DIGITAL DECODED

Learnings on Digital Transformation based on books and own experiences

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Introduction | Capability building | IT & Strategy | Organisational agility | Approach | Accelerators

Digitalisation

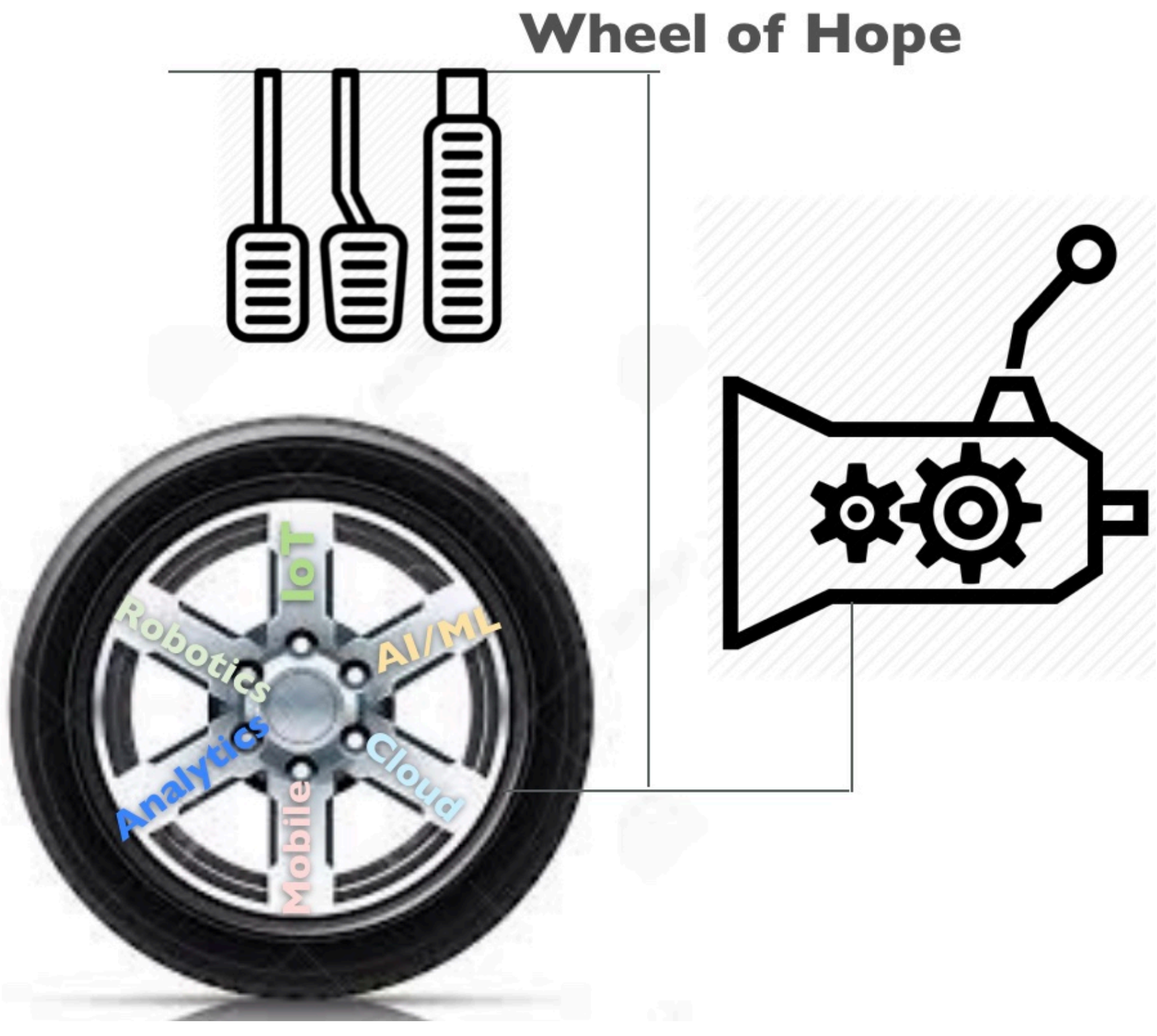
Cheaper and better technologies are leading to creation more connected world by 2030 the number of expected connected devices is 1 trillion. The reducing cost of new technologies leads to new applications and opportunities to combine them in innovative ways. The combination affect of technologies including Mobile, Cloud, Sensing, IoT, AI, to name a few are accelerating the progress exponentially. Technology is a multiplier.

Drivers of digital investments are new efficiencies, customer experiences and outcomes and new business models.

What is different about digital business?

Digital business is the creation of new business designs by blurring the digital and physical worlds. In most cases. In most cases the organisation has taken digital to the core of its products and services to deliver new type of customer value. (Gartner)

Ref: World Economic Forum, 'Digital Transformation Initiative', 2018.



Organisation

Technologies: The technologies like Mobile, Cloud, Analytics, Robotics, AI/ML and IoT can be seen as spokes of the wheel.

Touchpoints: Like tyres and gear shift etc, User interfaces in various forms ranging from touch to voice can be considered key elements of customer experience.

Accelerators: Like accelerator and gears, Digital thread, Digital twin and hackathons can be seen as indirect mechanisms to accelerate towards better customer experience.

Digitalisation

Mobile: 83% of CEOs see it as important.
Cloud: manufacturing is expected to increase cloud penetration.logic monitor survey produce 41% of the enterprise Workloads to run on public cloud in 2020.
IOT: 75% of large manufacturing operations and update and use IoT and Analytics for increasing the flexibility.
Other Technology areas like robotics, a AI/ML are also set to increase their penetration.

Can I hang on without going digital?

Most businesses in digital age may be affected and revenues shrinking due to new entrants like start ups. Your business can as well be disrupted if necessary steps to digital are not taken.

Ref: PTC report

Unlocking the Value of Digitalisation

It is apparent that

1. Every product or service will be digitally remastered.
2. Anything can be digitised.
3. Precision response and control are key to value.
4. Every industry will be remastered.

Digital remasters of an industry takes place in parallel at 2 levels:

1. Change of the firms the dictate the industry directions otherwise called Masters.
2. An upgrade or reinvention of the product or service its self via new core competencies.

Products and services will be transformed. Physical products today Can be significantly enhanced by a combination of the following digital elements like sensors, Display send indicators, actuators and manipulators, Micro controllers, on-board analysis, memory, wireless connected services, Remote control to name a few.

The industry boundaries are blurred by digital substitution, Every company needs to be a technology company. New industries will emerge from the blur. Digital disorders and remaps barriers to entry. It is important to be healthy paranoid, prepared to make take a technology acquisitions, claim your stake in your new industry platform. It is required to be open and be at step ahead off boundary blurring. This is the reason we look at concept of competition instead of focusing on few competitor companies.

