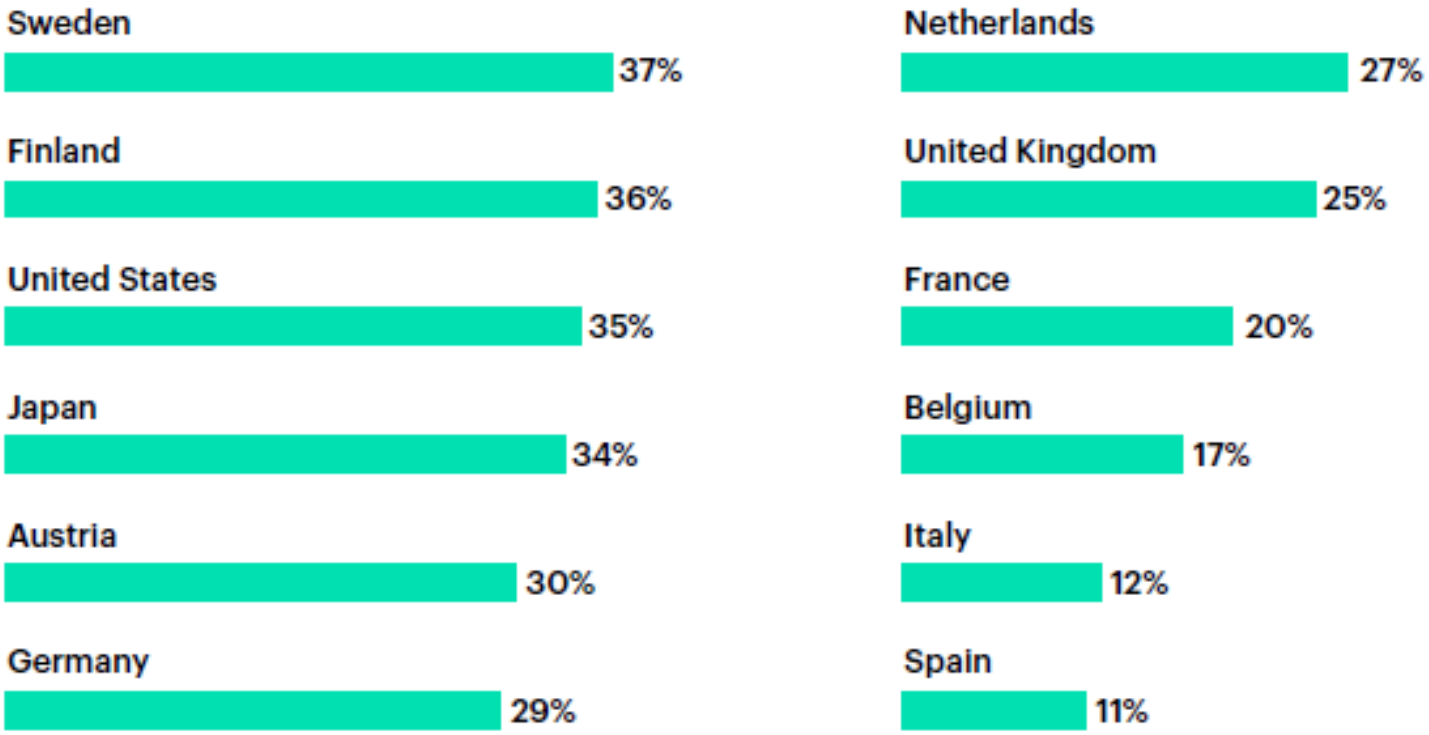


Real gross value added (GVA) (%, growth)

Source: Accenture and Frontier Economics

AI across countries – the impact on labor

Artificial intelligence promises to significantly boost the productivity of labor in developed economies.

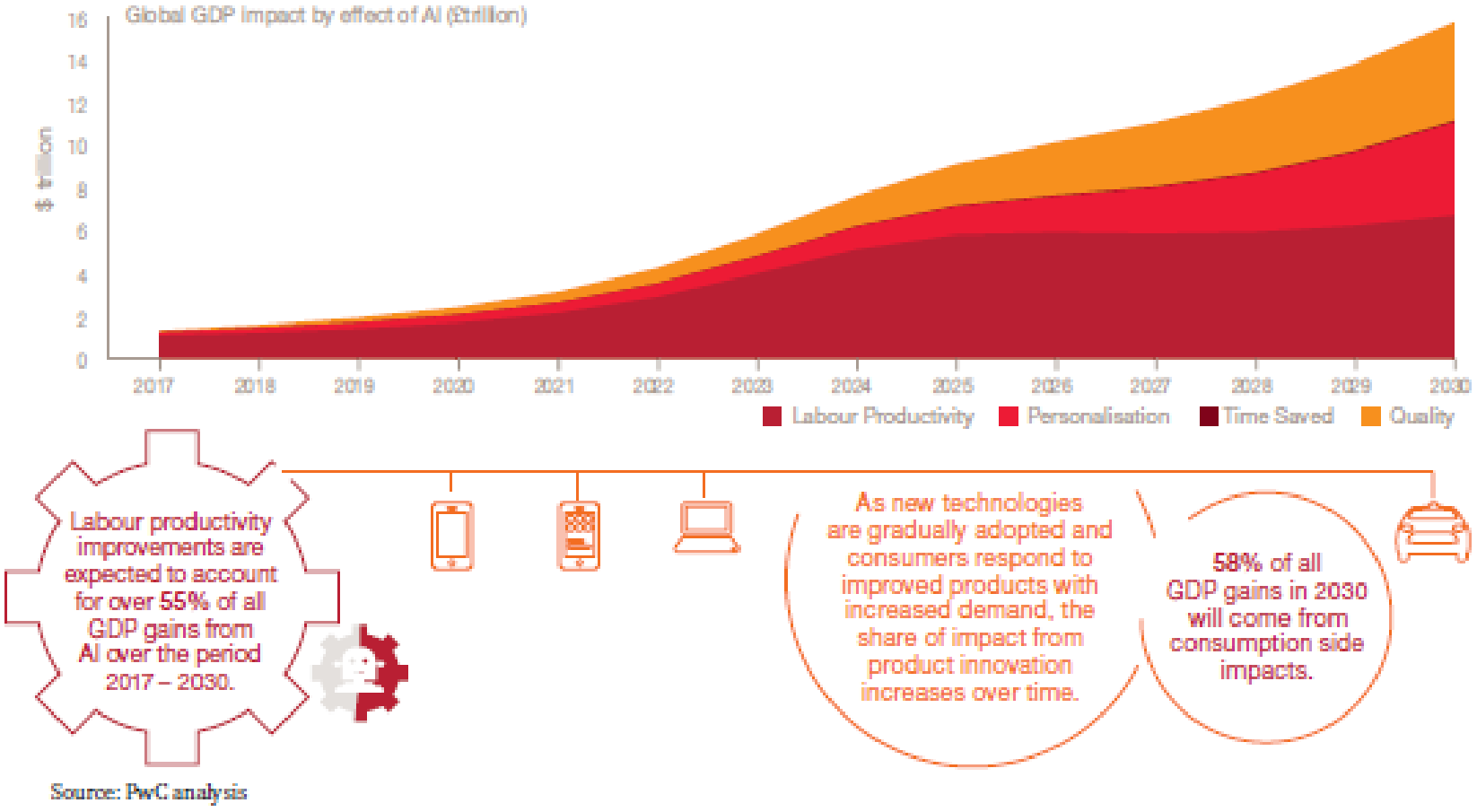


Percentage difference between baseline in 2035 and AI steady state in 2035

Source: Accenture and Frontier Economics

AI – the value

Figure 1: Where will the value gains come from with AI?



Source: PwC analysis

AI applications - healthcare

The biggest bets are on improving patient outcomes and reducing costs

Companies are applying machine learning to make better and faster diagnoses than humans. One of the best known healthcare technologies is IBM Watson. It understands natural language and is capable of responding to questions asked of it. The system mines patient data and other available data sources to form a hypothesis, which it then presents with a confidence scoring schema

Other AI applications include chatbots, a computer program used online to answer questions and assist customers, to help schedule follow-up appointments or aiding patients through the billing process, and virtual health assistants that provide basic medical feedback

AI applications - business

Robotic process automation is being applied to highly repetitive tasks normally performed by humans

Machine learning algorithms are being integrated into analytics and CRM platforms to uncover information on how to better serve customers. Chatbots have been incorporated into websites to provide immediate service to customers

Automation of job positions has also become a talking point among academics and IT consultancies such as Gartner and Forrester

AI applications - education

AI can automate grading, giving educators more time

AI can assess students and adapt to their needs, helping them work at their own pace. AI tutors can provide additional support to students, ensuring they stay on track

AI could change where and how students learn, perhaps even replacing some teachers

AI applications - finance

AI applied to personal finance applications, such as Mint or Turbo Tax, is upending financial institutions

Applications such as these could collect personal data and provide financial advice

Other programs, IBM Watson being one, have been applied to the process of buying a home. Today, software performs much of the trading on Wall Street

AI applications - law

The discovery process, sifting through of documents, in law is often overwhelming for humans

Automating this process is a better use of time and a more efficient process

Startups are also building question-and-answer computer assistants that can sift programmed-to-answer questions by examining the taxonomy and ontology associated with a database

