

2022/23 Semester 1

IS3103 Information Systems Leadership and Communication

Lecture 5

Leading Digital Transformation and Innovation

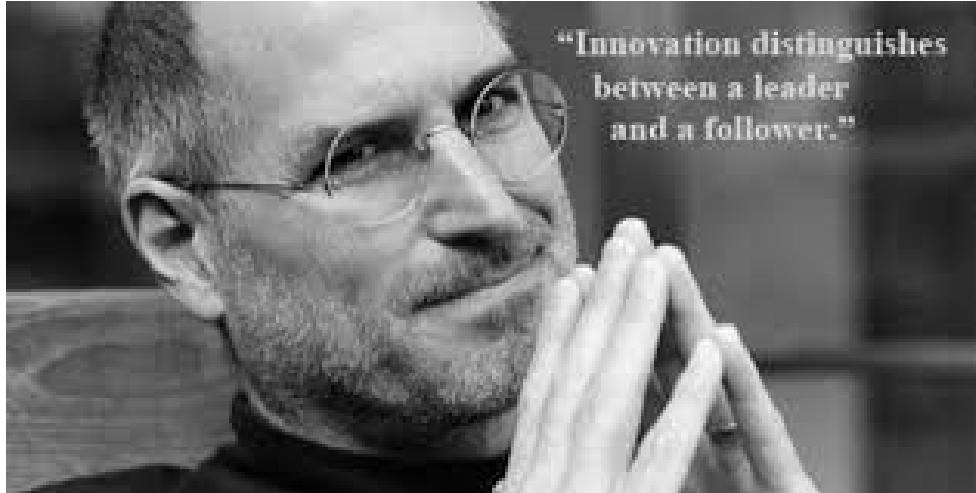
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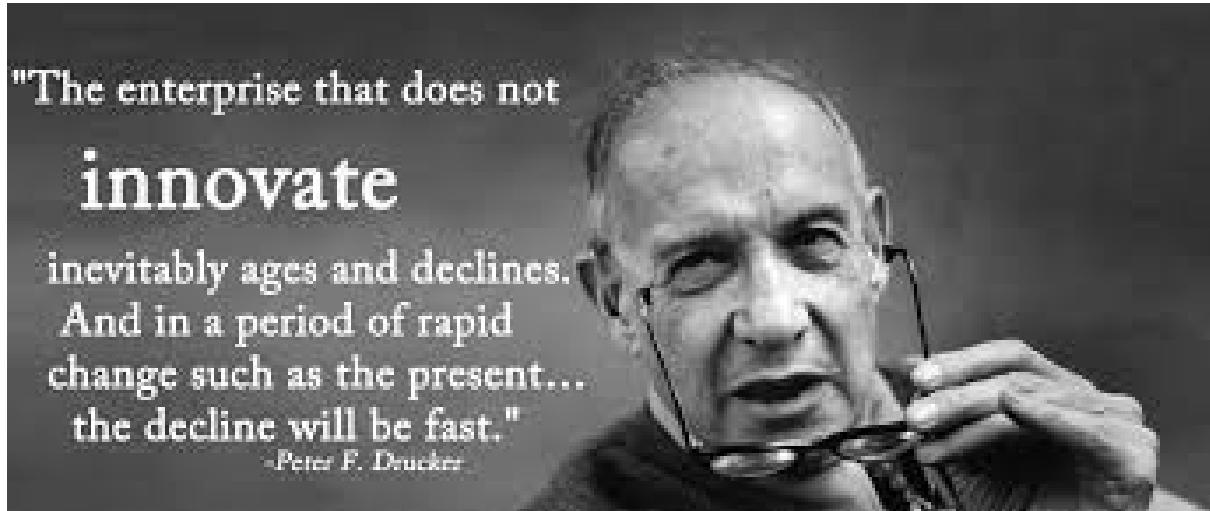
Why Innovate?



Innovation is the ability to see change as an opportunity - not a threat

— Steve Jobs —

"The enterprise that does not
innovate
inevitably ages and declines.
And in a period of rapid
change such as the present...
the decline will be fast."
—Peter F. Drucker



Creativity vs Innovation



- ▶ Creativity
 - ▶ capability or act of conceiving something original or unusual
 - ▶ abstract
 - ▶ Innovation
 - ▶ implementation or creation of something new that has ***realized value*** to others
 - ▶ measurable
- Innovation = Creativity x Execution**
- ▶ Invention

creation of something that has never been made before and is recognized as the product of some unique insight (usually resulting in patents)



-
- ▶ “All innovation begins with creative ideas... [Creativity] is necessary, but not a sufficient condition for [Innovation].” So Creativity is a crucial element required for innovation. But by itself, it almost never leads to the implementation of an innovation, at least not in an organizational setting. ”

Teresa Amabile et al. (1996)

- ▶ **So as a leader, which do you focus on, creativity or innovation?**



How to Innovate?

- ▶ To compete, companies must continually pursue many types of innovation

	Incremental innovations small improvements in existing products and operations	Architectural innovations technological or process advances to fundamentally change a component or element of the business	Discontinuous innovations radical advances that may profoundly alter the basis for competition in an industry
New customers			
Existing customers			

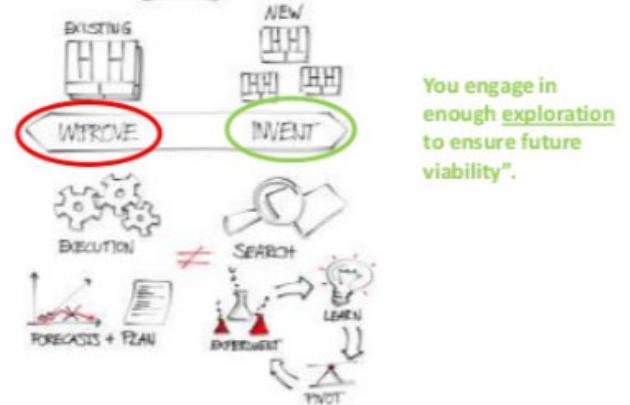


Ambidextrous Organization

(Harvard Business Review, O'Reilly & Tushman 2004)

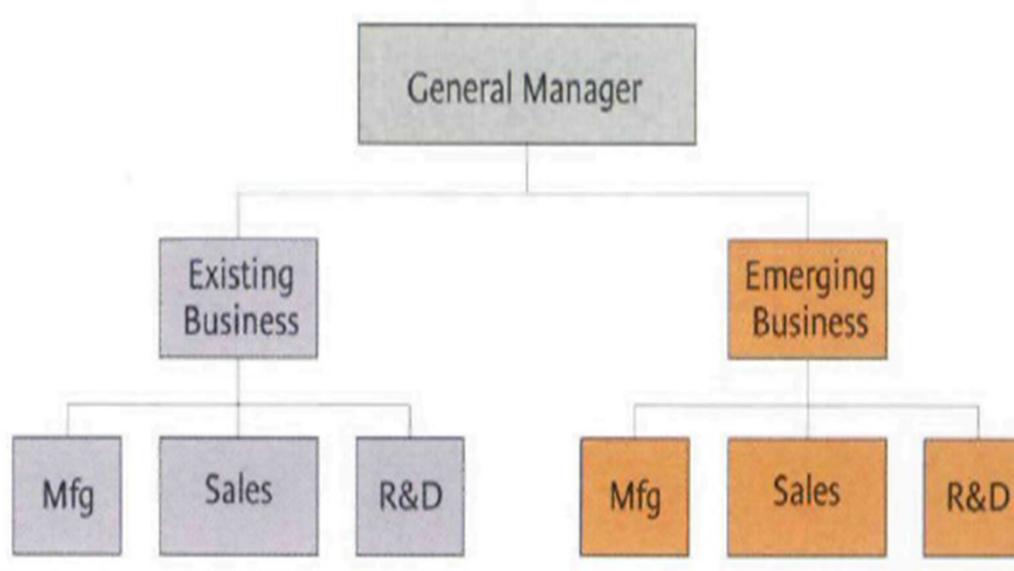
- ▶ Some companies quite successful at both *exploiting* the present and *exploring* the future. Why?
 - ▶ They separate their new, exploratory units from their traditional units
 - ▶ Allowing for different processes, structures and cultures
 - ▶ Maintain tight links across units at the senior executive level
 - ▶ Manage organizational separation through a tightly integrated senior team
- ▶ **These companies are called “ambidextrous organizations”**

You engage in enough exploitation to ensure current viability.