Digital Mastery

Digital masters possess
- A strong, overarching digital vision
- Excellent governance of silos
- Many digital initiatives adding business value
- A strong digital culture

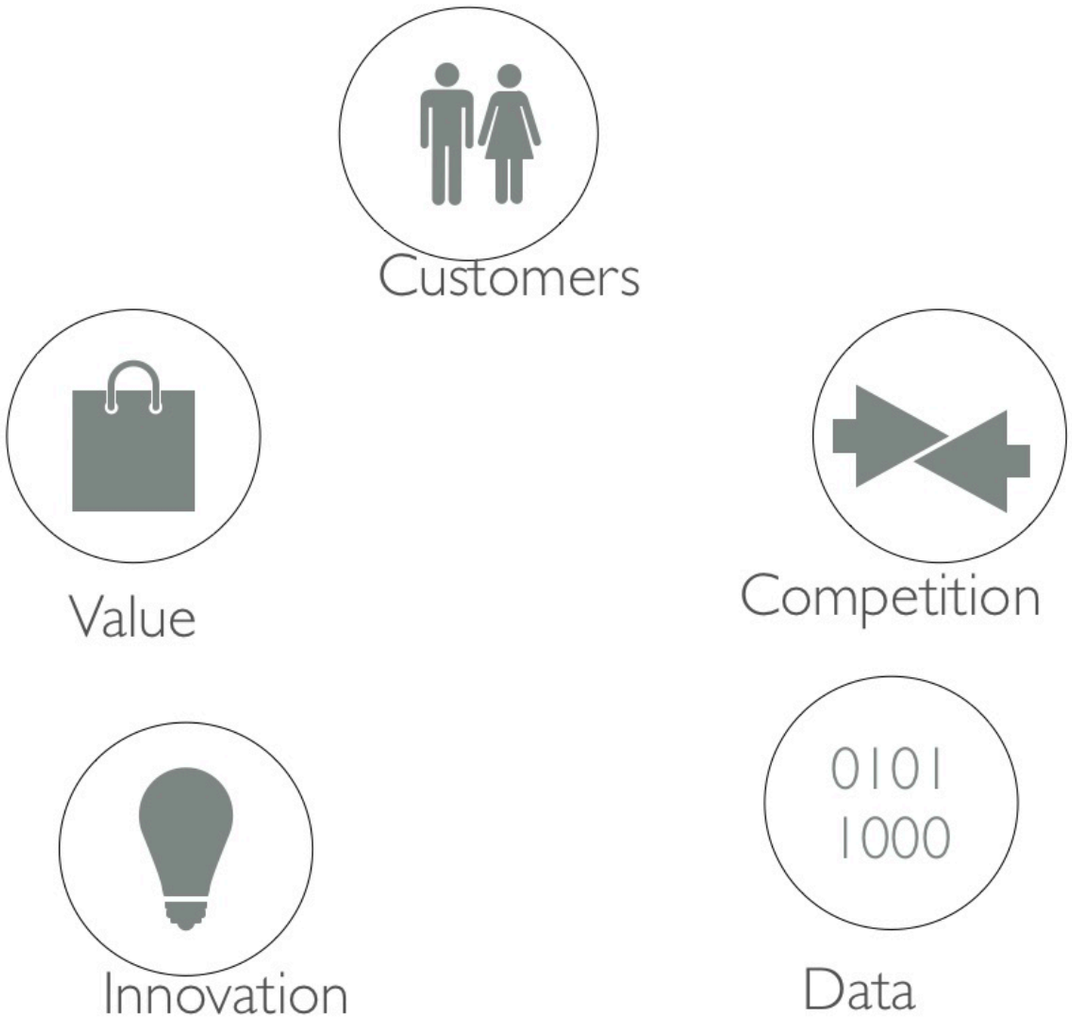
Why everyone aspires to be a digital master ?

1. Outperform industry peers by 6-9%.
2. More profitable compared to competition by 16%.
3. Manage less inventory and can work with digital assets.

What do digital masters do differently ?

- Customer experience from outside in.
- Use digital technology to increase reach and engagement and do smart investments in new digital channels .
- They put customer data at the heart of the whole customer experience.
- Digital masters work to seamlessly mesh physical and digital experience leading to enhanced customer experience, leveraging valuable existing assets.

Key considerations



The five domains of digital transformation involves:

1. Customers
2. Competition
3. Data
4. Innovation
5. Value

Today customers need to be seen as a network connected and interfacing in ways that change the relationships to business. There is a need to rethink traditional marketing funnel and re-examining customers path to purchase.

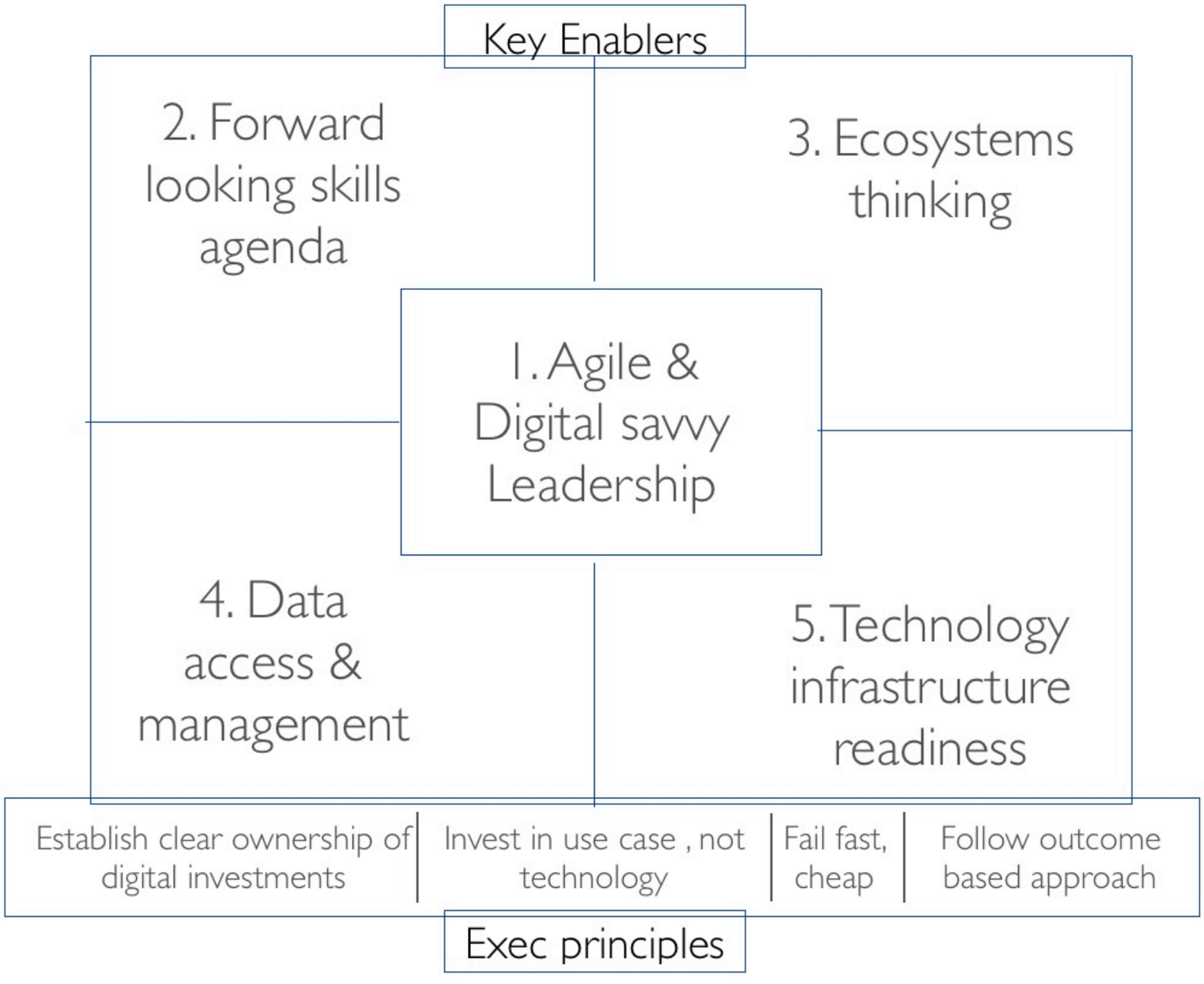
Competition needs to consider that the industry boundaries are now fluid and biggest challenge is the asymmetric competition outside industry. Digital technology supercharges power of platform business. There is a shift in the locus of competition.