AI applications - manufacturing

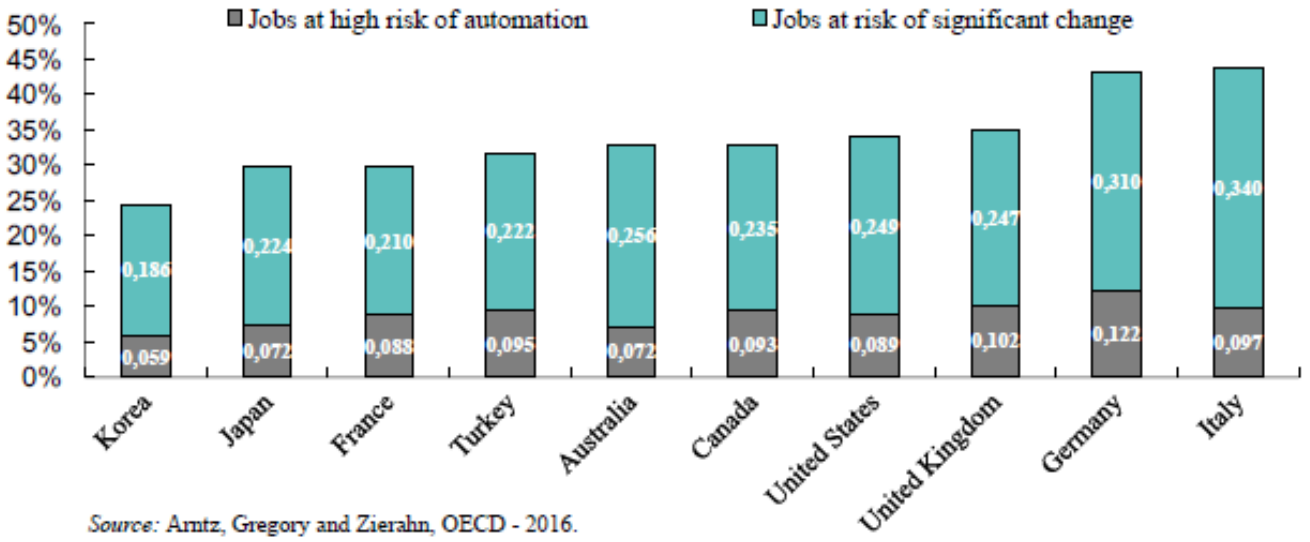
This is an area that has been at the forefront of incorporating robots into the workflow

Industrial robots used to perform single tasks and were separated from human workers, but as the technology advanced that changed

Digitalization and labor market

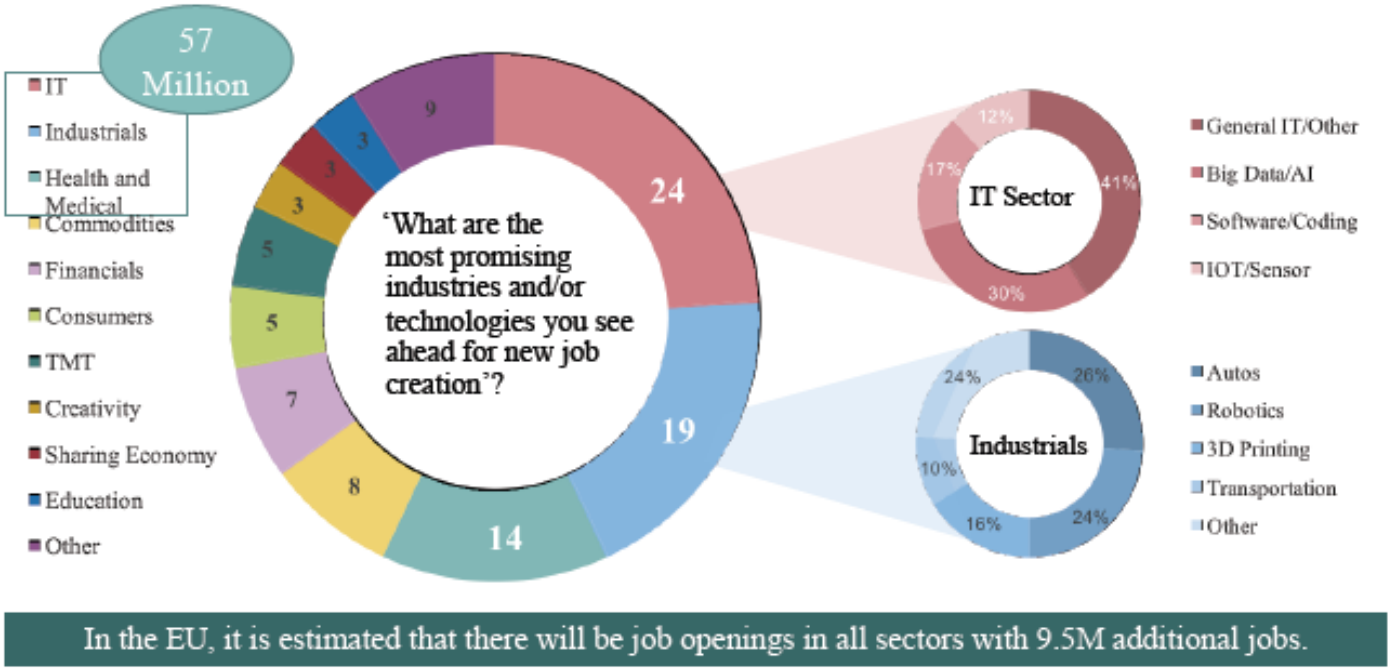
9% of jobs are at high risk of automation in G20 countries

However, many jobs are likely to experience significant change



Source: Arntz, Gregory and Zierahn, OECD - 2016.

What's new?



In the EU, it is estimated that there will be job openings in all sectors with 9.5M additional jobs.

(Sources: Technology At Work v2.0 - The Future Is Not What It Used To Be, CITI and Oxford Martin School, 2016)

Old jobs…

1. Retail Cashier

2. Telemarketer

3. Travel Agents

4. Dispatchers

5. Drivers

6. Farmers

7. Manufacturing Workers

8. Bank Tellers

9. Train Conductors

10. Translators

11. Librarians

12. Postal Service Workers

New jobs…

1. 3D Printing Engineers

2. Data Protection Managers

3. Augmented Reality Architects

4. Robot Polishers

5. Robot Technicians

6. Home Automation Contractor

7. Cyber Security Specialist

8. Personal Aide

9. Data Analyst

10. Software Developer

11. Market Research Analyst

12. Personal Branding Consultant

Hence…

Digitalization may offer the opportunity to:

- develop new commercial offers
- change the meaning of existing commercial offers
- change how firms organize business activities

amazon

Agenda

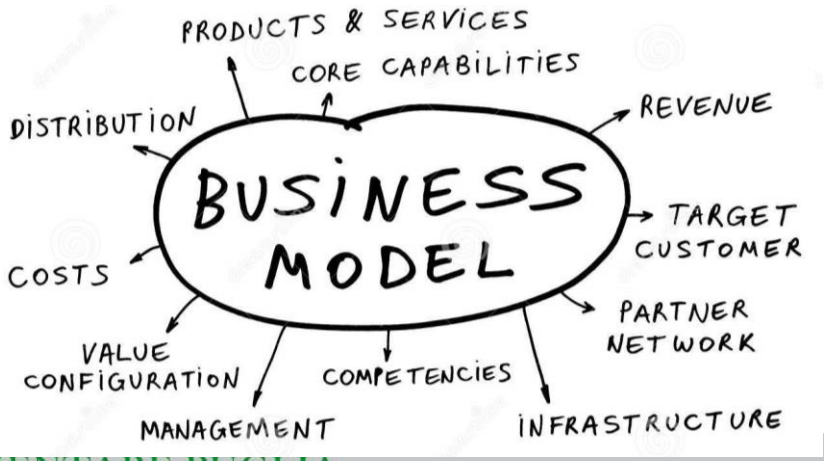
- Business Model: An Introduction
- Business Model: Main Elements

Business Model
An Introduction

What is a BM?

- A business model describe how a firm *generate*, *transfer* and *obtain* value.

- A business model can be described using some basic elements :
  - Customers
  - Product/service bundle
  - Infrastructure
  - Economic feasibility



Discovering Opportunities

History tells us that there are four common sources of **opportunities** – opportunities that are more than mere ideas – that any would-be entrepreneur can use

- Opportunities created by **macro trends** in society
- Opportunities found by living and experiencing the **customer problem**
- Opportunities created through **scientific research**
- Opportunities proven **elsewhere** that you can pursue here

Types of opportunities

Types of Opportunity:

Opportunity Pull:

the size of the opportunity attracts opportunity seekers to attempt to exploit it.

Example:

A drug to mitigate the effect of Alzheimer's disease.

Types of Opportunity:

Capability Push:

a new technology or capability causes a search for new applications.

Example:

Digital Television

Categories of opportunities

Nine Categories of Opportunity:

1. Increasing the value of a product or a service
2. New applications of existing means or technologies
3. Creating mass markets
4. Customization for individuals
5. Increasing reach
6. Managing the supply chain
7. Convergence of industries
8. Process innovation
9. Increasing the scale of the firm

When is writing a BM warrented?