Ambidextrous Organizations

- Establish project teams are structurally independent units
- Each having its own processes, structures, and cultures
- But are integrated into existing management hierarchy



Scope of the Ambidextrous Organization

- ▶ Exploiting the present and exploring the future

Alignment of :	Exploitative Business	Exploratory Business
Strategic Intent	Cost, profit	Innovation, growth
Critical tasks	Operations, efficiency	Adaptability, new products, breakthrough innovation
Competencies	Operational	Entrepreneurial
Structure	Formal, mechanistic	Adaptive, loose
Controls, rewards	Margins, productivity	Milestones, growth
Culture	Efficiency, low risk, quality, customers	Risk taking, speed, flexibility, experimentation
Leadership role	Authoritative, top down	Visionary, involved



Digital transformation (DT)

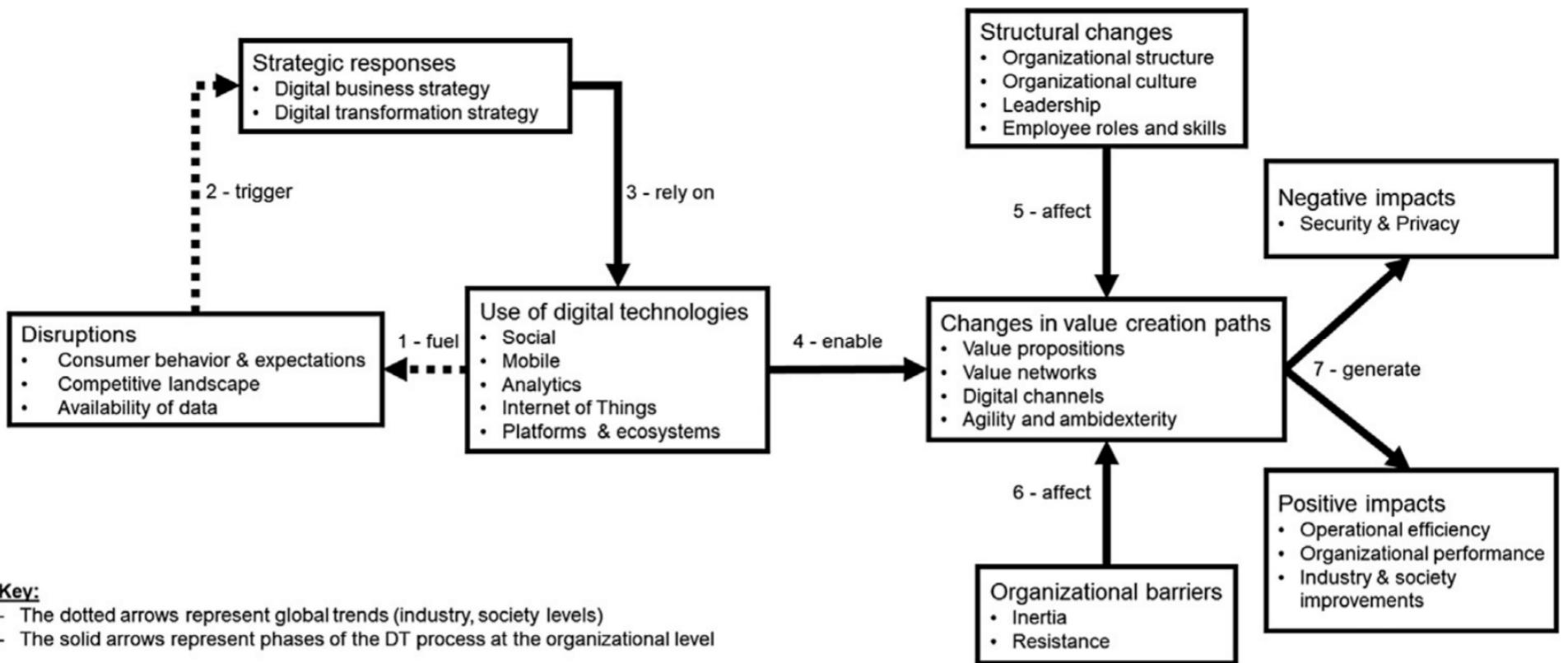
- ▶ Digital transformation is complex and challenging for senior executives
 - ▶ **Digital transformation:** companies use new digital technologies (such as social media, mobile access, analytics or embedded devices) to enable major business improvements (like enhancing customer experience, streamlining operations or creating new business models)
 - ▶ “a process that aims to improve an entity by triggering significant changes to its properties through combinations of information, computing, communication, and connectivity technologies”
-



Nature of digital technologies

- SMACIT technologies
 - **social, mobile, analytics, cloud and the internet of things**
- platforms are also an important category
- blockchain is also an emerging technology
- Combinations of technologies are particularly relevant in the context of DT
 - For e.g., the ability to implement algorithmic decision-making may be contingent upon a firm's ability to perform analytics on big data collected through individuals' use of social media on their mobile phones

Building Blocks of the DT Process



Note: The arrows do not represent a statistical relationship or a causality found in variance models.

Understanding the Economic Value of Digitization (i.e., DT)

What is digitization?

It is the use of information technology to improve any aspect of business—processes, products, services, assets, information or interactions—thereby increasing value to customers

Digitization increases a firm's *technological affordances*, which thereby increase user or organizational ability or efficiency, which leads to greater value (through higher revenue and/or lower costs)

Technological affordances	Organizational ability or efficiency	through higher revenue and/or lower costs
Digitization <i>enables</i> sensing, storing, processing, tracing or combining data	in a way that improves the efficiency of processes or enhances the services	offered to customers, resulting in greater value

Understanding the Economic Value of Digitization

To better assess the basic thesis that **digitization leads to economic value**, it is useful to understand the components of economic value (EV):

Assume that a firm sells products and services to a consumer:

- The consumer values the products and services at his/her Reservation Price (R)
- The firm has a Marginal Cost (MC) for each unit of product or service sold
- The Market Price (MP) at which the firm can sell products and services depends on the competitive and economic environment

Economic Value (EV) created by a firm = Reservation Price (R) – Marginal Cost (MC)