In terms of data, the change needs to be seen from how businesses produce, manage and utilise information. The new data deluge and these big data tools allow new kind of predictions, uncover unexpected patterns of business activity and unlock new sources of value.

In case of innovation, digital technologies enable a different approach to innovation based on continuous learning and experimentation. Products developed iteratively saves time and cost of failure and improves organisational learning.

Business delivers a value proposition to its customers. Traditionally firm's business value is constant. But today in digital age only sure path is of constant evolution. Looking to every technology as a way to extend and improve value proposition to customers. Adapting early means staying ahead of the curve.

Building Capabilities



World Economic Forum initiative discusses five key enablers :

1. Agile & Digital savvy leadership
2. Toward looking skills agenda.
3. Ecosystems thinking
4. Data & Access Management
5. Technology infrastructure readiness

The four key principles for execution considers clear ownership, investing in use cases, failing fast and following an outcome based approach.

The capability building can be seen from the perspectives of digital and leadership.

Building digital capabilities

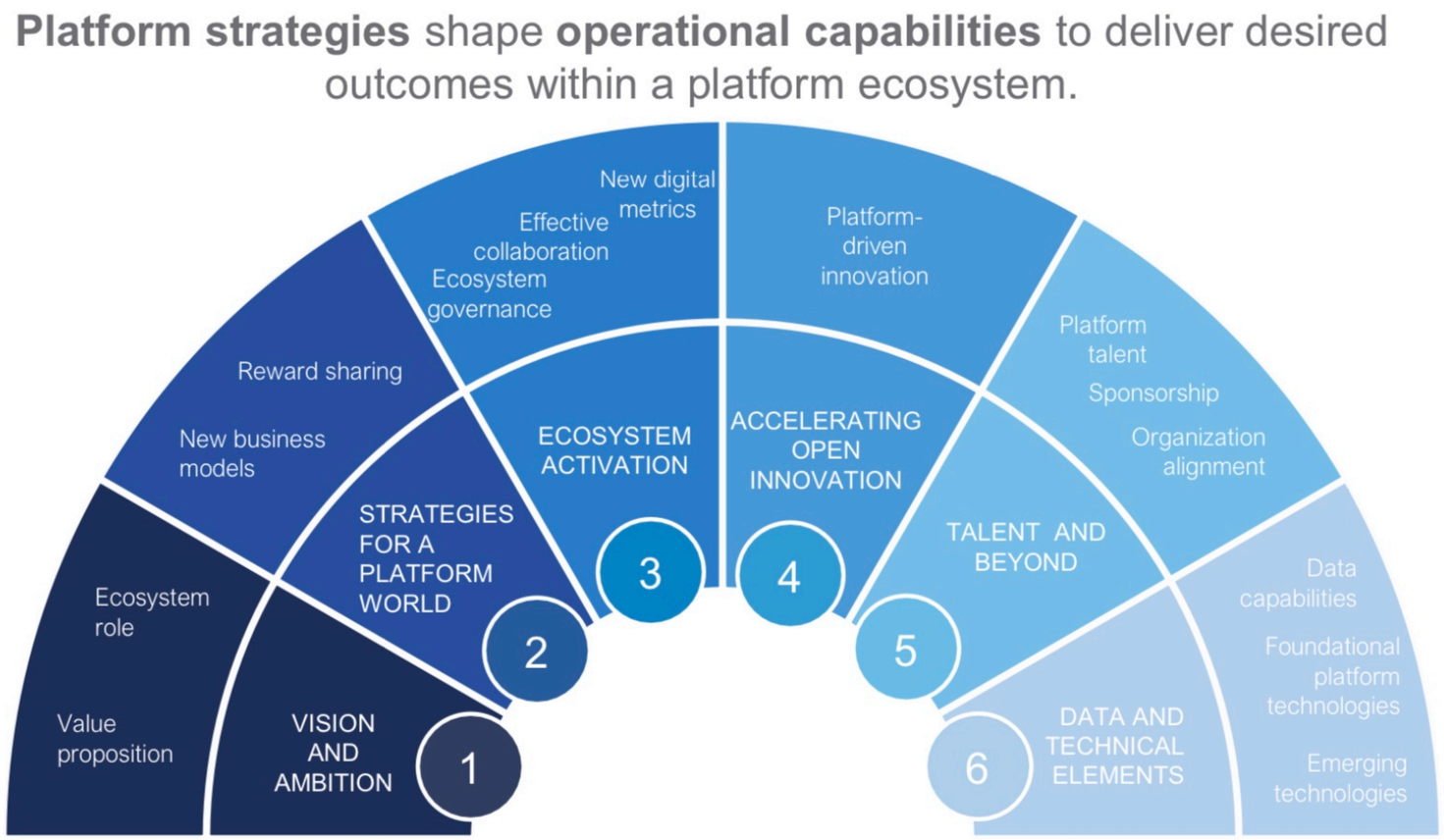
1. Creating a compelling customer experience
2. Exploring the power of operations
3. Reinventing business models

Building leadership capabilities

1. Crafting a digital vision
2. Engaging organisation at scale
3. Governing the transformation
4. Building technology leadership capabilities

It is important for business leaders to identify the technology tipping point by judging the market and knowing when a key tipping point appears. Business leaders must count for three critical factors when trying to estimate the time in the markets and digital changes just nothing but technological progress, cultural evolution and regulatory developments. When three come into alignment new markets are created and they often grow suddenly and rapidly. Leaders need to estimate when it will happen and take advantage.