Can you clearly evaluate:

- **Target segment(s)**
- **Market attractiveness**
- **Industry attractiveness**
- **Sustainable CA**
- **Team domain**

Target segment

Can you identify any customers?

- what customer pain will your business idea resolve
- evidence that your idea is superior (better, faster, cheaper) enough to get customers to change what they are doing now
- evidence that customers will buy
- list of initial customers

Defining a targeted market segment

- who, in terms of demographics or psycho-graphics
- where, in terms of geography
- benefit expected

Will this segment lead to others?

Market attractiveness

What sort of business do you want?

- niche or promising

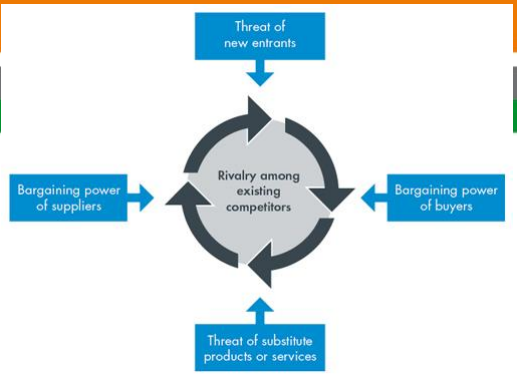
How large is the market?

- number of customers
- how much do they spend
- how fast has the market grown, and will it continue to grow
- large markets offer the chance for multiple players and for segmentation

What **economic, demographic, socio-cultural, technological, regulatory, or fashion trends** will affect your market positively or negatively?

In short, the key variables are **market size and market growth**

Industry attractiveness



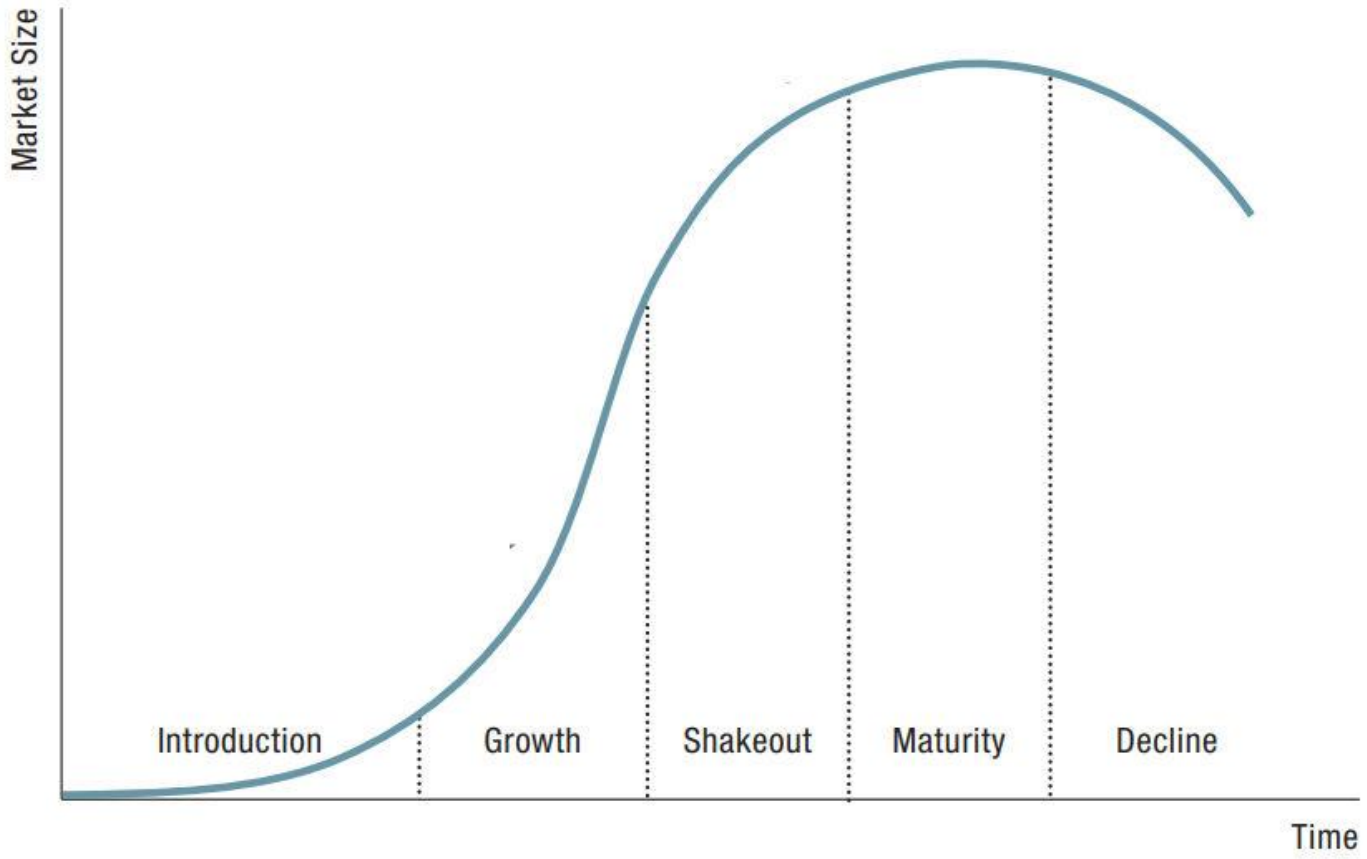
What industry are you competing in?

- How attractive is this industry?
- Can you do a SWOT analysis?

These **five competitive forces** determine **industry attractiveness** (i.e. margins):

1. Threat of new entrants: How difficult is it for others to enter this industry?
2. Threat of substitute products or services: What are the substitute products and services to yours? How difficult is it for them to steal your customers?
3. Bargaining power of suppliers: Do suppliers have the power to set terms and conditions?
4. Bargaining power of buyers: Do customers have the power to set terms and conditions?
5. Rivalry among competitors: How intense is the competitive rivalry in the industry?

Industry life-cycle



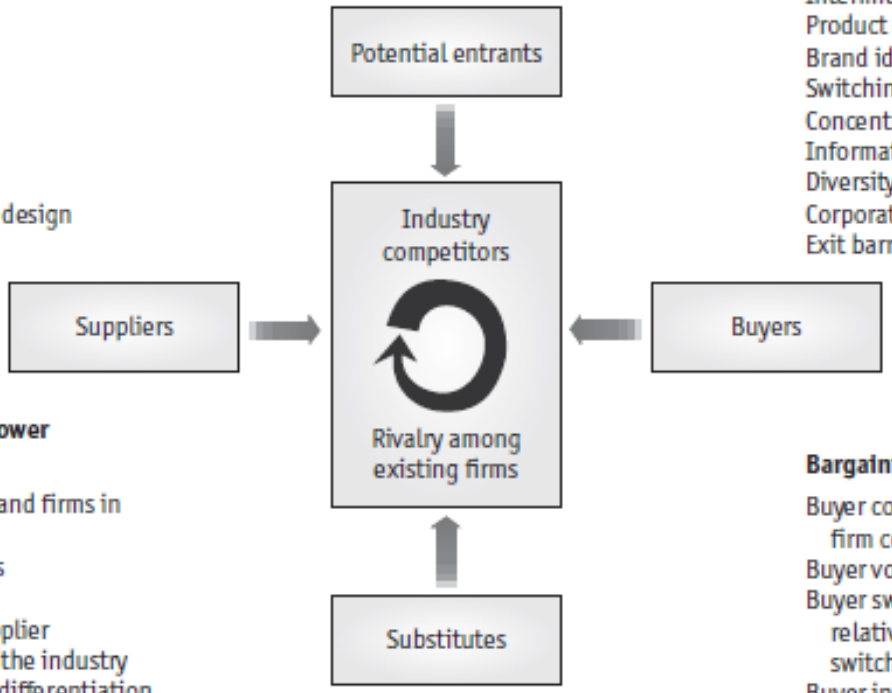
Industry competition

Entry barriers

Economies of scale
Proprietary product differences
Brand identity
Switching costs
Capital requirements
Access to distribution
Absolute cost advantage
Proprietary learning curve
Access to necessary inputs
Proprietary low cost product design
Government policy
Expected retaliation

Rivalry determinants

Industry growth
Fixed (or storage) costs/value added
Intermittent overcapacity
Product differences
Brand identity
Switching costs
Concentration and balance
Informational complexity
Diversity of competitors
Corporate stakes
Exit barriers



Determinants of supplier power

Differentiation of inputs
Switching costs of suppliers and firms in industry
Presence of substitute inputs
Supplier concentration
Importance of volume to supplier
Cost relative to purchases in the industry
Impact of inputs on costs or differentiation
Threat of forward integration relative to threat of backward integration by firms in the industry

Determinants of substitution threat

Relative price performance of substitutes
Switching costs
Buyer propensity to substitute