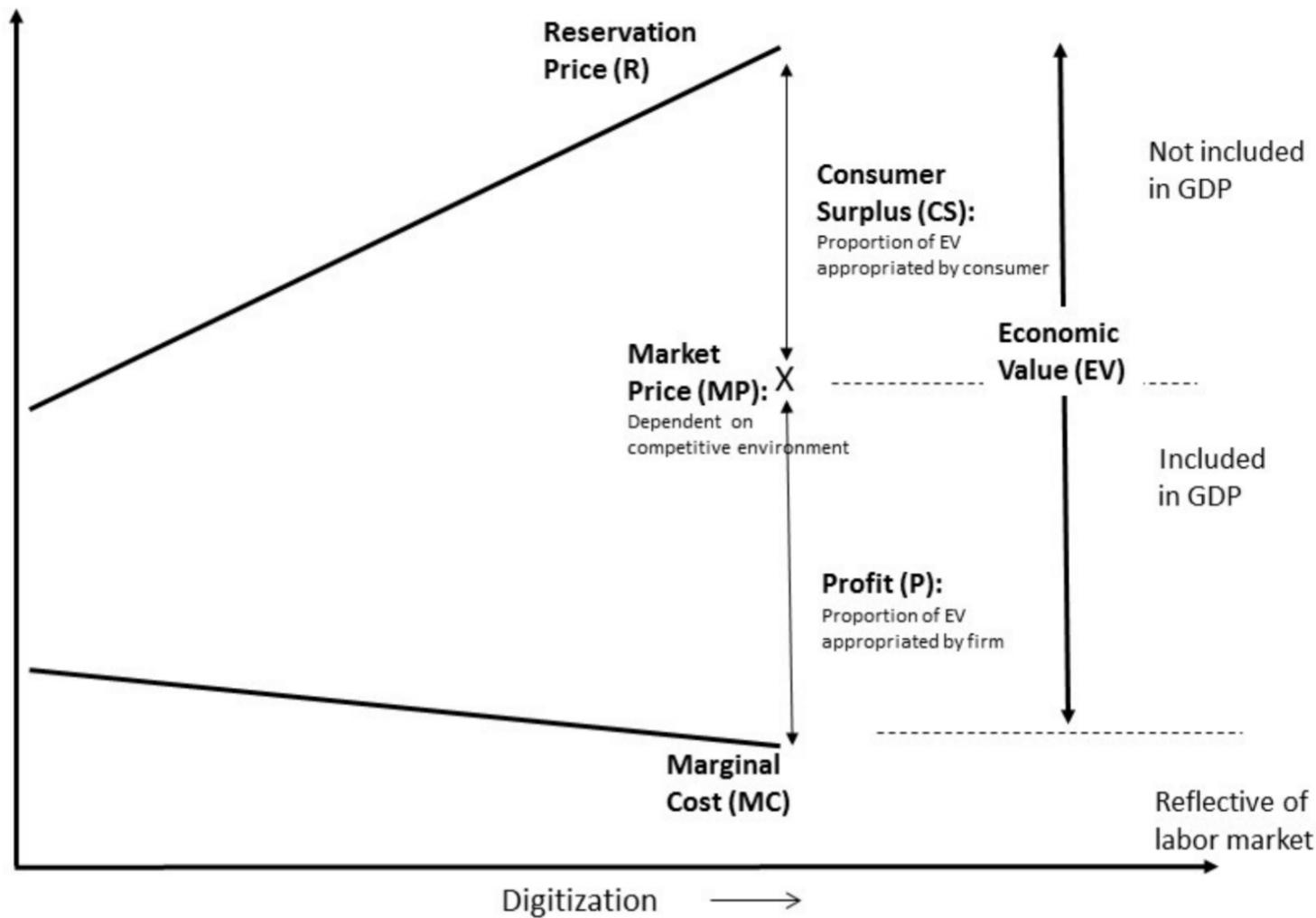


This value is appropriated in 2 parts (CS & P):

*Value appropriated to consumers called Consumer Surplus (CS) =
Reservation Price (R) – Market Price (MP).....(1)*

*Value appropriated to firm (i.e., profit (P)) =
Market Price (MP) – Marginal Cost (MC)..... (2)*

Understanding the Economic Value of Digitization



Understanding the Economic Value of Digitization

Why do firms invest in digitization or digital initiatives?

Implementing a digitization project	Is expected to lead to	Which leads to an increase in Economic Value (EV)
<ul style="list-style-type: none">• automating a process• developing an analytics application• providing customer service kiosks• providing an application• enhancing features of an application or a website• using or providing social media	<ul style="list-style-type: none">• An increase in Reservation Price (R)• A decrease in Marginal Cost (MC)	Because Economic Value (EV) is calculated as Reservation Price (R) – Marginal Cost (MC)

Economic Value (EV) created by a firm = Reservation Price (R) – Marginal Cost (MC)

The emergence of CDOs

[not to be confused with CD(ata)O]

- ▶ Many companies that go through a digital transformation have introduced the leadership role of ***chief digital officer (CDO)***
- ▶ CDOs are employed to make digital transformation a strategic priority
- ▶ The CDO orchestrates the digital transformation of a company by formulating and executing a dedicated digital transformation strategy
 - ▶ aka "*Chief Digital Strategy Officer*"



The role of the CDO

- ▶ In some organizations the role of the CDO is on the strategic level, while on other organizations, CDO responsibilities are more tactical
- ▶ Some organizations put CDO in charge of leading product and service innovation
 - ▶ However, some organizations still address digital innovation through existing CIOs
- ▶ Overall, organizations appoint a CDO to drive business value from digital technologies



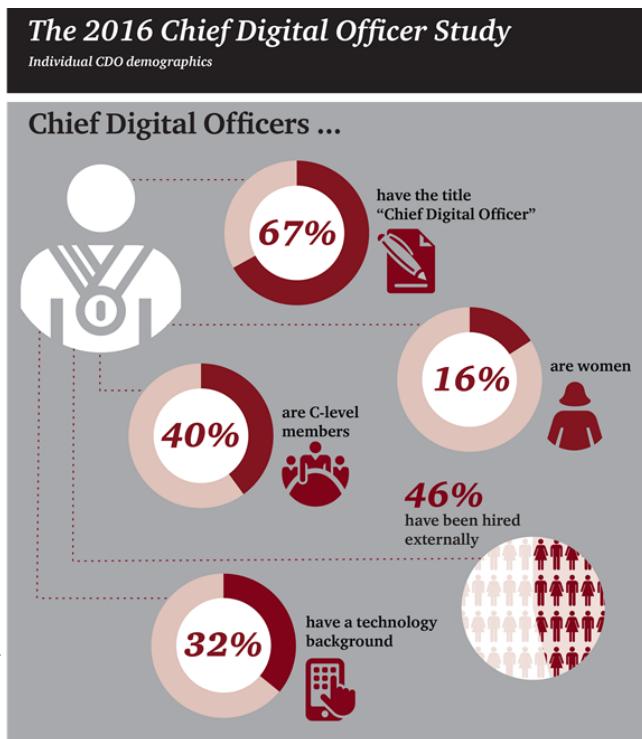
Characteristics of a Successful CDO

- ▶ Successful in using various classes of digital technologies to generate value
- ▶ Focus on seizing new opportunities
- ▶ Use data to question the existing business model and evaluate customer-centeredness
- ▶ Be well-verses in experimenting with, and applying, a variety of digital technologies
- ▶ Actively sense the environment for emerging digital technologies, and exploiting them to build digital capabilities in their organizations

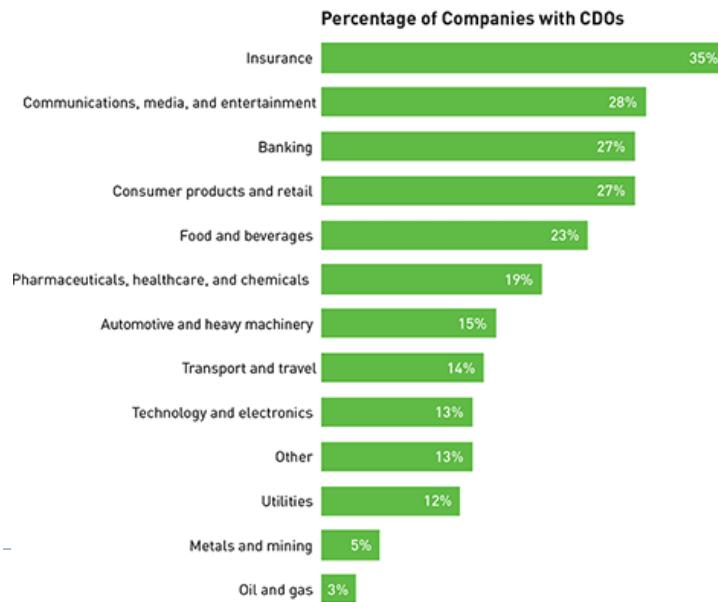


PwC CDO Study 2016

- In a 2016 study of CDOs by PwC, which analyzed the presence of such leaders among the world's 2,500 largest public companies, revealed that 19 percent of these companies have now designated an executive to lead their digital agenda
 - This number is up from just 6 percent of companies in the 2015 study. The two charts below show the demographics of CDOs and the percentage of the 2,500 surveyed companies with a CDO.



Digital Leaders by Industry
In the insurance; communications, media, and entertainment; consumer products and retail; and banking industries, more than a quarter of companies have appointed a CDO.



Source: Strategy&

- ▶ IDC has predicted in 2014 that “By 2020, 60% of CIOs in global organizations will be supplanted by the CDO for the delivery of IT-enabled products and digital services.”