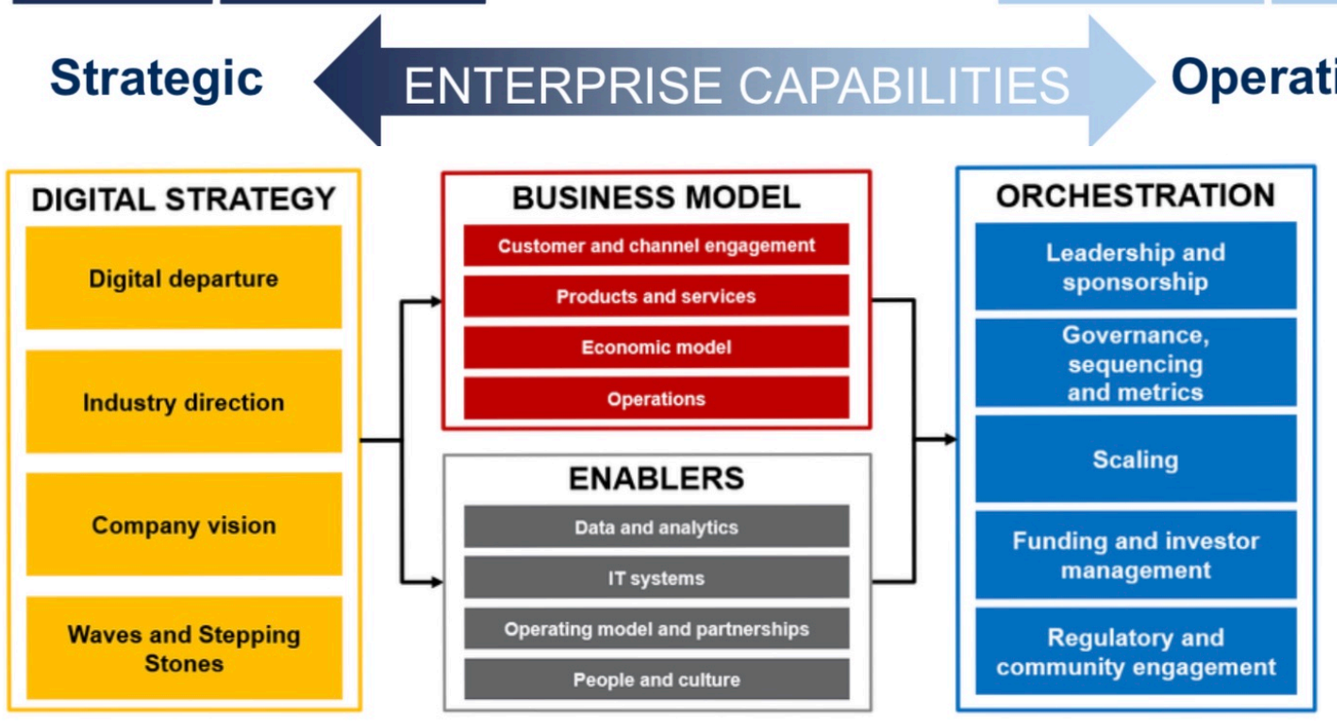
Platform Strategies and operational capabilities



The capabilities required are seen from angles of strategic, operation and internal architecture based on platform and ecosystem.

Platform which is one way of approaching product lines considers a set of core assets and variations. This approach enables deep domain knowledge be embedded into the platform. The platform might consider the layers of commoditisation, differentiation and experimentation and provide interfaces to support each of these.

Scale, active usage and engagement are considered key metrics in digital getting traction



Building blocks and subtopics for a digital transformation

Image: Digital Transformation Initiative at World Economic Forum

The initiative discusses Strategy, Business model, orchestration with support of enablers as key building blocks for digital transformation

In short, ***Information technology, strategy and organisational agility*** are key areas of transformation. A roadmap preparation approach for these are discussed in next slides

Fundamentally a step by step change in ***Speed, Data and Ecosystems*** is known to enable the transformation. This is detailed in approach slides.

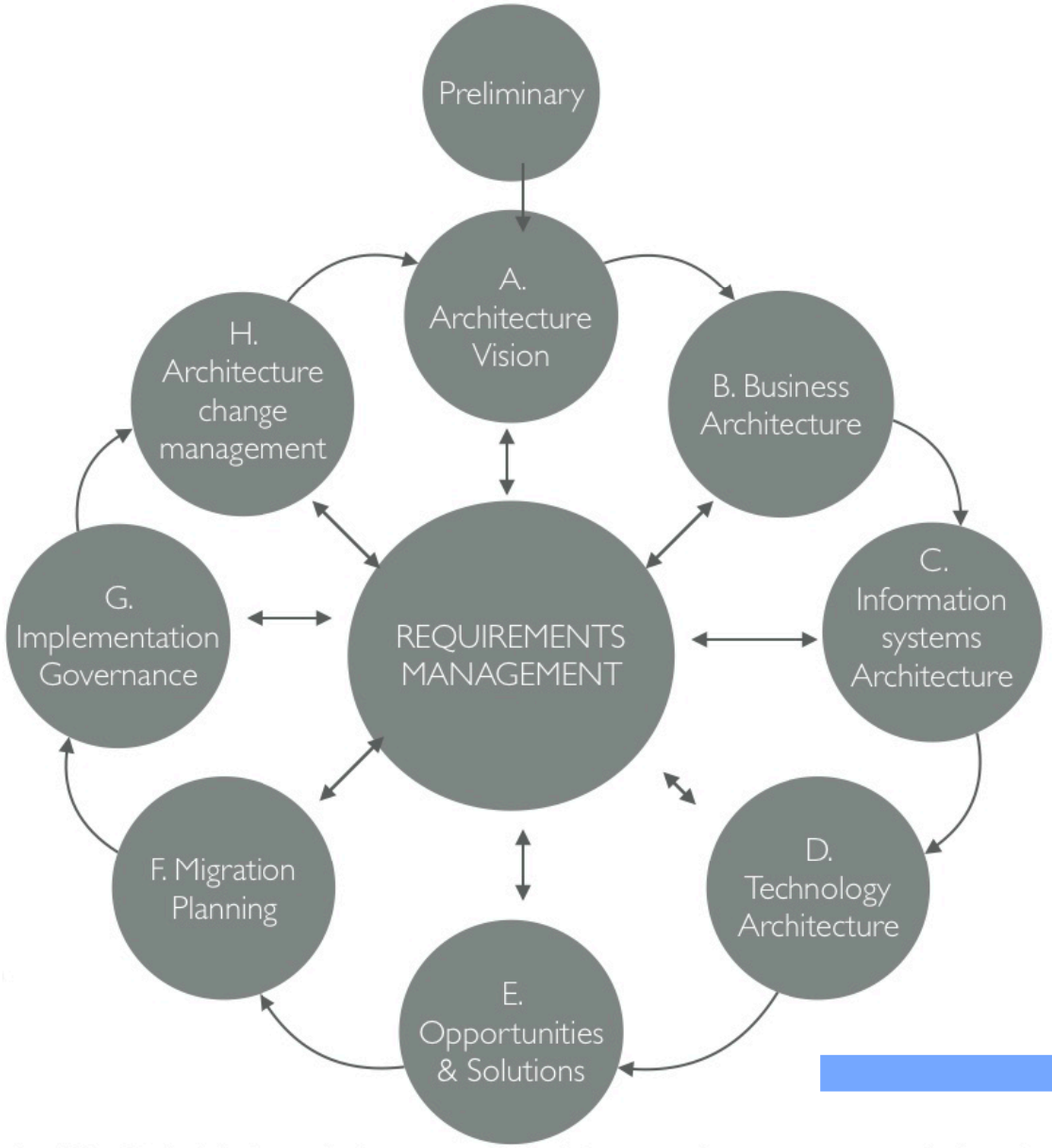
Ref: World Economic Forum, 'Digital Transformation Initiative', 2018.