DETERMINANTS OF BUYER POWER

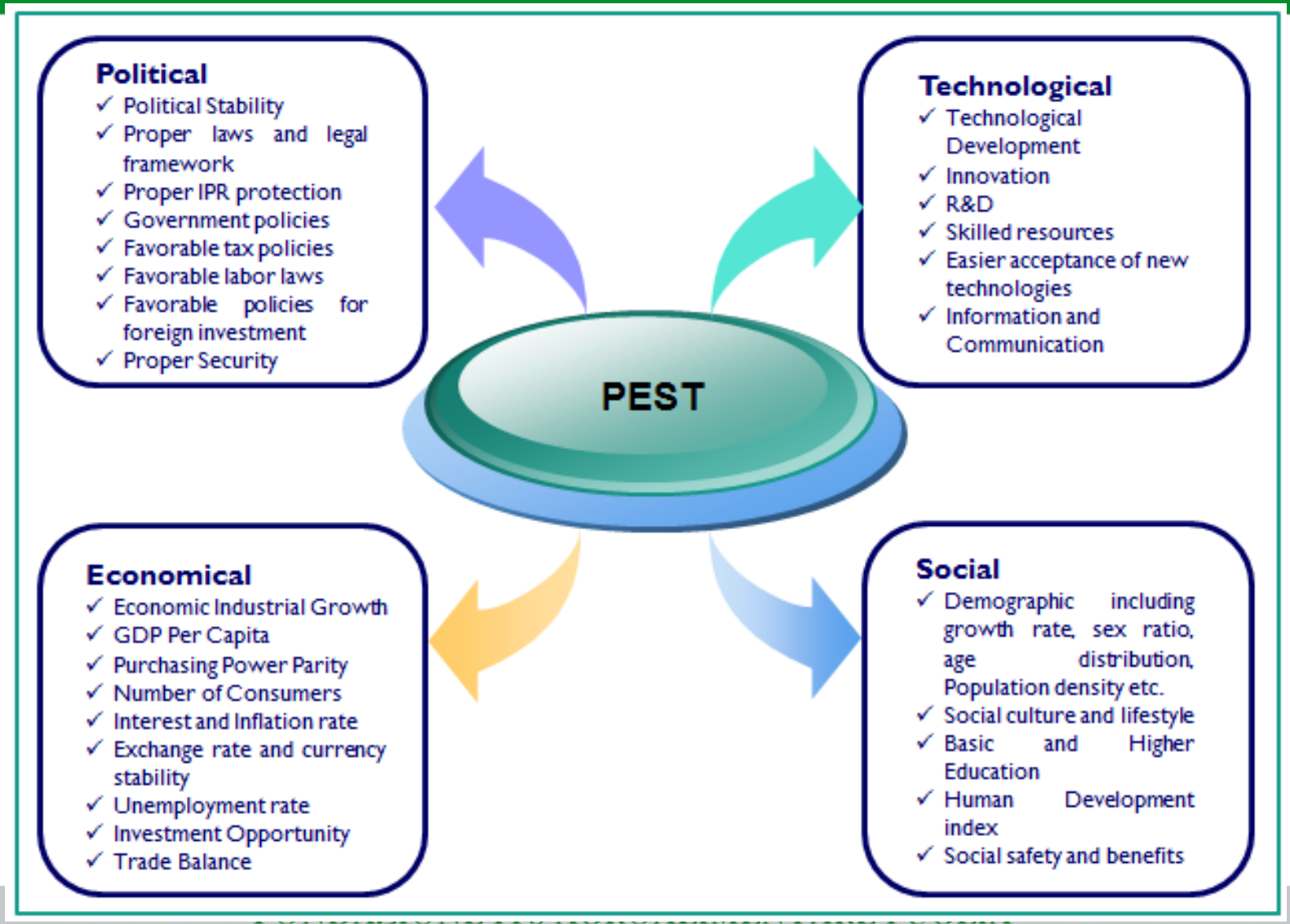
Bargaining leverage

Buyer concentration vs. firm concentration
Buyer volume
Buyer switching costs relative to firm switching costs
Buyer information
Ability to backward integrate
Substitute products
Pull-through

Price sensitivity

Price/total purchases
Product differences
Brand identity
Impact on quality/ performance
Buyer profits
Decision-makers' incentives

PEST analysis



Competitors

Rank a business against its competitors based on key success factors (KSF)

		— Own business —		— Competitor A —		— Competitor B —		— Competitor C —	
KSF	*Importance weight*	*Strength rating*	*Firm strength*	*Strength rating*	*Firm strength*	*Strength rating*	*Firm strength*	*Strength rating*	*Firm strength*
Market share	0.25	4.0	1.0	3.0	0.8	1.5	0.4	1.2	0.3
Distribution	0.20	3.0	0.6	4.0	0.8	2.5	0.5	2.3	0.5
Brand image	0.16	4.0	0.6	3.9	0.6	2.0	0.3	5.0	0.8
Product quality	0.13	3.0	0.4	2.8	0.4	1.6	0.2	5.0	0.7
Product variety	0.11	5.0	0.6	3.9	0.4	3.0	0.3	1.0	0.1
Patents	0.08	4.0	0.3	4.0	0.3	2.0	0.2	4.0	0.3
R&D	0.04	4.0	0.2	4.0	0.2	2.0	0.1	4.0	0.2
Financial resources	0.03	5.0	0.2	4.0	0.1	3.0	0.1	2.0	0.1
Overall	1.00		3.8		3.6		2.1		2.9

Sustainable CA

A **sustainable competitive advantage** is a difference that can be preserved - a proprietary asset, a core competence, which

- delivers greater value to customers
- and/or comparable value at lower cost
- or enters a niche market where there is no competition

Do you possess proprietary advantages that other firms cannot duplicate?

Can your business **develop and deplo**y superior organizational resources, assets, processes, or **values** that other companies will have difficulty in matching?

- What is the evidence?

Is your business model viable?

- Can it be expanded to new markets? Is it scalable?
- How much time do you have till you run out of cash?

SWOT analysis

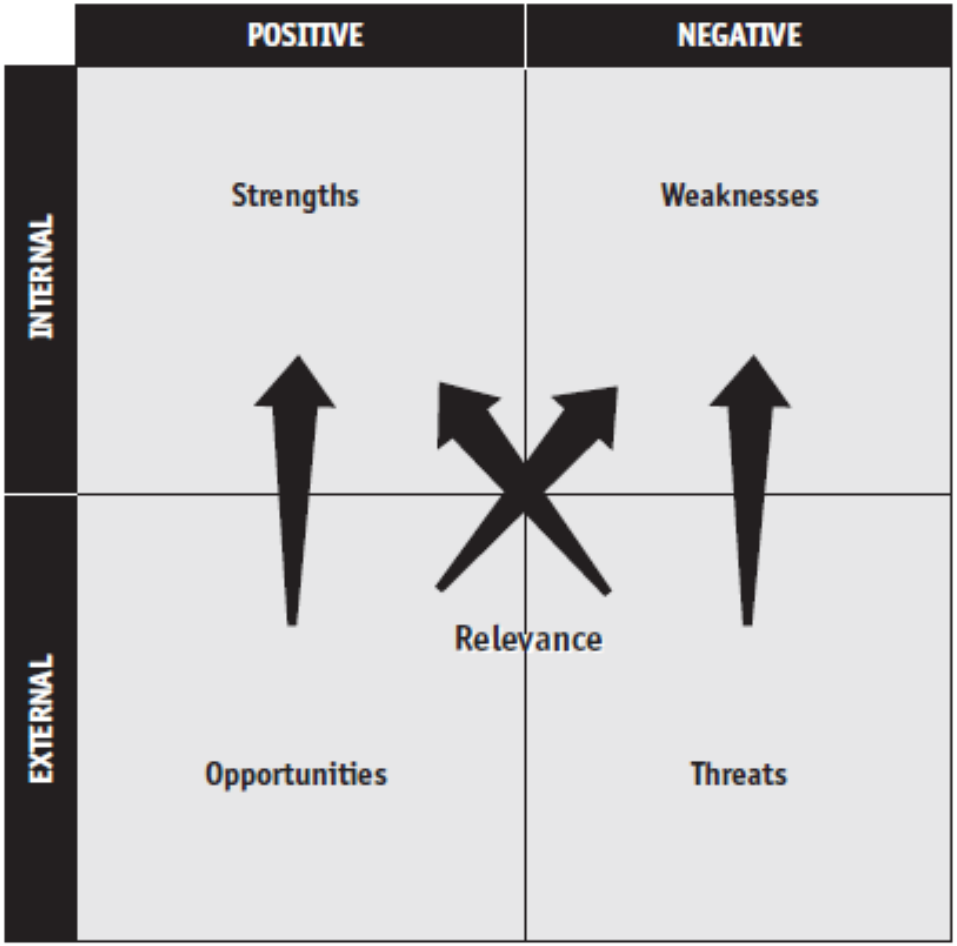
Analysis of the firm
- VRIO analysis
- Key differentiators and USPs
- Value add analysis
- Value chain
- Value system
- Resource audit
  - Operations
  - Human
  - Organisational
  - Financial

Market analysis

Product, portfolio and matrix analysis

Environmental analysis
- PEST

Industry and competitor analysis
- 5 forces
- Competitor analysis
- KSF analysis
- Industry life cycle



Team domain

Are you clear about your mission, aspirations, and risk propensity?

- How much do you care about this business?
- How focused are you?

Can you identify the few critical success factors, the ones that really make a difference?

- Can you and your team really do this?
- Where is the evidence?
- Do you have the experience and drive?
- Can you sell this product/service?

Who do you know up, down and across the value chain?

- How well do you know this business, the customers, the key suppliers, other key players from whom you will need support?