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Ambition Singapore
Singapore
We're looking for a candidate to this position in an exciting company. Min 4 years' leadership experience managing a cross-functional ...
2 weeks ago

Chief Digital Officer
jobleads.com - Careers for Senior-Level Professionals
Singapore
We're looking for a candidate to this position in an exciting company. Min 4 years' leadership experience managing a cross-functional ...
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Chief Digital Officer (Data & Technology)
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Chief Digital Officer (Data & Technology)

- managing analytics, engineering and product team
- regional coverage and opportunity to develop further
- established startup with strong financial support

My client is currently looking for a CDO with strong expertise in both technology and business to plan and own technology roadmap (across data analytics, product management, engineering), drive technology strategy, build data-intensive software, overseeing deployment of algorithms and models, developing cutting edge tech stack to meet business demand. This leader must manage a team of data scientist, data engineer, solution architects, product team of 20-30 people across the region. This is a regional role with 3 senior manager level direct reports.

Qualifications

- Min 12 years experience in development and application of machine learning, data mining, and statistical analysis
- Min 4 years' leadership experience managing a cross-functional team in software engineer or data analytics or both
- Excellent coding skills in python, R, C++, Java, Scala languages, algorithms implementations etc
- Strong business mindset with high level strategic thinking
- Excellent project management skills
- Excellent client facing experience and problem solving mindset
- Excellent experience in dealing with internal and external customers
- Passionate about data analytics, data mining, analysis and coding !
- Masters or PhD degree in Computer Science, Machine Learning, Operational Research, Mathematics or Statistics or similar fields

CHIEF INFORMATION OFFICER

Job Description

The Chief Information Officer leads the IT function and provides strategic directions, solutions and policies to support business goals. He/She develops the information strategy and services to meet business requirements including training and upgrading of systems and/or technology knowledge and skills of all staff to improve productivity through information systems. He directs and promotes governance policies and standards in relation to security, quality, risk and project management. He leads important innovation initiatives and has ultimate accountability for the function. He provides the highest level of advice and recommendations to the heads of organisations or business units. He has the ability to leverage on new and innovative technology to develop strategic directions for the IT functions alignment with the organisation objectives.

He is able to propose solutions and influence key stakeholders to drive commitment for initiatives across the organisation.

Use of digital technologies

- Social
- Mobile
- Analytics
- Internet of Things
- Platforms & ecosystems

Critical Work Functions
and Key Tasks

[View details](#)

CHIEF DATA OFFICER/CHIEF AI OFFICER

Job Description

The Chief Data Officer/Chief Artificial Intelligence Officer establishes the organisation's data and artificial intelligence (AI) strategy, and ethics and governance framework, fostering a culture of compliance to data privacy regulations and the Model AI Governance Framework. He/She is accountable for the quality, accessibility, analysis and management of data to inform business strategy, decision-making and drive performance.

He designs initiatives and programs to realise the optimal business value derivable from the organisation's data assets. He formulates data and AI project prioritisation and resourcing strategies and establishes performance measures to evaluate outcomes data and AI-driven solutions. He identifies potential intellectual property (IP) opportunities from analyses and insights from market intelligence reports, and advises the business on infringements against the organisation's IP related to AI solutions. He creates a shared vision and objectives on the use of data and AI in the organisation, building strategic relationships with key business and industry stakeholders to achieve business goals.

The Chief Data Officer/Chief Artificial Intelligence Officer is highly skilled in influencing and engaging stakeholders to secure their buy-in and support. He has strong business acumen, is highly innovative, and is able to make calculated-risk decisions, performing effectively in a complex and difficult environment. He possesses strong leadership and management skills required to develop the organisation's data and AI capabilities.

Critical Work Functions
and Key Tasks

[View details](#)

$CD(\text{igital})O = \text{part CIO} + \text{part CD(ata)}O ??$





Chief Digital & Technology Officer (Singapore)

Pizza Hut · Singapore, Singapore

2 weeks ago · ⓘ Over 200 applicants



[See who Pizza Hut has hired for this role](#)

[Apply on company website](#)

Save

The role

The Chief Digital & Technology Officer ("CDTO"), Pizza Hut Asia Pacific is a newly created role designed to take Pizza Hut to the next level and revolutionize the way Franchise businesses manage their digital and technology business.

We are looking for a Chief Digital & Technology Officer with a proven track record in leading digital transformation and adoption of technologies across an organization. This role will be responsible for transforming business strategy using technology and data, and championing how people, processes, and technology can enable that digital vision. Be part of a fun, fast paced and supportive culture, where all our success comes from our belief in people and investing in our top talent.

As an established digital leader, you will have the skills to influence at every level imparting your digital knowledge and skills in a constructive, empowering, and collaborative way. You will be responsible for leading and developing the Technology team in Asia Pacific. As a member of the APAC Leadership Team, be working closely with other functional Senior Leaders and our franchise community. Your goal to drive growth and strategic renewal by transforming the organization's traditional analog business into digital. CDTO's focus on creating new value through the smart use of digital tools, platforms, technologies, services, and processes.



Innovation Leadership

Leadership

A process by which an individual or group creates direction, alignment, and commitment for their shared work.

Innovation Leadership

A process for creating direction, alignment, and commitment needed to create and implement something new that adds value.

Fostering Innovation as a Leader

Effective innovation leadership has three essential building blocks:

1. TOOLSET

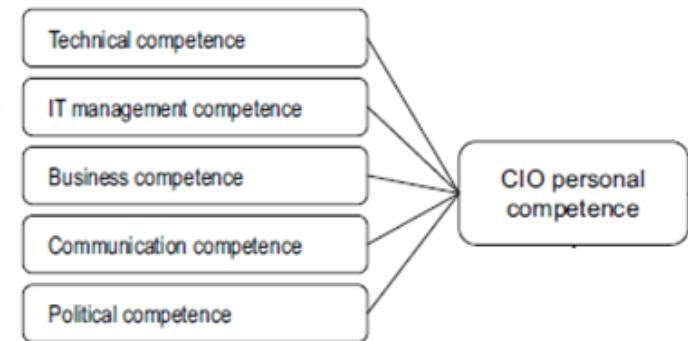
The collection of tools and techniques used to generate new options, implement them in the organization, communicate direction, create alignment, and cause commitment.

2. SKILLSET

A framework that allows innovation leaders to use their knowledge and abilities to accomplish their goals. More than tools and techniques, it requires facility, practice, and mastery of processes.

3. MINDSET

The attitudes and resulting behaviors that allow the tools and skills to be effective. The mindset is the fundamental operating system of the creative thinker and distinguishes those leaders who enable creative thinking and innovation from those who shut it down.