INFORMATION TECHNOLOGY & STRATEGY

Approach to redefine information technology and strategy

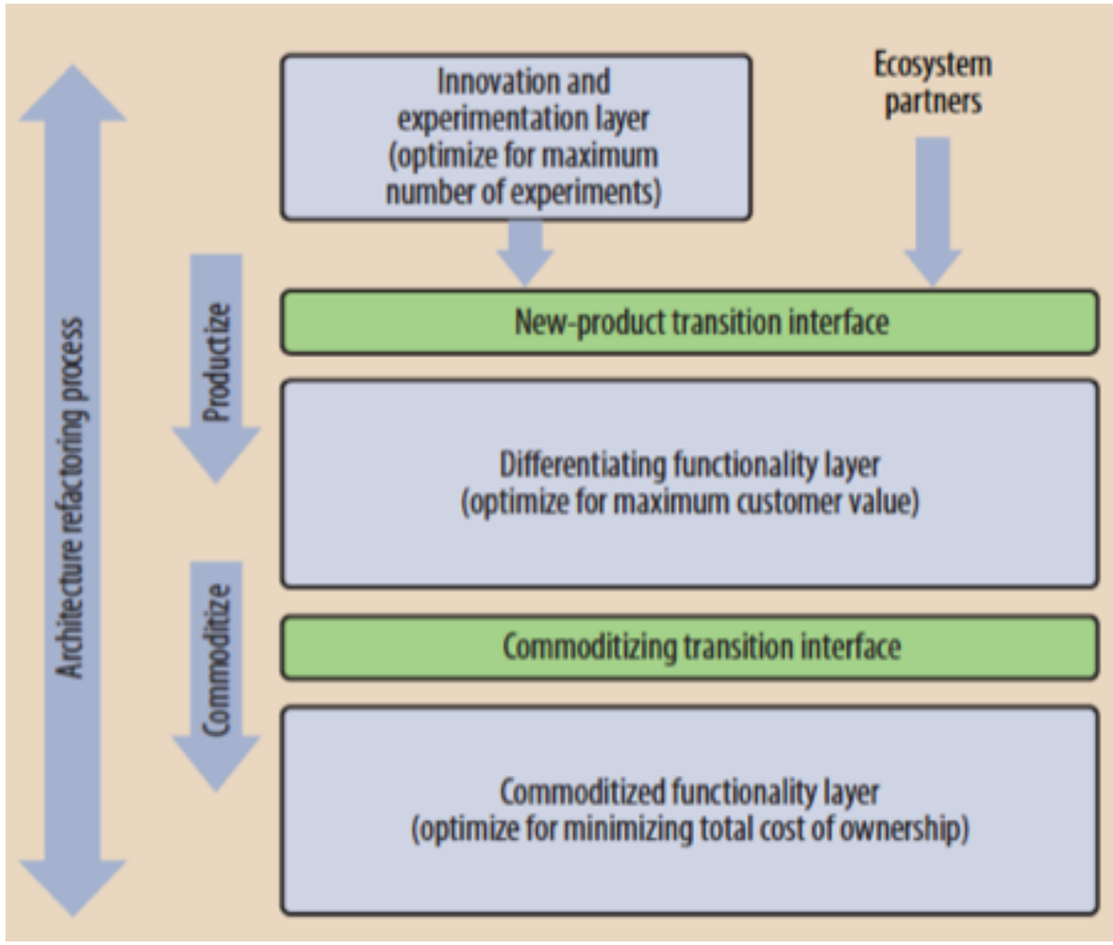
Preparing IT and Strategic views

Ref: The Open Group , ' Architecture Development Method '



TOGAF Architecture Development Method

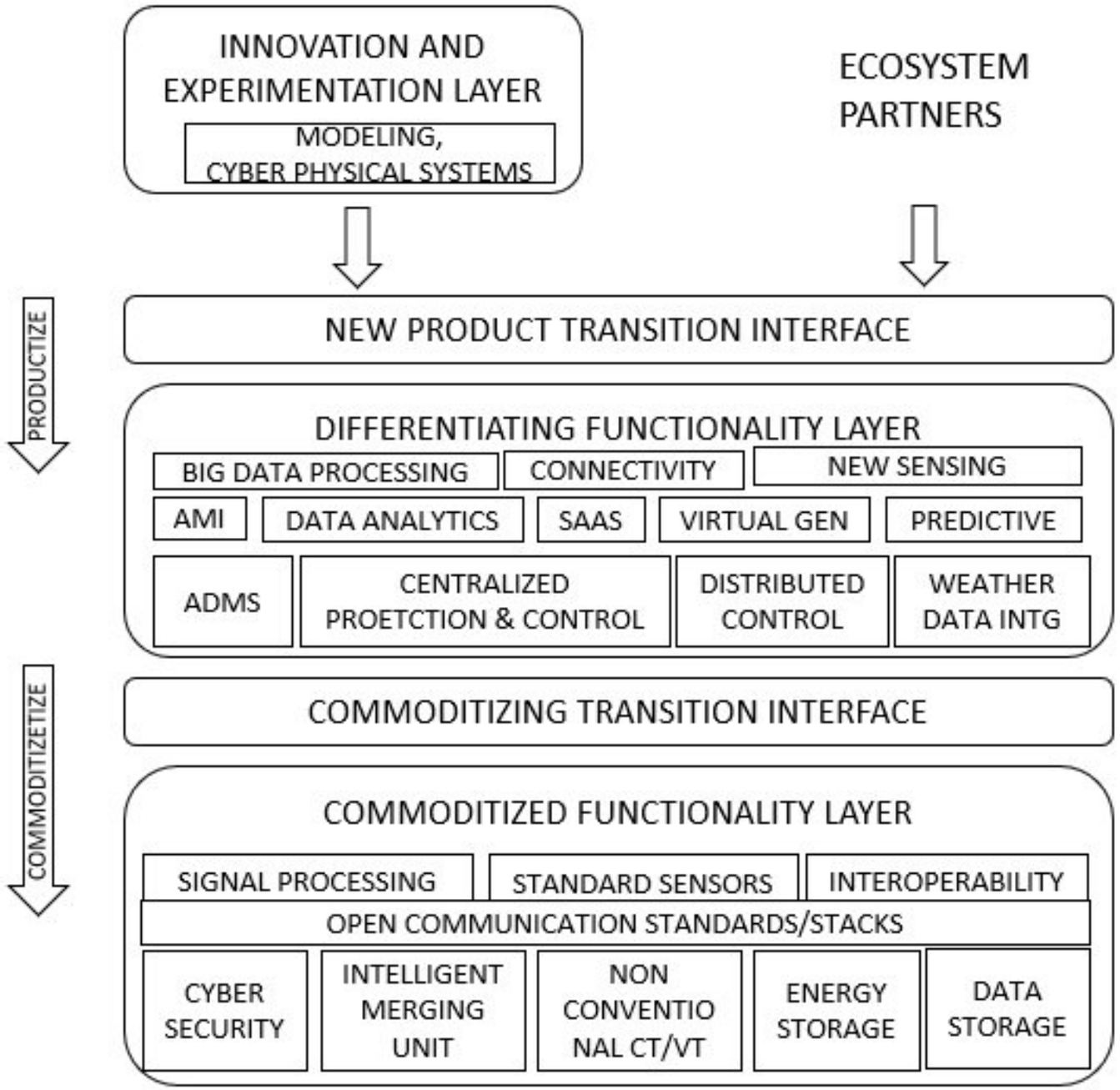
Ref: Jan Bosch '3 Layer Product Model'