Business Model Elements

Building Blocks

- Customer segments
- Value Proposition
- Channels
- Customer relationship
- Revenue streams
- Key resources
- Key activities
- Key partnership
- Cost structure

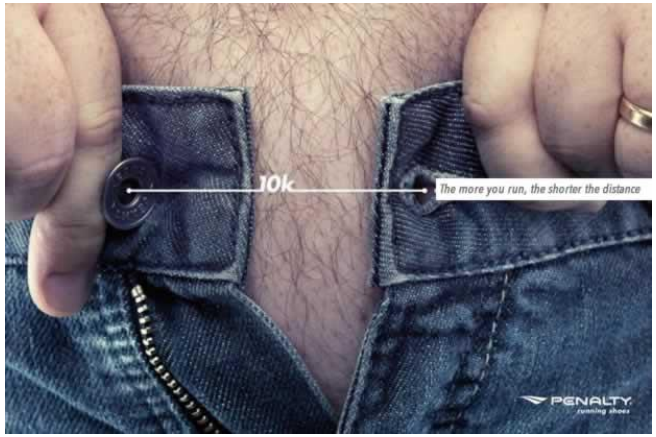
Value Proposition

- It is the bundle of product and services which generate value for a specific customer segment(s).

- It is the reason why customers move from one firm to another.

Value Proposition

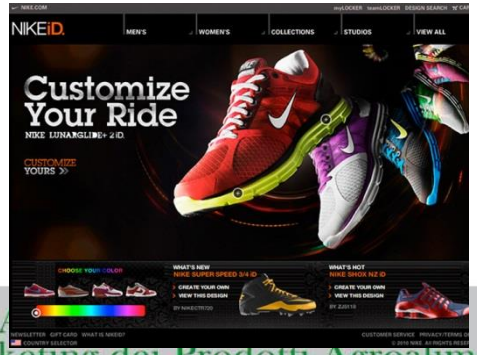
- It solves a problem or satisfies a request.



- Innovative (new, disruptive) vs. existing (with new features)

Value Proposition

- It can be quantitative (price, time) or qualitative (design, customer experience), for example:
  - Novelty – create new needs
  - Performance – improving some performance
  - Customization – customer co-creation (NikeID)



Value Proposition

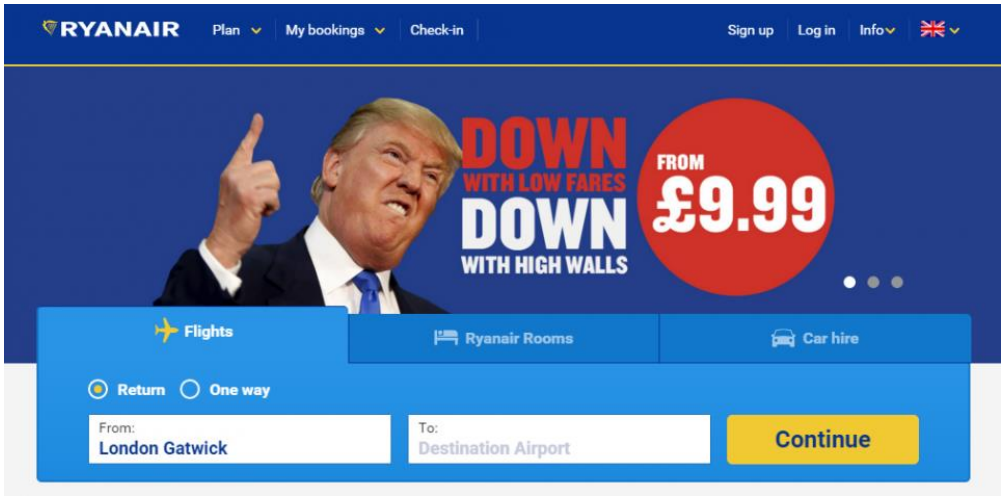
- «getting the job done»

- Design

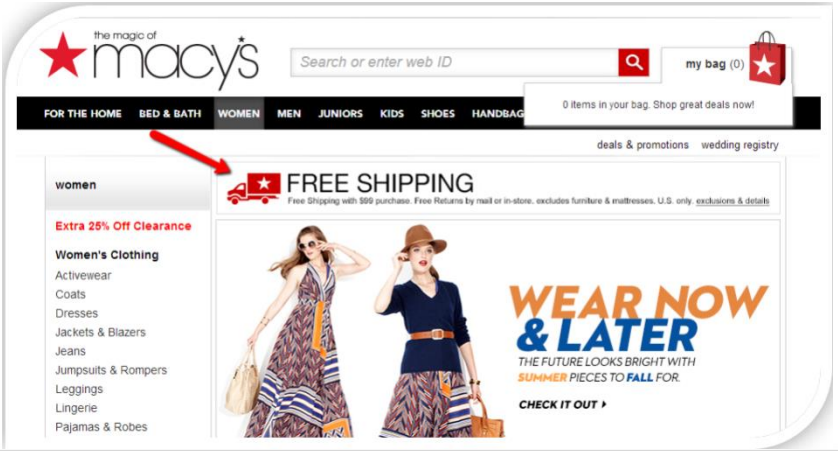
- Brand/status

Value Proposition

- Price → quality/price perception



- Costs reduction



Value Proposition

- Risk reduction (giving some warranty)

- Convenience/usability – making it convenient or easy to use

Value proposition

1. What is the important customer and market need?
2. What is the unique approach for addressing this need?
3. What are the specific benefits per costs that result from this approach?
4. How are these benefits per costs superior to the competition's and the alternatives?

A value proposition in business and marketing is a statement summarizing

- the customer segment, competitor targets, and the core competencies
- differentiation of one's product from the offerings of competitors

Value proposition should answer the questions: "Why should I buy this product or service?" as well as "Why should I do anything at all?" It is a clear and specific statement about the tangible benefits of an offering

Value proposition

The **Value Proposition** defines the company to the customer.

Five values offered to a customer

1. **Product:** Performance, quality, features, brand, selection, search, easy to use, safe
2. **Price:** Fair, visible, consistent, and reasonable
3. **Access:** Convenient, location, nearby, at-hand, easy to find, in a reasonable time
4. **Service:** Ordering, delivery, return, check-out
5. **Experience:** Emotional, respect, ambiance, fun, intimacy, relationships, community

Customer segments

- It defines the groups of customers or firms that it is decided to reach and serve.
- It is better to gather customers: segments.
- It is important to target the segments.
- The business model is designed around these segments (knowing their needs, etc.).

Customer segments

- Mass market
  - No differences across segments (value proposition, distribution channels, customer relationship)
  - All customers with same needs and issues
- Niche market
  - Focused on a niche
  - Based on supplier/customer relationship

Customer segments

- Segmented market
  - Segments with specific characteristics

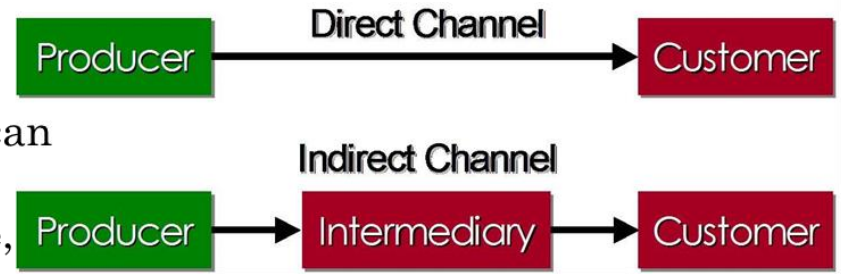
- Diversified
  - Segments very different across them

- Multi-sided platforms (or markets)
  - Interdependent segments

Channels

- It defines how the firm reaches its customer segments and gives them the value proposition
- Communication, distribution and sell channels are the interfaces with customers.
- Goals:
  - Introducing products and services to the customers
  - Helping customers to evaluate the value proposition
  - Making it possible to purchase the product or service
  - Delivering the value proposition to customers
  - Giving after sales assistance

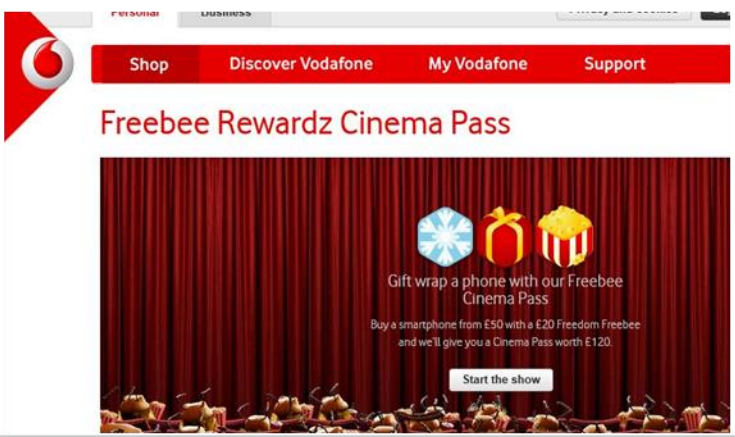
Channels



- Any channel has five phases (it can cover any or some of them): awareness, evaluation, purchase, delivery and after sales
- Direct vs. indirect channel
- Property vs. partner channel
- Understanding what channels customers like more
- Mixing different types of channels