How Microsoft Uses a Growth Mindset to Develop Leaders



Believes that

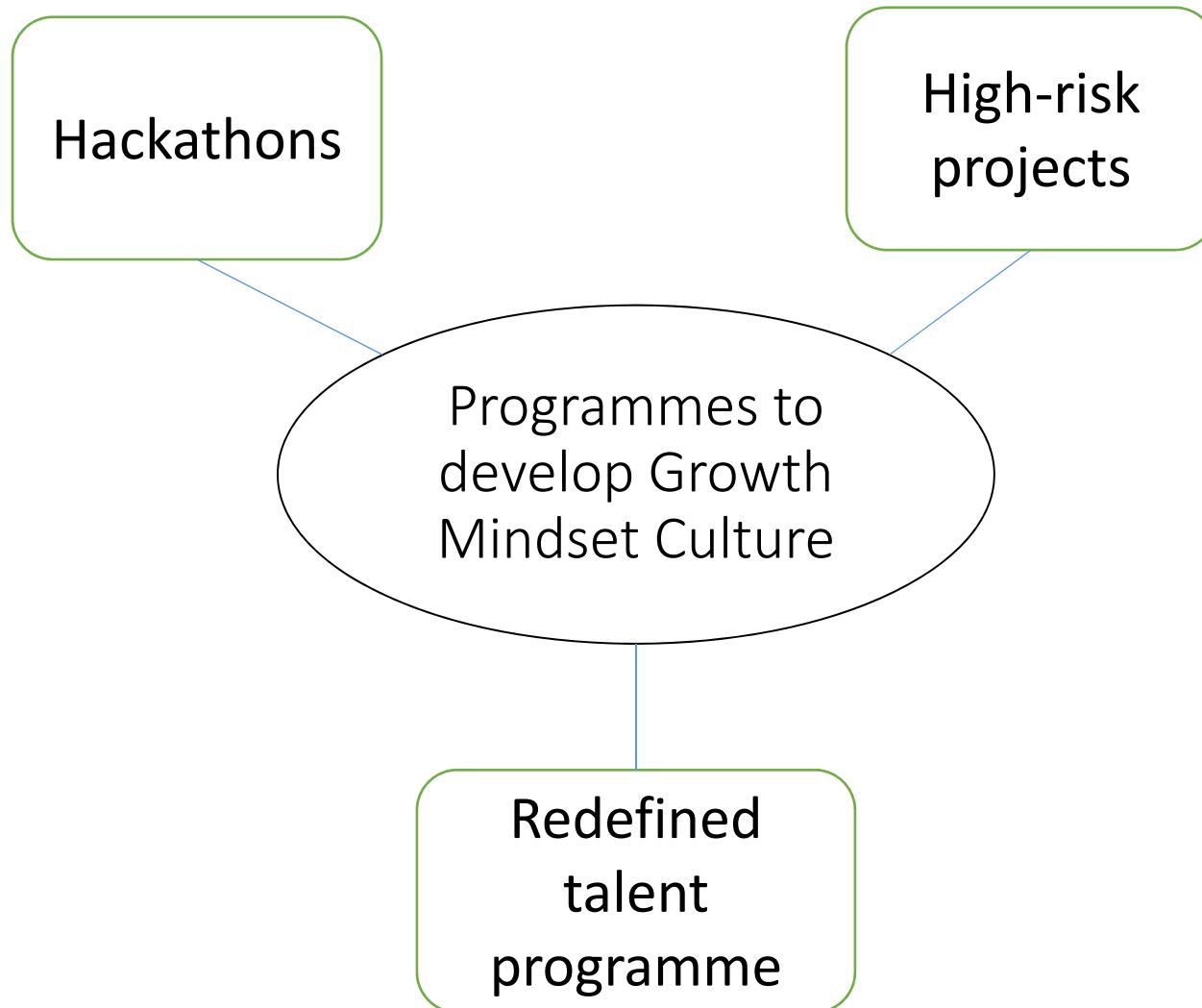
- Talent should be developed in everyone
- Not viewed as a fixed innate attribute ("fixed mindset")

When a company adopts growth mindset

- Managers see more leadership potential in employees
- Previously unidentified yet skilled leaders can progress to positions higher than traditional development model

Development of Growth Mindset Culture

At Microsoft



Hackathon

- ❖ Employee creates a team for a hack (idea with business or societal merit)
 - Other employees can apply to join the team
 - Develop the business plan
 - Create prototype
 - Pitch it company-wide
 - Winning team will be funded to build their projects
- ❖ Incentives to join
 - Chance to step outside day job
 - Can develop leadership skills from collaborating across disciplines and advocating for ideas
 - Team members can move into leadership roles (eg. team that created Learning Tools for Onenote are now overseeing product's market expansion)

High-risk Projects

- Projects where risk taking is explicitly rewarded
- Eg. Hololens project began as a risky 'moonshot' goal – when gamble paid off, Microsoft presented team with recognition and rewards
- Microsoft is working on ensuring that *smart risks* are encouraged and rewarded whether these projects succeed or not as long as they yield insights

Redefined Talent Programme

- ❖ Microsoft created a programme called Talent Talks:
 - Each year, CEO and senior leadership team meets with heads of departments
 - Review employees
 - Discuss moving people across teams
 - Brainstorm methods of augmenting skills and building experiences
- ❖ Benefits of Talent Talk:
 - Broader view of up-and-coming talent
 - Provide more effective way of detecting and fostering new leaders
 - Create opportunities of everyone to grow

Is the latest IT innovation the Next Big Thing – or just the Next Big Sell?

As an IS leader...

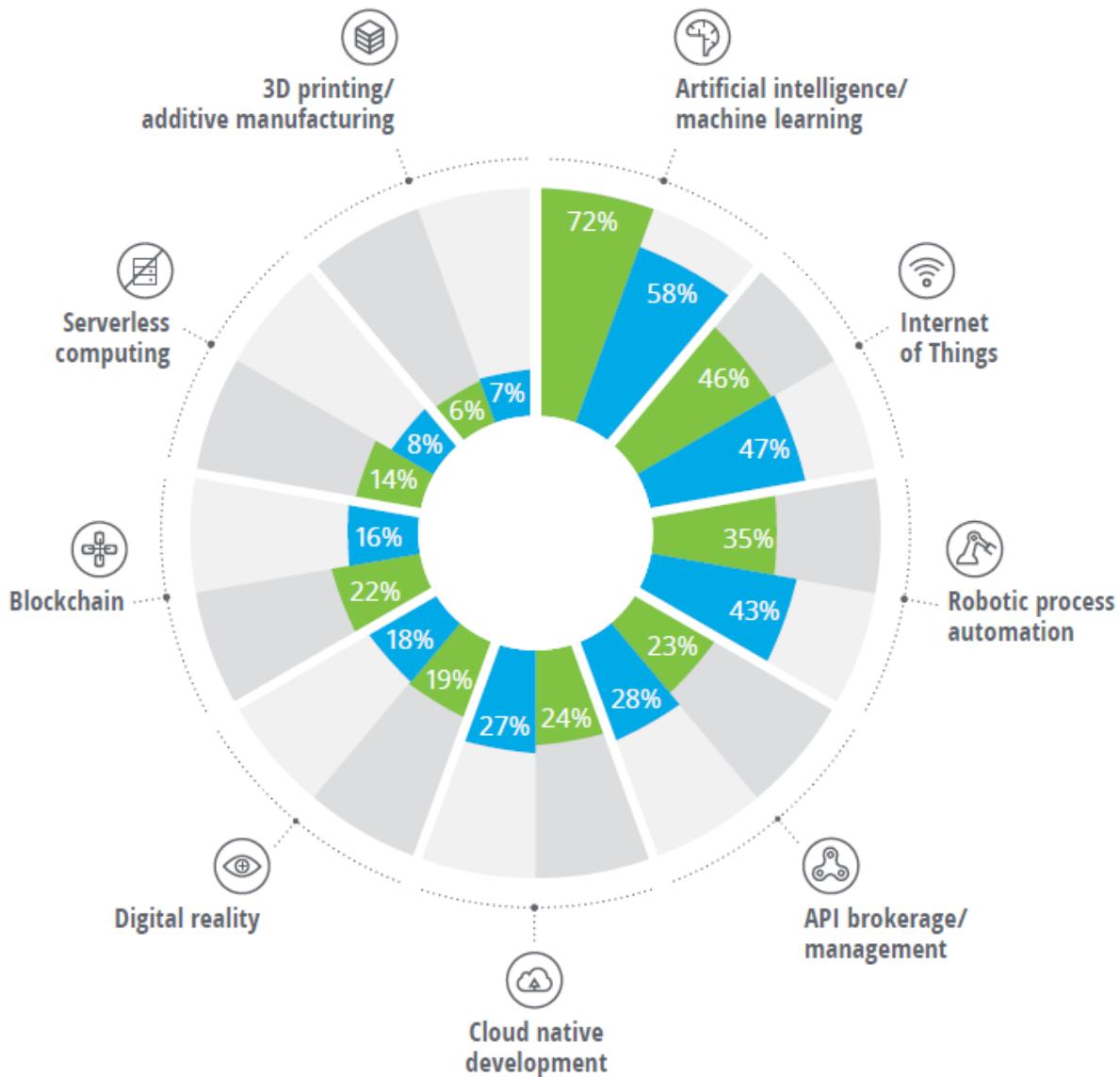
- ▶ How to distinguish between hype and reality?
- ▶ Understanding the dynamics that produce IT innovation waves can help IT leaders make wise decisions about which innovations to adopt and when



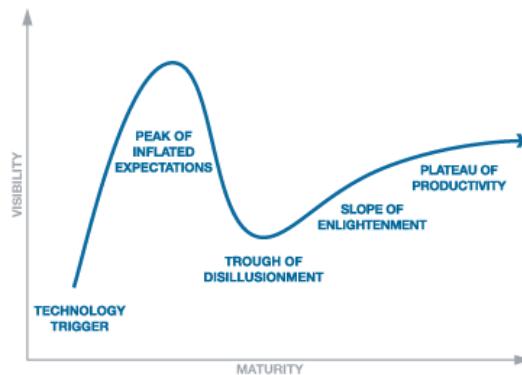
AI, Internet of Things (IoT), and robotic process automation (RPA) are at the top of CIOs' emerging technologies wish list

Which of the following emerging technologies do you anticipate investing in significantly in the next three years? (Please select up to three.)