Information Technology View

Strategic Technology View

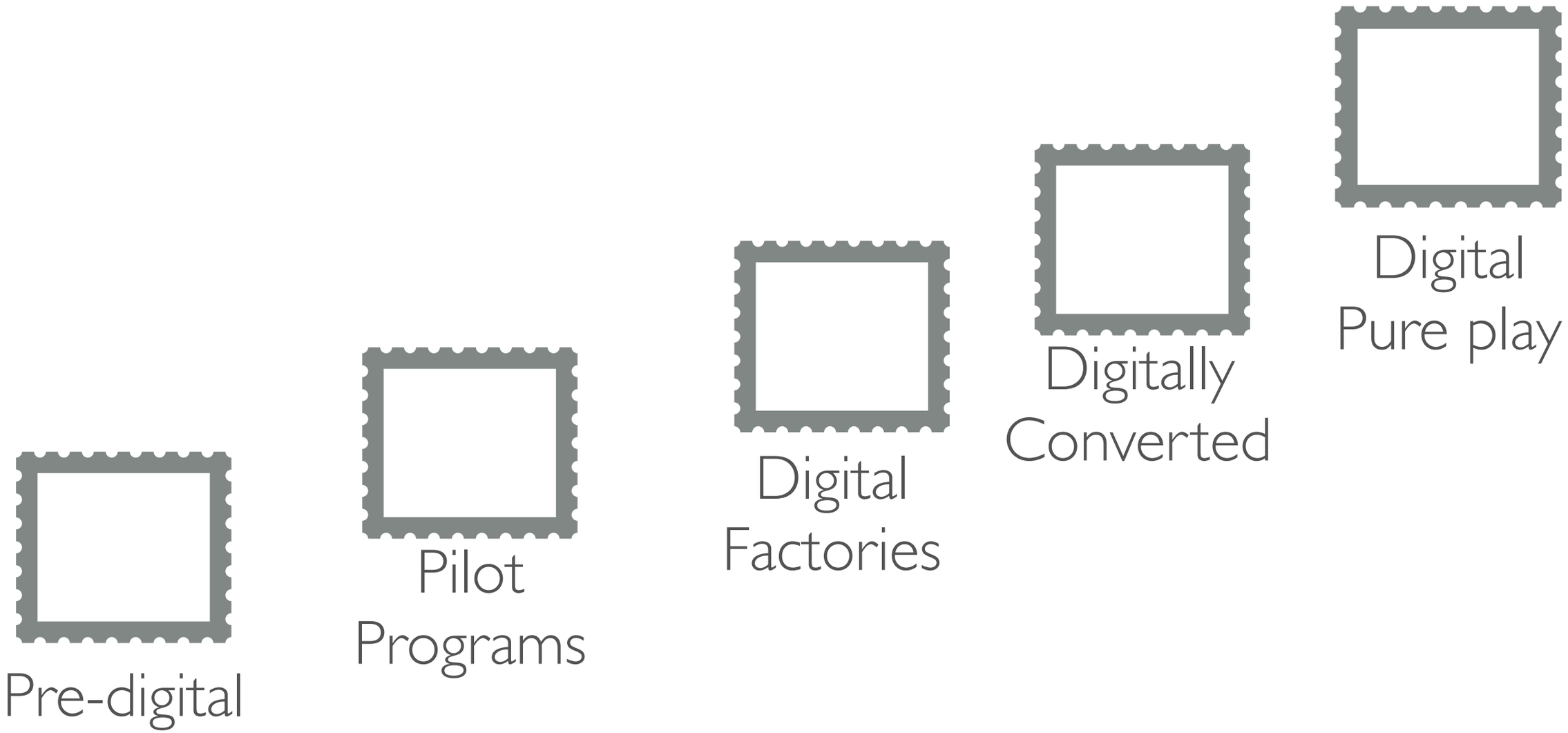
Using Architecture Development Method in its iterative fashion we can identify Information Technology and Strategic Product guidance or portfolio using a 3 Layer Product Model. An Initial or current state and final or expected state view will enable us to define clearly frame transitions. Technologies can be placed in boxes of commoditisation, differentiation and experimentation according from a strategic stand point.



An example in power systems automation using 3 Layer Product Model.