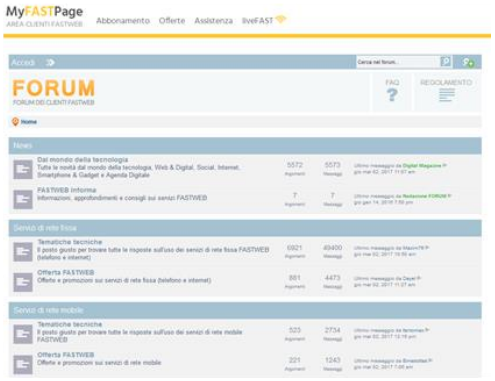
Customer relationships

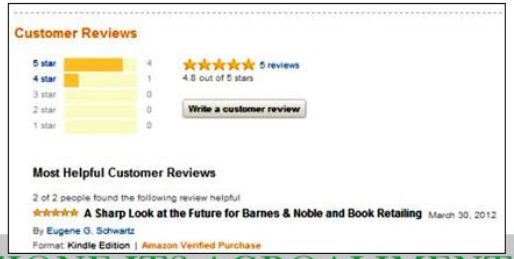
- It is the type of relationship established with each segment of customers.
- Personal vs. automatic
- Relationships can aim at different goals:
  - Acquiring new customers
  - Retaining customers
  - Upselling



Customer relationships

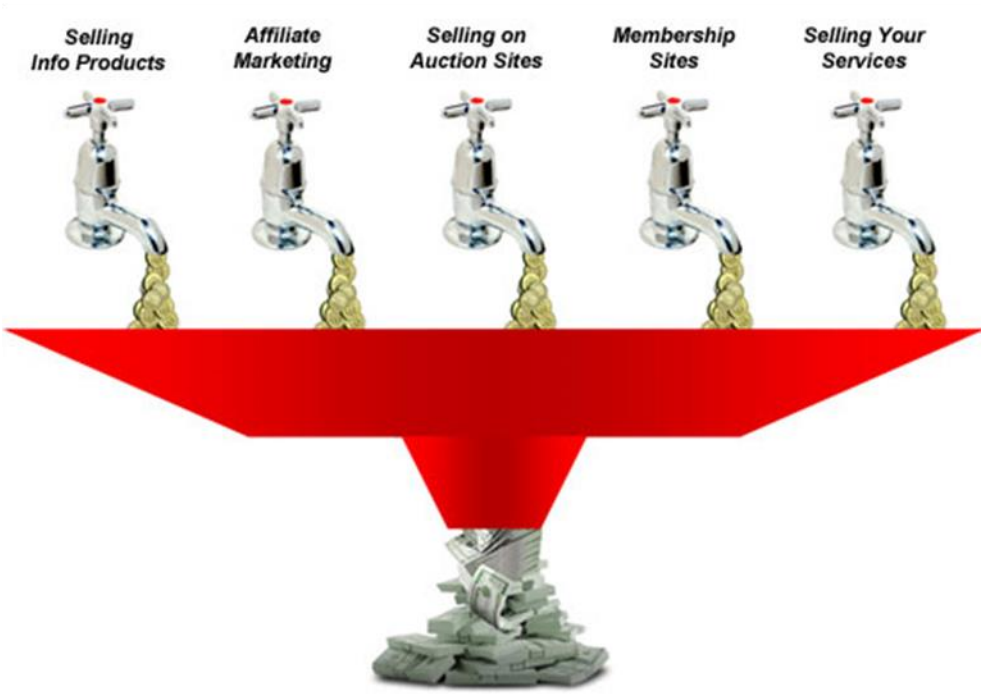
- Different types of customer relationships:
  - Personal assistance
  - Dedicated personal
  - Self-service
  - Automatic services
  - Communities
  - Co-creation





Revenue streams

- These are the money coming from each customer segment (removing the costs →profit)
- Each stream may have different pricing.
- It can be :
  - One-time payment
  - Recurring payment (recurring product/service furniture or after sale support)



Revenue streams

- It can be generated in different ways:
  - Asset sale
  - Usage fee
  - Subscription fees
  - Lending/renting/leasing

Revenue streams

- It can be generated in different ways:
  - Licensing
  - Brokerage fees
  - Advertising

Revenue streams

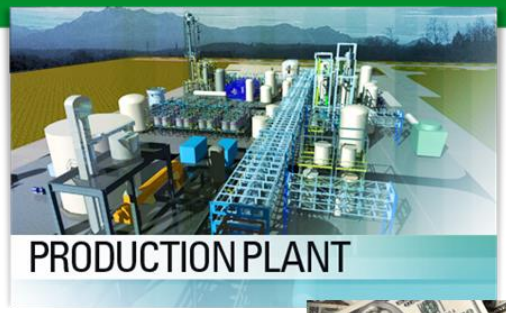
- Each stream has a different pricing mechanism (fixed vs. dynamic)

Pricing Mechanisms

Fixed Menu Pricing Predefined prices are based on static variables		**Dynamic Pricing** Prices change based on market conditions	
List price	Fixed prices for individual products, services, or other Value Propositions	*Negotiation (bargaining)*	Price negotiated between two or more partners depending on negotiation power and/or negotiation skills
Product feature dependent	Price depends on the number or quality of Value Proposition features	*Yield management*	Price depends on inventory and time of purchase (normally used for perishable resources such as hotel rooms or airline seats)
Customer segment dependent	Price depends on the type and characteristic of a Customer Segment	*Real-time-market*	Price is established dynamically based on supply and demand
Volume dependent	Price as a function of the quantity purchased	*Auctions*	Price determined by outcome of competitive bidding

Key resources

- These assets (resources) are necessary to make the business model working.
- These can be property of the firm, purchased or rented from key partners.
- Key resources can be:
  - material
  - financial
  - intellectual
  - human



UNITED STATES PATENT OFFICE.

ALEXANDER SAMUELSON, OF TERRE HAUTE, INDIANA, ASSIGNOR TO ROOT GLASS COMPANY, OF TERRE HAUTE, INDIANA.

DESIGN FOR A BOTTLE OR SIMILAR ARTICLE.

48,160. Specification for Design. Patented Nov. 16, 1915.

Application filed August 18, 1915. Serial No. 46,196. Term of patent 14 years.

To all whom it may concern:

Be it known that I, ALEXANDER SAMUELSON, a citizen of the United States, residing at Terre Haute, in the county of Vigo and State of Indiana, have invented a new, original, and ornamental Design for Bottles or Similar Articles, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

Figure 1 is a perspective view of a bottle showing my design. Fig. 2 is a bottom plan view of the same.

I claim:

The ornamental design for a bottle or similar article, as shown.

ALEXANDER SAMUELSON.

DESIGN.

A. SAMUELSON.

BOTTLE OR SIMILAR ARTICLE.

APPLICATION FILED AUG. 18, 1915.

48,160. Patented Nov. 16, 1915.

FIG. 1.

FIG. 2.

Witness:

Inventor

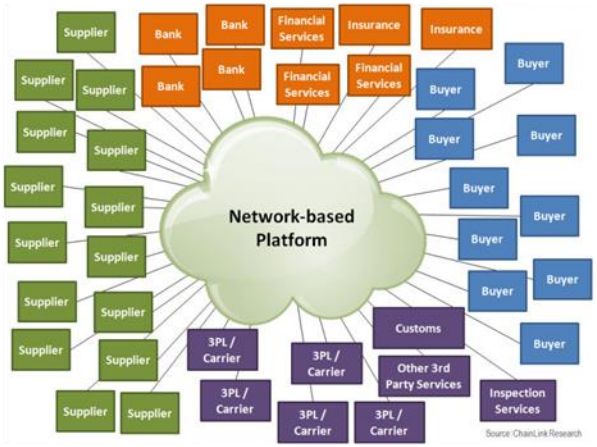
A. Samuelson

Attorney

Key activities

- These activities are necessary to make the business model working.

- Key activities can be:
  - production
  - problem solving
  - Platform/network



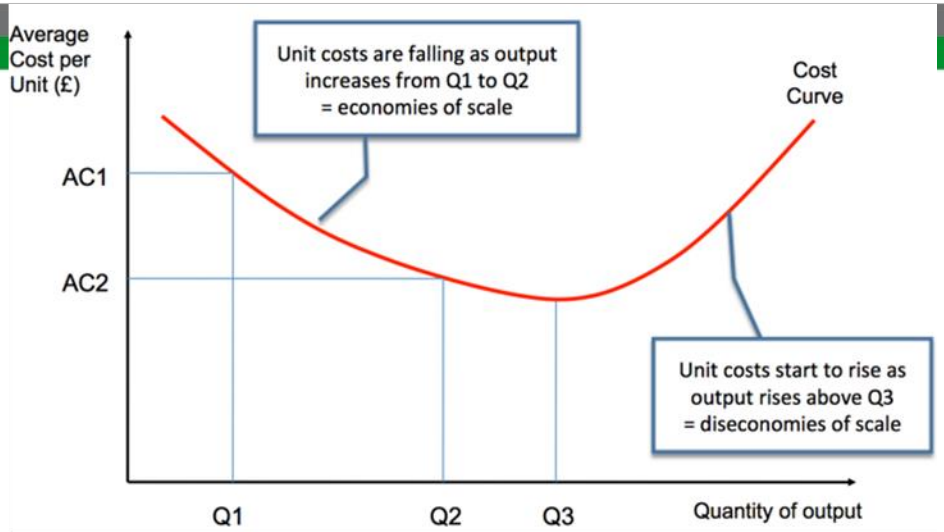
Key partnerships

- The network of suppliers and partners is necessary to make the business model working.