■ Digital vanguards ■ Baseline organizations

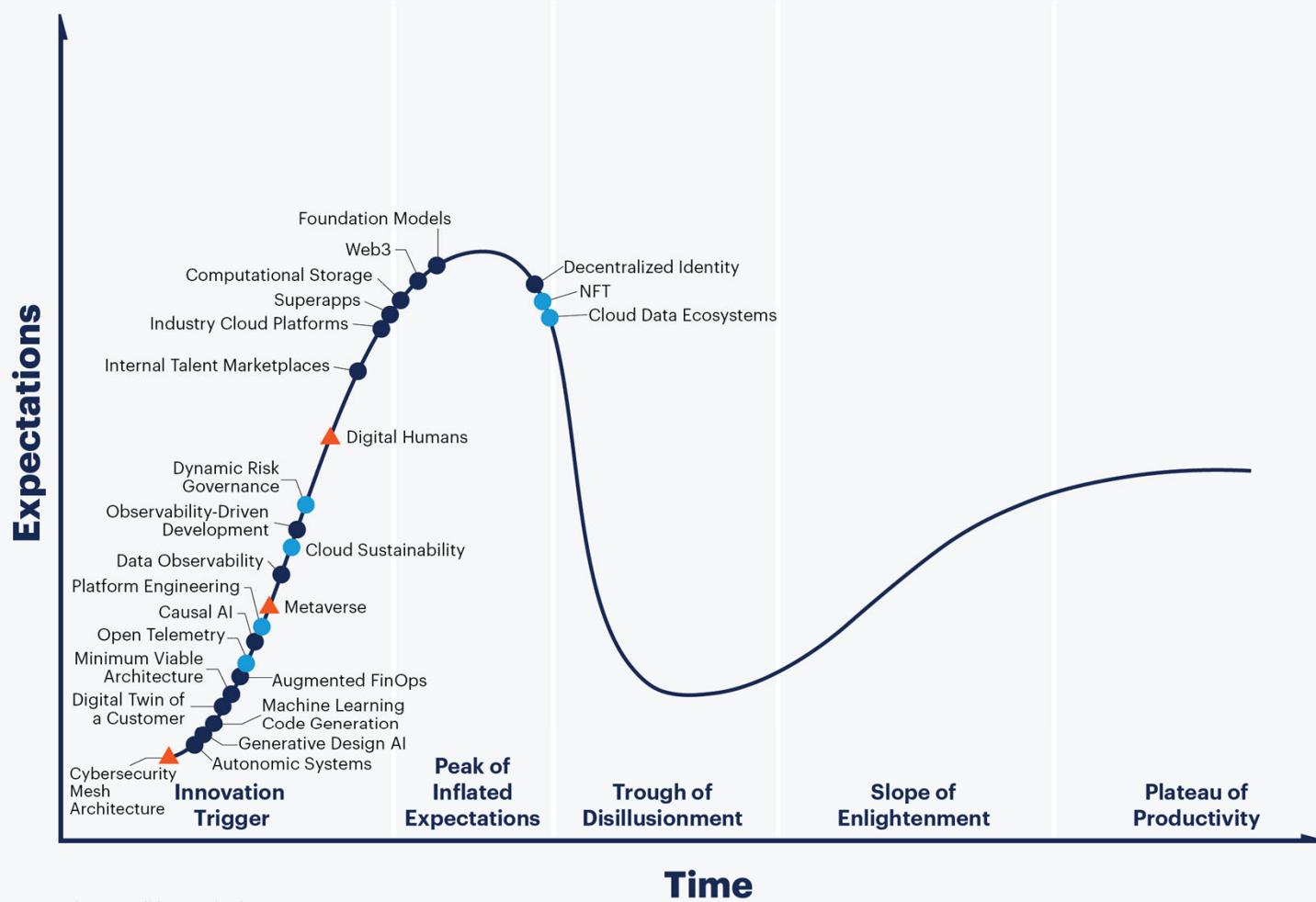


Gartner's Hype Cycle (since 1995)



- ▶ **Technology Trigger:** A potential technology breakthrough kicks things off. Early proof-of-concept stories and media interest trigger significant publicity. Often no usable products exist and commercial viability is unproven.
- ▶ **Peak of Inflated Expectations:** Early publicity produces a number of success stories — often accompanied by scores of failures. Some companies take action; many do not.
- ▶ **Trough of Disillusionment:** Interest wanes as experiments and implementations fail to deliver. Producers of the technology shake out or fail. Investments continue only if the surviving providers improve their products to the satisfaction of early adopters.
- ▶ **Slope of Enlightenment:** More instances of how the technology can benefit the enterprise start to crystallize and become more widely understood. Second- and third-generation products appear from technology providers. More enterprises fund pilots; conservative companies remain cautious.
- ▶ **Plateau of Productivity:** Mainstream adoption starts to take off. Criteria for assessing provider viability are more clearly defined. The technology's broad market applicability and relevance are clearly paying off.