Planning Transformation

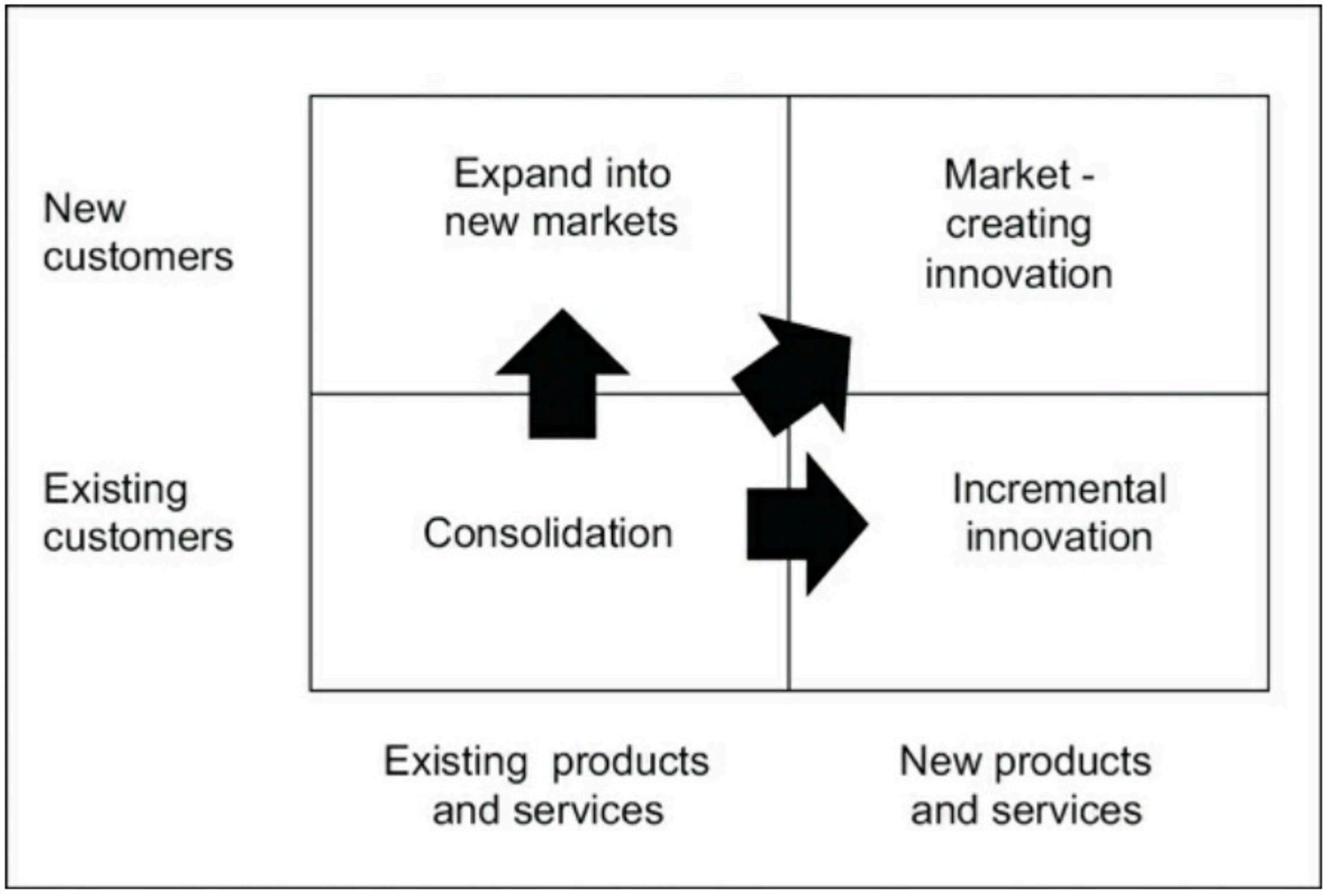
A pattern or frames of transformation



Pre-digital involves conventional IT. Pilot programs are initiated where teams work to prove value and feasibility. Digital factories involve teams working under repeatable and scalable digital models delivering products in 2 separate environments. Digitally Converted teams work with one view of delivery across digital and conventional operations while working with multiple speeds. Digital pure play is where teams are fully digital, a big leap for large scale organisations.

Planning Transformation

Figure 3-6. The four choices of customer focus.



Ref: Stephen Denning , ' Age of Agile'

From a portfolio stand point, the strategy needs to consider the four choices of focus and provide a balance between old and new initiatives.

ORGANISATIONAL AGILITY

Staying in stealth mode

Brains-Bones-Nerves

Agility requires changes across leadership and execution framework

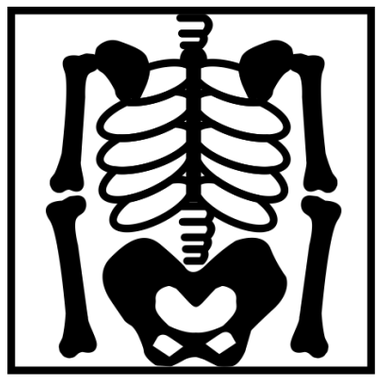
BRAINS

Created by popcornarts from Noun Project

SETTING DIRECTION

Compelling Vision
Differentiated Strategy
Unique Capabilities
Widespread understanding & acceptance of vision and strategy

EXECUTION



Created by Graphic Nehar from Noun Project

BONES

Quality of Talent
Supporting systems and processes
Roles and Responsibilities
Resource Allocation
Design and Structure

Created by IcoLabs from Noun Project

NERVES

Cultural Philosophy
Compensation and Rewards
Quality of Leadership
Short/Long term focus
Learning and renewal

Ref: Rajeev Peshawaria 'Too many bosses, Too few leaders'.