- Key partnerships can be :
  - not competitor alliances
  - Competitor alliances
  - Joint venture for new business development

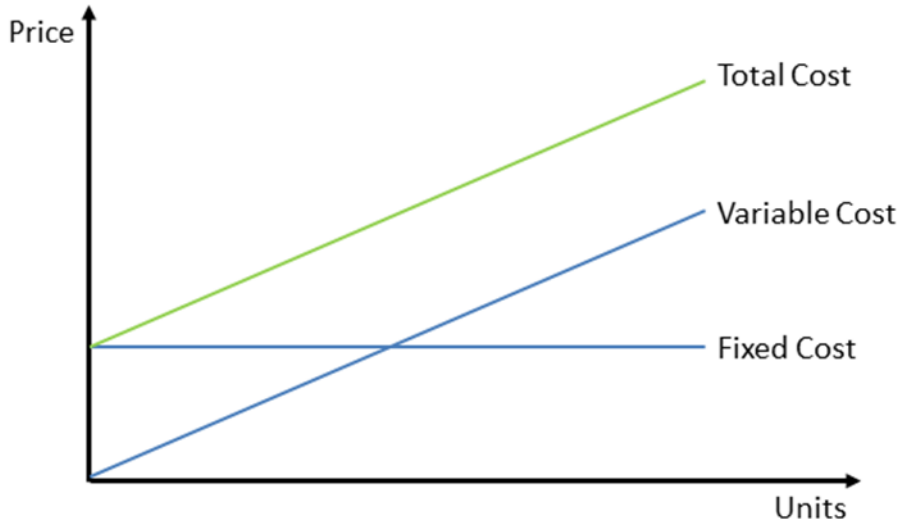
Key partnerships

- Key partnerships rise for:
  - Optimizing the business (economies of scale)
  - Reducing risk and uncertainty
  - Acquiring resources or activities



Cost structure

- These are the most relevant costs of the business model.
- These are very important for some business models (no frills airlines).
- Two cost structures do exist:
  - Cost-driven
  - Value-driven
- Cost structure may have these characteristics:
  - Fixed costs
  - Variable costs
  - Economies of scale
  - Economies of scope



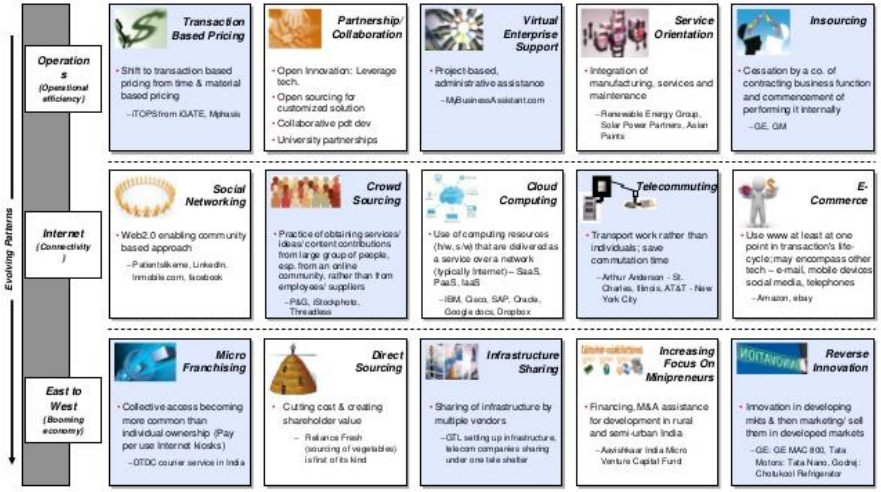
Business model – Canvas

The Business Model Canvas

Key Partners 	***Key Activities*** 	***Value Proposition*** 	***Customer Relationships*** 	***Customer Segments*** 
	Key Resources 		***Channels*** 	
Cost Structure 		***Revenue Streams*** 		

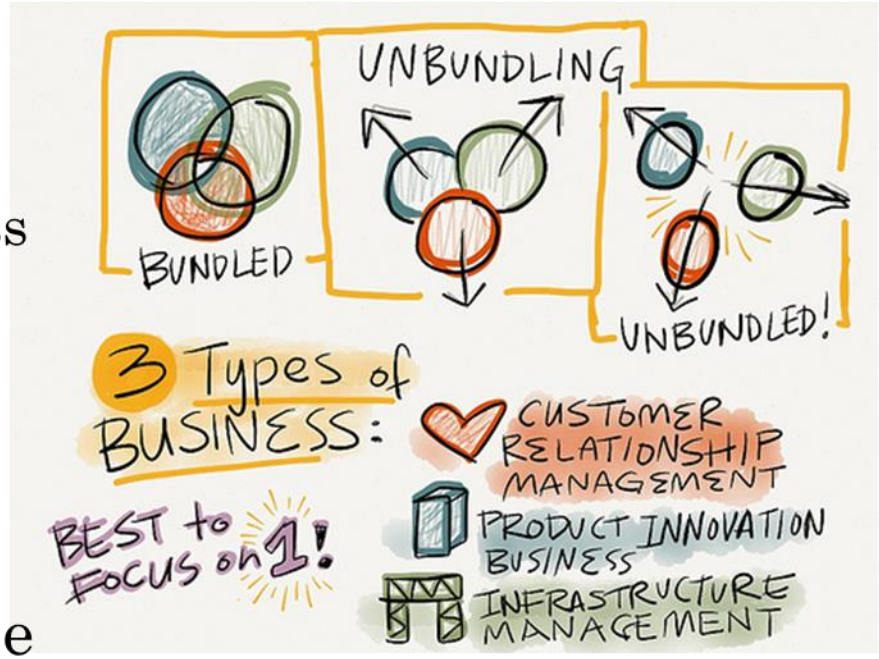
Business models - patterns

- Unbundling Business Models
- The Long Tail
- Multi-Sided Platforms
- Free as a Business Model
- Open Business Models



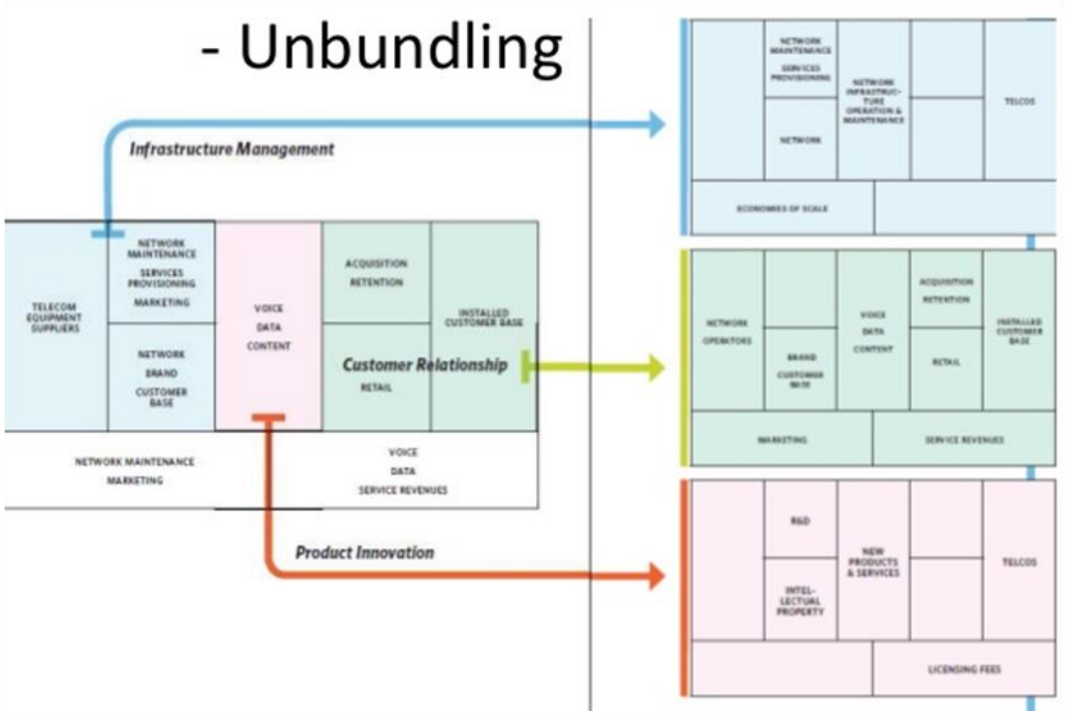
Unbundling

- Each firm has three different economic, competitive and cultural goals:
  - Customer relationship business
  - Product innovation business
  - Infrastructures business
- These three goals have different roots and they can be in conflict among themselves
  - Solution: just take one (or two) of them