Hype Cycle for Emerging Tech, 2022

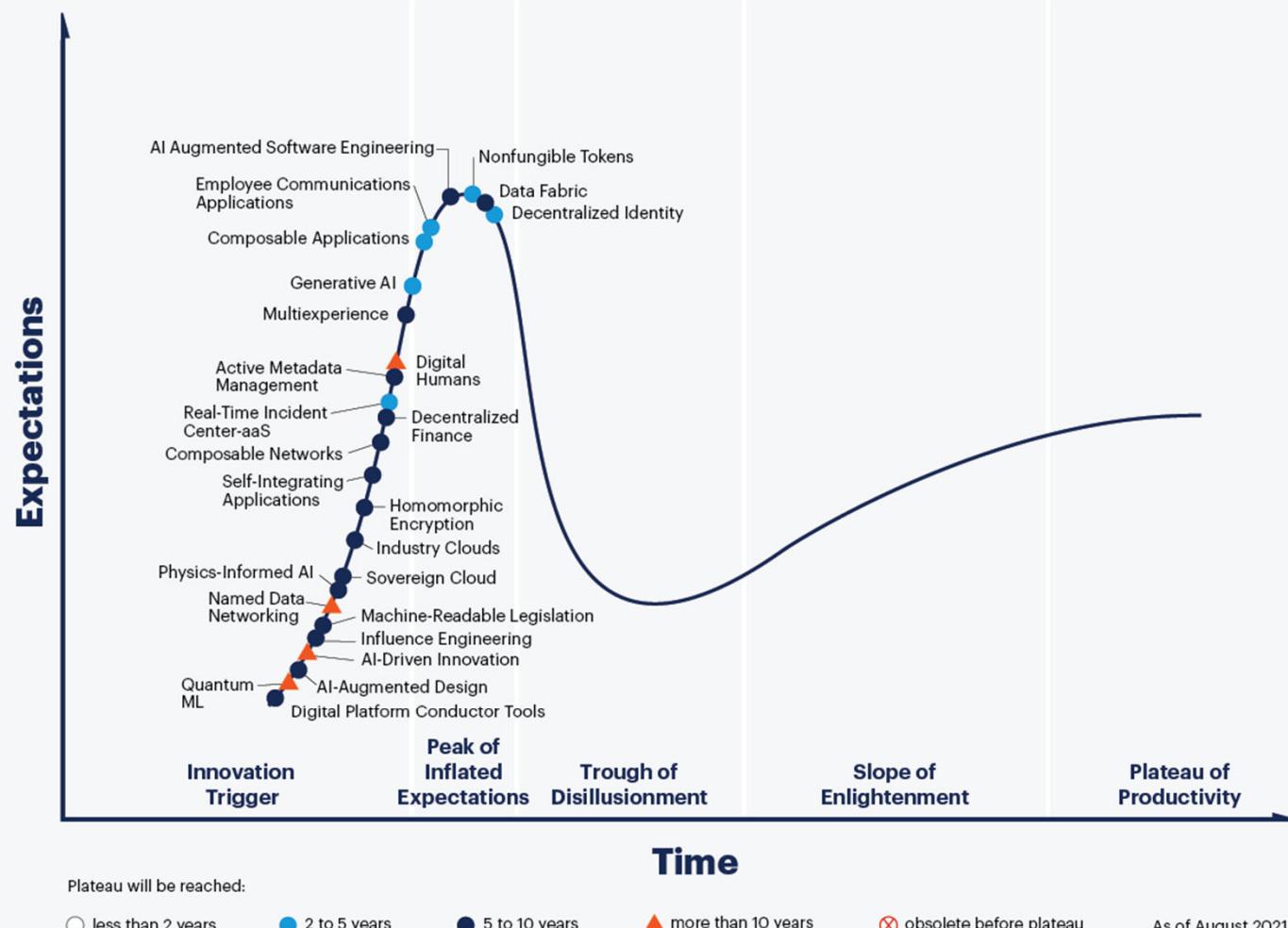


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<https://www.gartner.com/smarterwithgartner/3-themes-surface-in-the-2021-hype-cycle-for-emerging-technologies/>

Hype Cycle for Emerging Technologies, 2020



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Gartner Hype Cycle for Emerging Technologies, 2019



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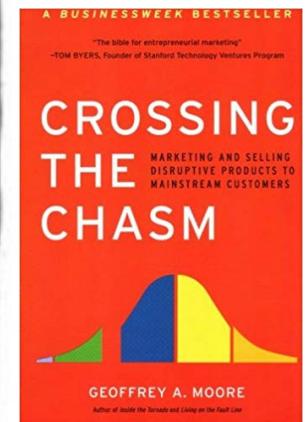
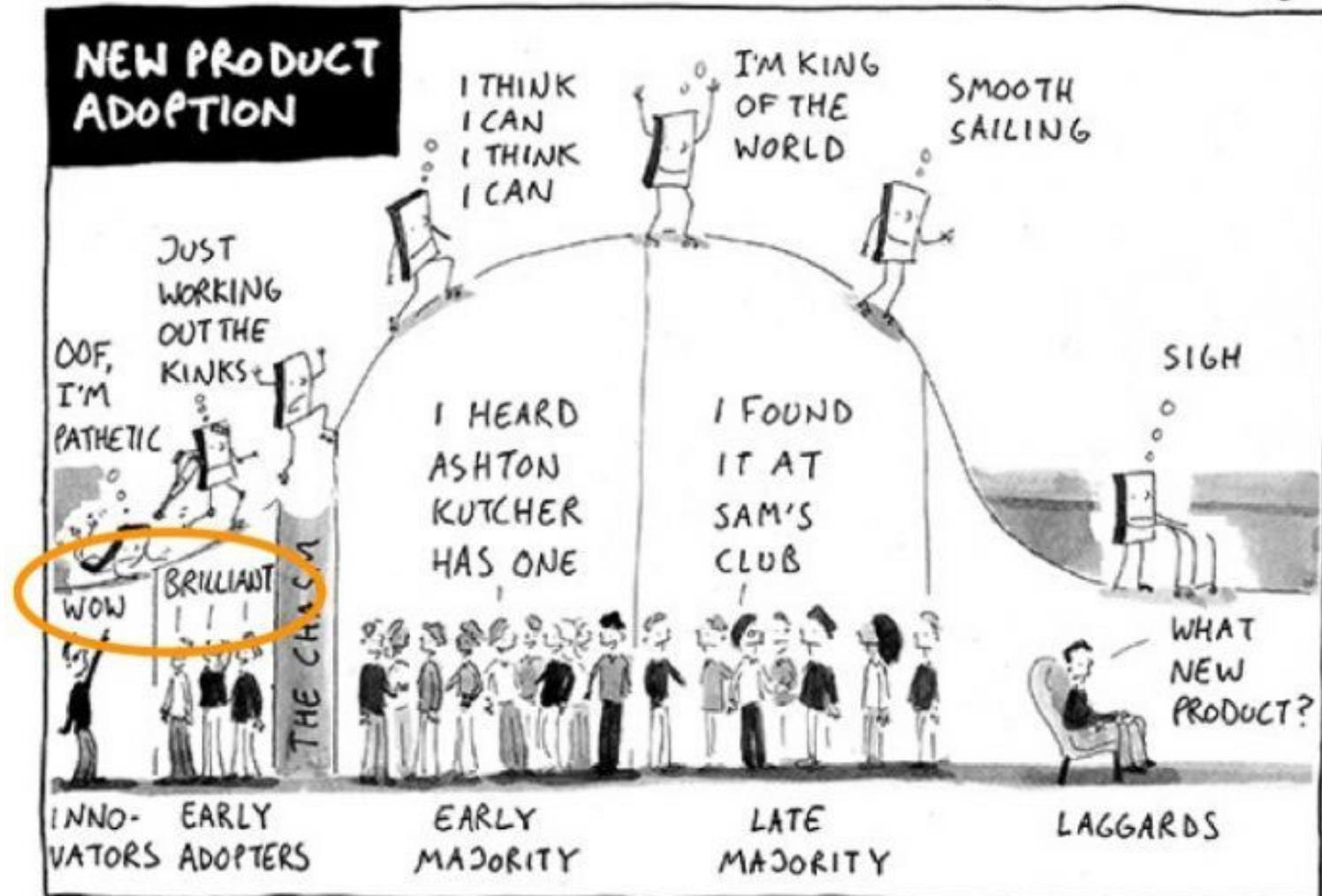
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Gartner

Crossing the Chasm (for consumers/users)

BRAND CAMP

by Tom Fishburne



(Mis)Use of the term “Disruptive Innovation”

- ▶ Use the term loosely to invoke the concept of innovation in support of whatever it is they wish to do
- ▶ Describe *any* situation in which an industry is shaken up and previously successful incumbents stumble



Disruption Theory



January–February 1995 Issue

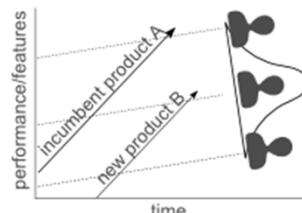


Disruption first discussed in an HBR article published in 1995

Clayton Christensen is the author of 9 books, including The Innovator's Dilemma, and others on healthcare and education



WHAT EVERYONE OUGHT TO KNOW ABOUT DISRUPTIVE INNOVATION



"A disruptive innovation is **not** a breakthrough innovation that makes good products a lot better."
- Clayton Christensen

The Idea

- ▶ “Disruption” describes a process whereby a smaller company with fewer resources is able to successfully challenge established incumbent businesses
 - ▶ As incumbents focus on improving their products and services for their most demanding (and usually most profitable) customers, they exceed the needs of some segments and ignore the needs of others
 - ▶ Entrants that prove disruptive begin by successfully targeting those overlooked segments, gaining a foothold by delivering more-suitable functionality— frequently at a lower price
 - ▶ Incumbents, chasing higher profitability in more-demanding segments, tend not to respond vigorously
 - ▶ Entrants then move upmarket, delivering the performance that incumbents’ mainstream customers require, while preserving the advantages that drove their early success
- ▶ When mainstream customers start adopting the entrants’ offerings in volume, *disruption has occurred*

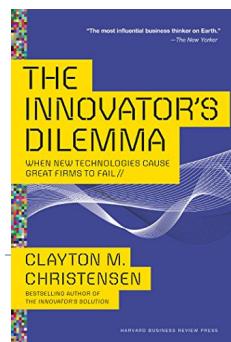


The Disruptive Innovation Model



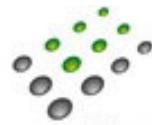
Why Incumbents Get Disrupted?

- ▶ A company's propensity for strategic change is profoundly affected by the interests of customers who provide the resources the firm needs to survive
 - ▶ Incumbents (sensibly) listen to their existing customers and concentrate on sustaining innovations as a result
- ▶ Incumbents' focus on their existing customers becomes institutionalized in internal processes that make it difficult for even senior managers to shift investment to disruptive innovations
 - ▶ The same behaviors that sustain a company—listening to customers and investing in innovations to meet those customers' needs—can ultimately lead to failure
 - ▶ Clayton Christensen called this phenomenon the ***innovator's dilemma***



According to the theory...

- ▶ Disruptive innovations originate in 1) low-end or 2) new-market footholds that incumbents overlook
 - ▶ **Low-end footholds** exist because incumbents typically try to provide their most profitable and demanding customers with ever-improving products and services, and they pay less attention to less-demanding customers
 - ▶ In fact, incumbents' offerings often overshoot the performance requirements of the latter
 - ▶ This opens the door to a disrupter focused (at first) on providing those low-end customers with a "good enough" product
 - ▶ E.g.

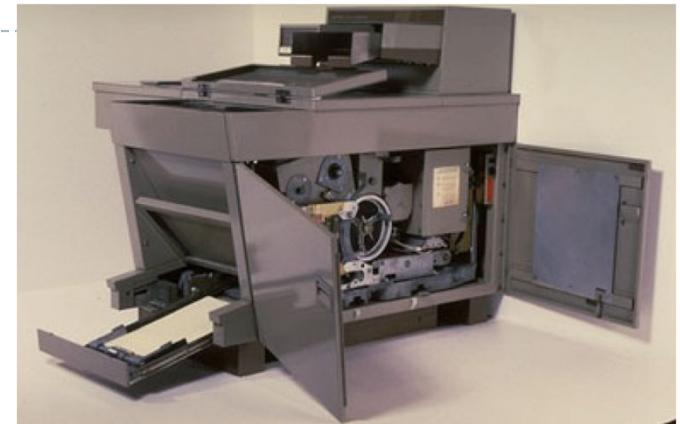


VocalTec





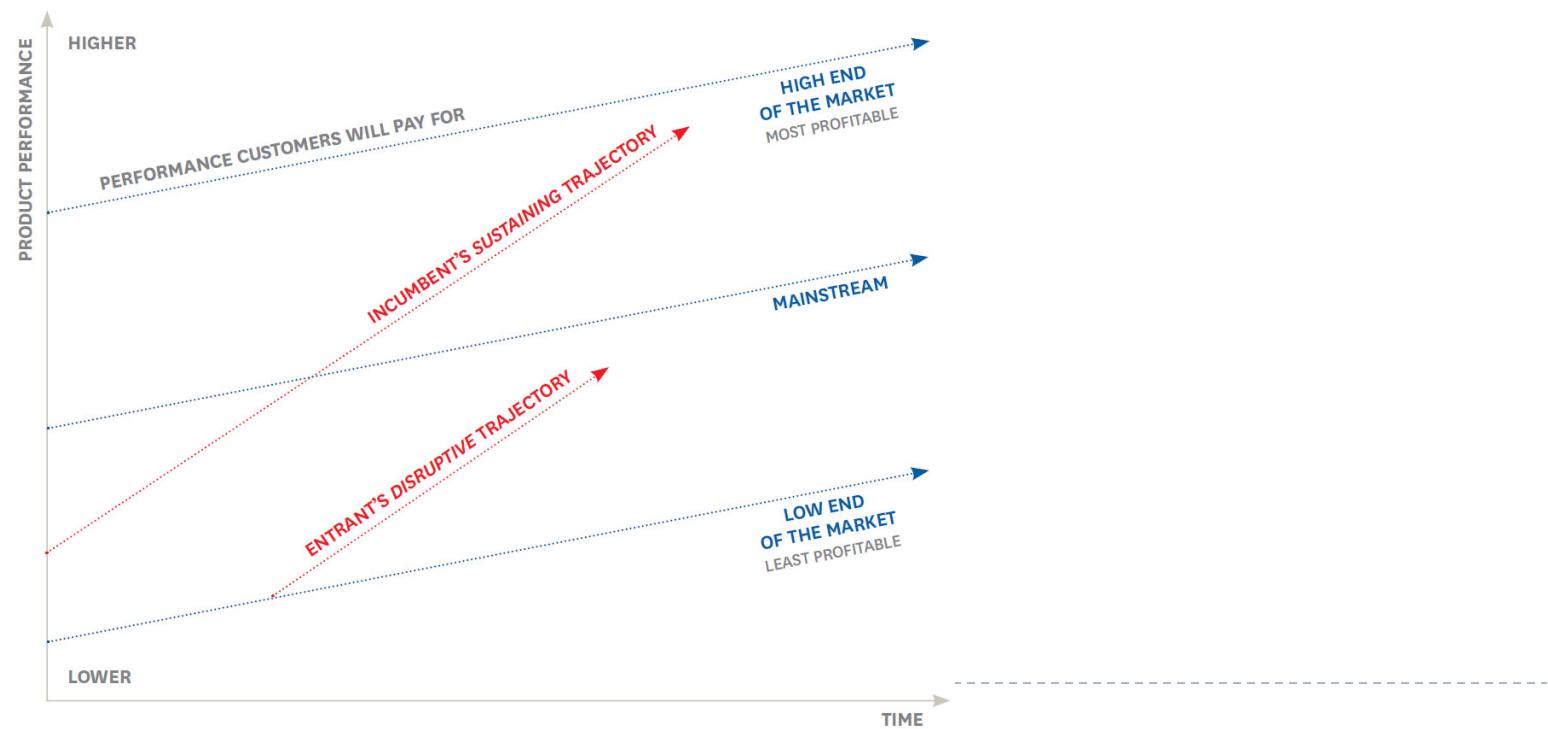
- ▶ In the case of ***new-market footholds***, disrupters create a market where none existed
 - ▶ They find a way to turn non-consumers into consumers
 - ▶ For e.g., in the early days of photocopying technology, Xerox targeted large corporations and charged high prices in order to provide the performance that those customers required
 - ▶ School librarians, bowling-league operators, and other small customers, priced out of the market, made do with carbon paper or mimeograph machines
 - ▶ Then in the late 1970s, new (Japanese) challengers introduced personal copiers, offering an affordable solution to individuals and small organizations—and a new market was created
 - ▶ From this relatively modest beginning, personal photocopier makers gradually built a major position in the mainstream photocopier market that Xerox valued



Canon



- ▶ Low-end and new-market footholds are populated not by a lone would-be disrupter, but by several *comparable* entrant firms whose products are simpler, more convenient, or less costly than those sold by incumbents



Are these incremental or **disruptive innovations?**

1. Online learning - Massive Open Online Courses (MOOC)
 2. Digital music (MP3 format)
 3. AirBnB
 4. Microfinance
 5. Online shopping
 6. Wikipedia
 7. Online Food delivery (Deliveroo/Foodpanda)
 8. Cloud Computing
 9. Digital Photography
 10. Email
 11. Online travel websites (Expedia, Agoda)
 12. Online newspaper / publishing / e-book
 13. Apple Pay / Android Pay (NFC) ; Netspay/Alipay/Wechat Pay (QR code)
 14. Blockchain Ledger Technologies
 15. Autonomous/Driverless Vehicles
 16. Drone Technology
-



Why does this matter to an IS leader?

- ▶ A good knowledge of disruption theory will allow you to see the world differently...
 - ▶ How do we position our firm in the marketplace?
 - ▶ Which competitors should we be worried about?
 - ▶ How do we respond to competitors on the low-end?
 - ▶ How do we become the disruptor before we get disrupted?
 - ▶ Where do we look for new growth opportunities?



Key Takeaways and Reflection Points from Lecture 5

- ▶ What are ambidextrous organizations and how to design organizational structures that promote innovation?
- ▶ What are the building blocks of digital transformation and digitization process?
- ▶ What are the roles of a Chief Digital Officer (CDO) in organizational innovation?
- ▶ How can IS leaders make use of the Gartner Hype Cycle and Disruption Theory to make innovation investment decisions?