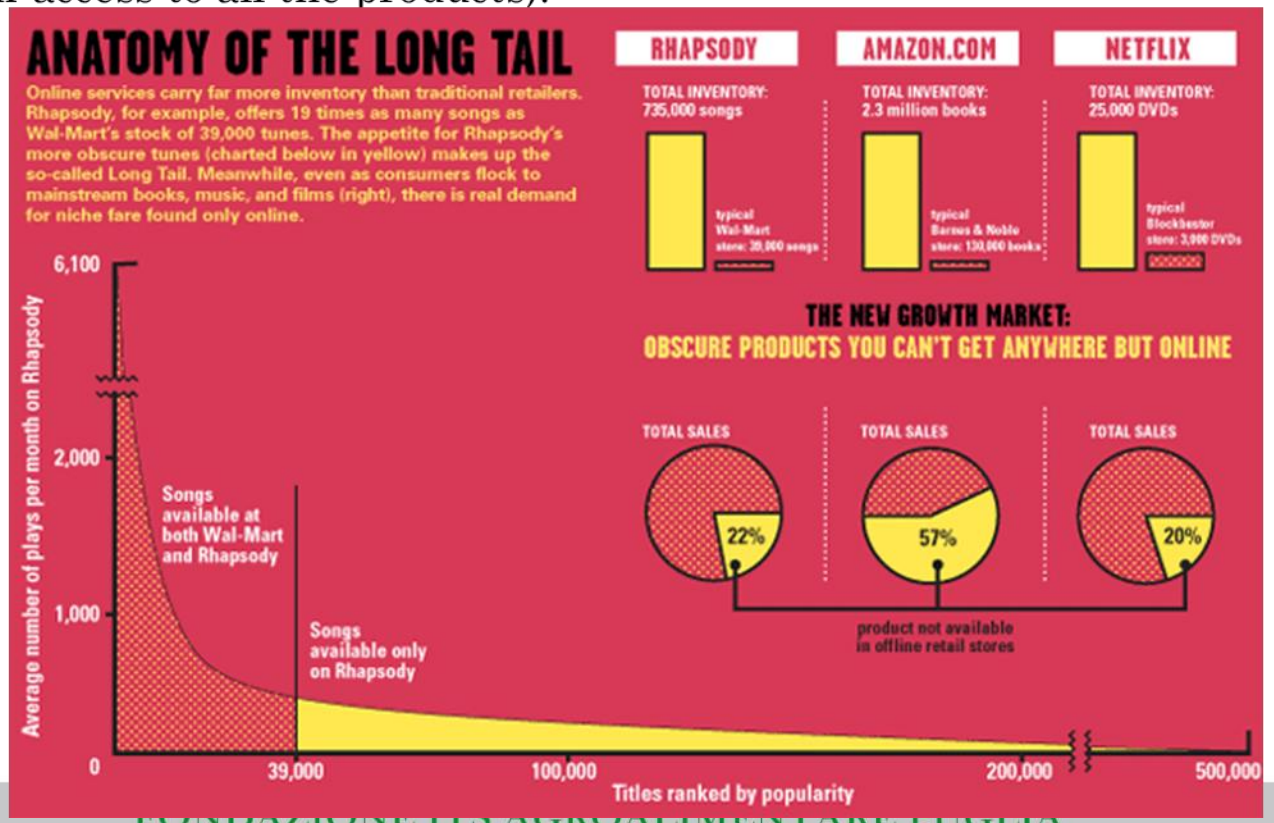
Example

- Business case: phone company (Vodafone)
  - Customer relationship business (it becomes the key asset)
  - Product innovation business (outsourcing with small companies → these companies are more focused on innovation)
  - Infrastructures business (Telecom infrastructures)



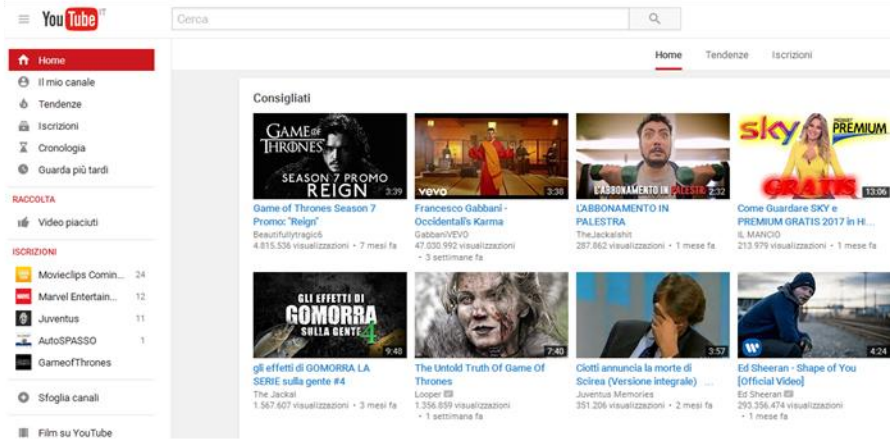
Long tail

- It is based on selling many niche products.
- Total selling of niche products can be more profitable than total selling of bestseller products.
- This business model needs low inventory costs and a solid platform (for having easy and quick access to all the products).



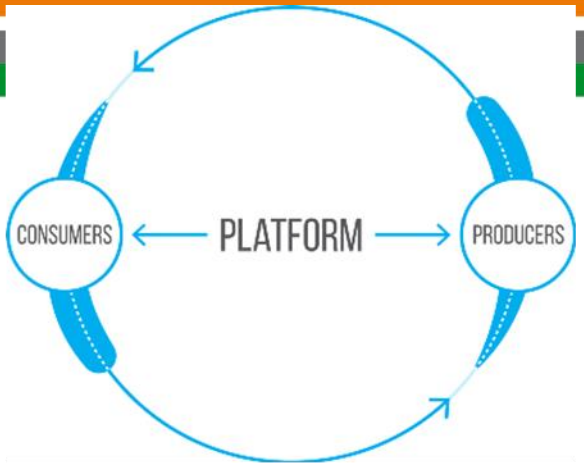
Example

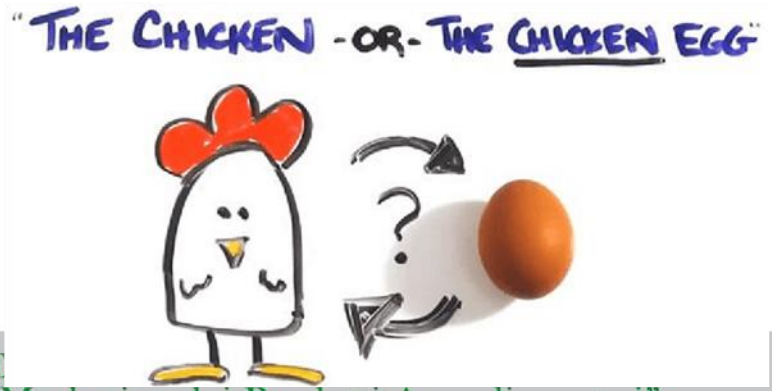
- Successful business cases:
  - Amazon
  - Netflix
  - eBay
- It has been possible since:
  - Democratization of production tools
  - Democratization of distribution
  - Reduction of the costs for connecting demands and offers
  - From editors to Lulu.com
  - From Lego to Lego Factory



Multi-sided

- It connects different customers segments which are interdependent among themselves.
- This model generates value for a customer segment only if there are also the other segments.
- It generates value by simplifying the interactions between segments.
- The value of this model increases if the number of users increases (network effect).
- How to attract distinct segments? Attracting one (with discount) to attract the other(s).
  - Which segment attracting at first?
  - At what price?





Example

UBER

Connecting drivers and passengers

amazon

Connecting buyers and sellers

airbnb

Connecting homestays and tourists

Google play

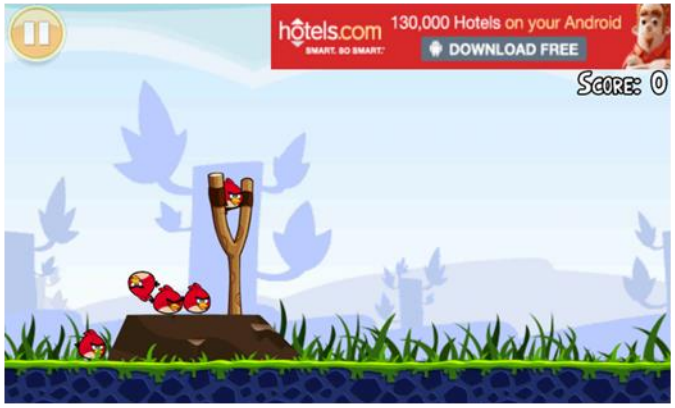
Connecting app developers and mobile users

Free

- At least one segment has to enjoy a continuous free service
- Different customer segments make possible to offer a free product/service ("free" customers are financed by customers in other segments).
- How is it possible:
  - advertising
  - Freemium model (basic or premium subscription)
  - Bait & hook (free at the beginning and payment later)

Example

- Advertising-based:
  - One segment enjoys a free product/service
  - One segment pays for advertising
  - Angry Birds Android (vs. iOS)
  - Metro journal



- Many users do not always mean high revenue from advertising:
  - Facebook

Open

- It is based on collaboration.
- I can be «outside in» or «inside out»
- The basic idea is that it is possible to gain more money by sharing knowledge than by appropriating knowledge.

Example

- Case studies:
  - Procter & Gamble (connect and develop → outside in)
  - GlaxoSmithKline (patent pool → inside out)
  - InnoCentive (kind of multi-side)

Hence…

Write a BM for:

- the development of an App for creating **sports match** (soccer, basketball, volleyball, etc.)
- the development of an App for managing **wedding**

Contatti

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