Leadership considerations

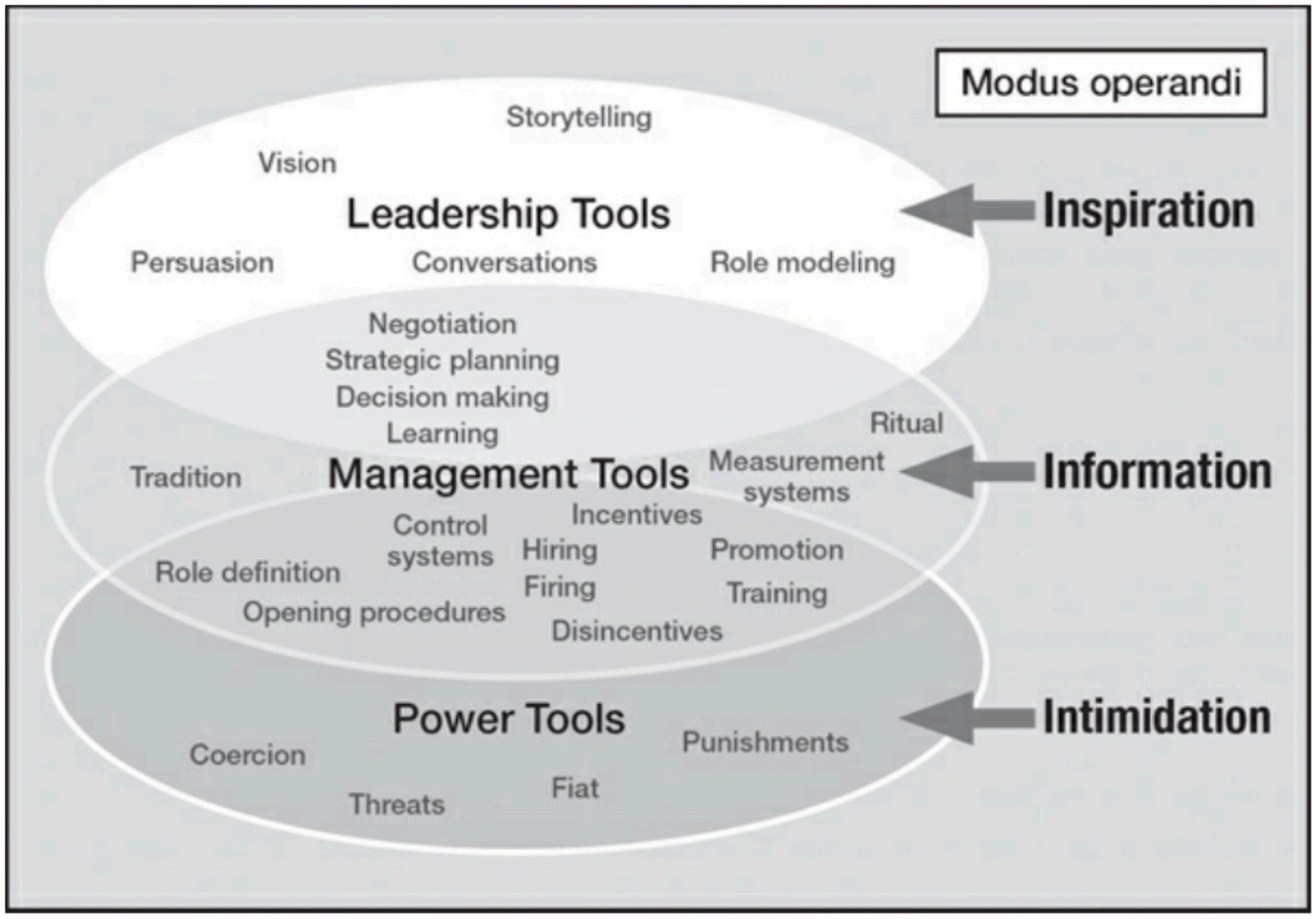
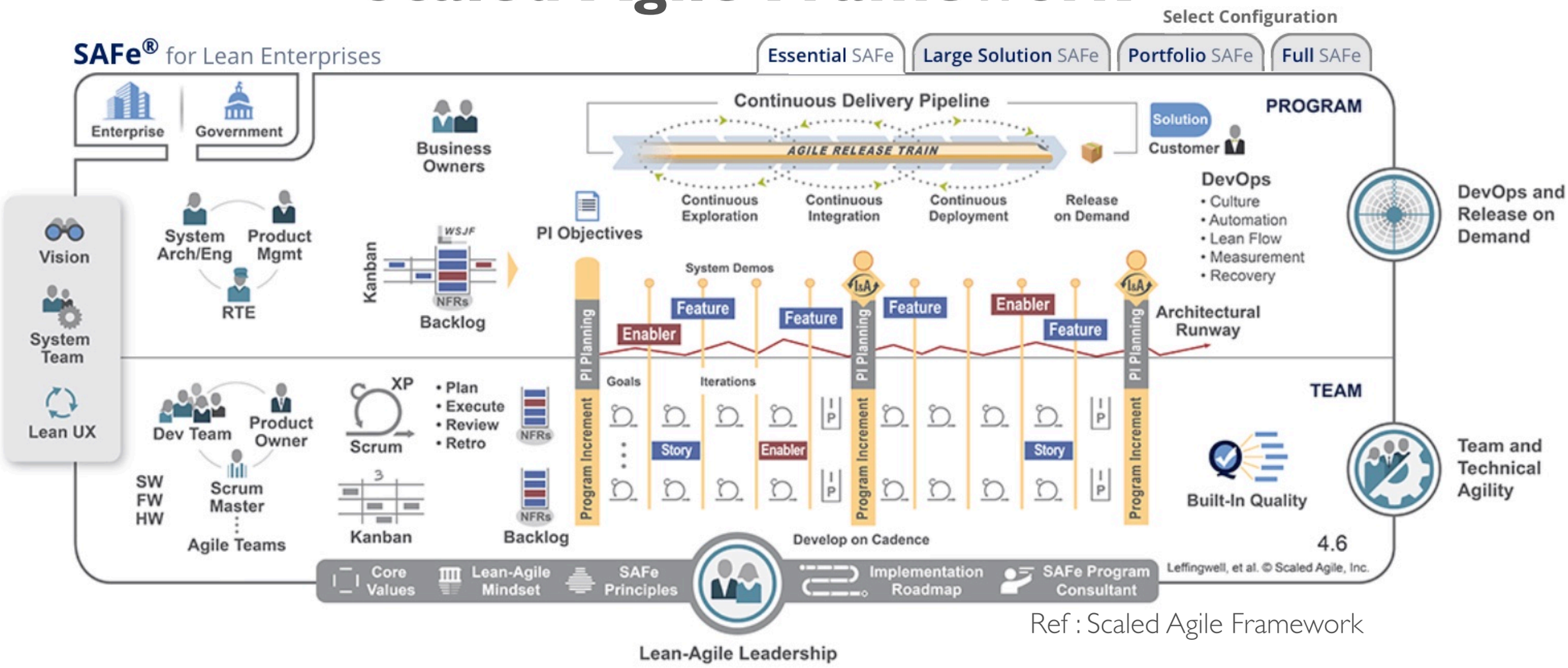


Figure 7-1. Organizational tools for changing minds.
Ref: Stephen Denning , 'Age of Agile'

'What we need is an entrepreneurial society where innovation and entrepreneurship are normal, steady and continuous '-
Peter Drucker

A digital savvy leadership leading by storytelling and inspiration is key to the transformation when it comes to culture and leadership. a culture of continuous learning is essential to the culture transformation. Another pre-requisite is the safety aspect that team members should feel psychologically safe - Can you take risks on this team without feeling insecure or embarrassed?

Scaled Agile Framework



Ref : Scaled Agile Framework

An organisational shift towards an agile based framework like SAFe becomes key to enterprises. The challenge enterprises face with Agile is the fact that enterprises traditionally are built on roles and responsibilities and their descriptions while Agile talks about moving towards self driven. This is a major shift. In SAFe there are some roles and responsibilities and this can be mapped to organisations. In the long run organisation itself should switch to this form of functioning.

APPROACH

Executing the transformation by focusing on speed, data and ecosystems.

Stairway to heaven: Speed

Traditional

1. Explicit phases in sequence
2. Requirements set and do not change.
3. Feed forward avoiding feedback from later phases back to earlier ones.

Concerns: Requirements never stable and long term predictions are difficult.

Agile

1. Agile manifesto led to adoption mainly driven by the increasing overheads in software development. (software engineer s spending 90% on activities other than code)
2. Shortens the development and requirements loops.
3. R&D and Product Management works together.

Concerns : Slow moving organisation vs team. Verification and validation organisation. (Late testing). Release to customer still away and happening once or twice a year.

Continuous Integration

1. Logical next step after agile development.
2. Enables Faster Feedback.
3. Provides insight into value of feature.
4. Reduces time feature is developed to corrected.
5. Shorten development loop, R&D management and company and there is always a shippable product. Release process more predictable.

Concerns: Diversity of varied customer environments. As configurability increases, the ways product is deployed grows more diverse.

Continuous Deployment

1. Continuous deployment is when producer of software decides when it is deployed on real live contexts.
2. Frequently deploying identify clear errors and also tracking quality attributes of the product. Helps development understand the impact of features and quality attributes.
3. The quality monitoring loop is shortened. Quality attribute feedback loop also shorter. Provides additional support for speeding up customer feedback to Product management.
4. Changes relationship with customer.

Concerns: Still there is limited feedback to Product management regarding features and how they satisfy customer needs. (Are we building the right product)

R&D as an Innovation Ecosystem

1. Product management and R&D gets closer to each other. Software is instrumented to gain insights from customers through aggregation, by team interpreting and analysis of results. Building the product right is the focus.
2. Adoption of services business model, gap between customers and users shrink. This is a data driven decision making approach.
3. Feedback loop closes the gaps in benefits of functionality in terms of days or weeks. Enables optimisation of features.
4. Architecture of product needs to evolve to collect relevant data. Some industry challenges to get access to data.

Concerns: Teams start seeing they are optimising multiple parameters. R&D tasks that won't see quick feedback will be prioritised lower. Radical innovations where benefits take time to realise maybe difficult to drive.

Verification and validation against few defined scenarios.
Verified against few selected environments and variations..

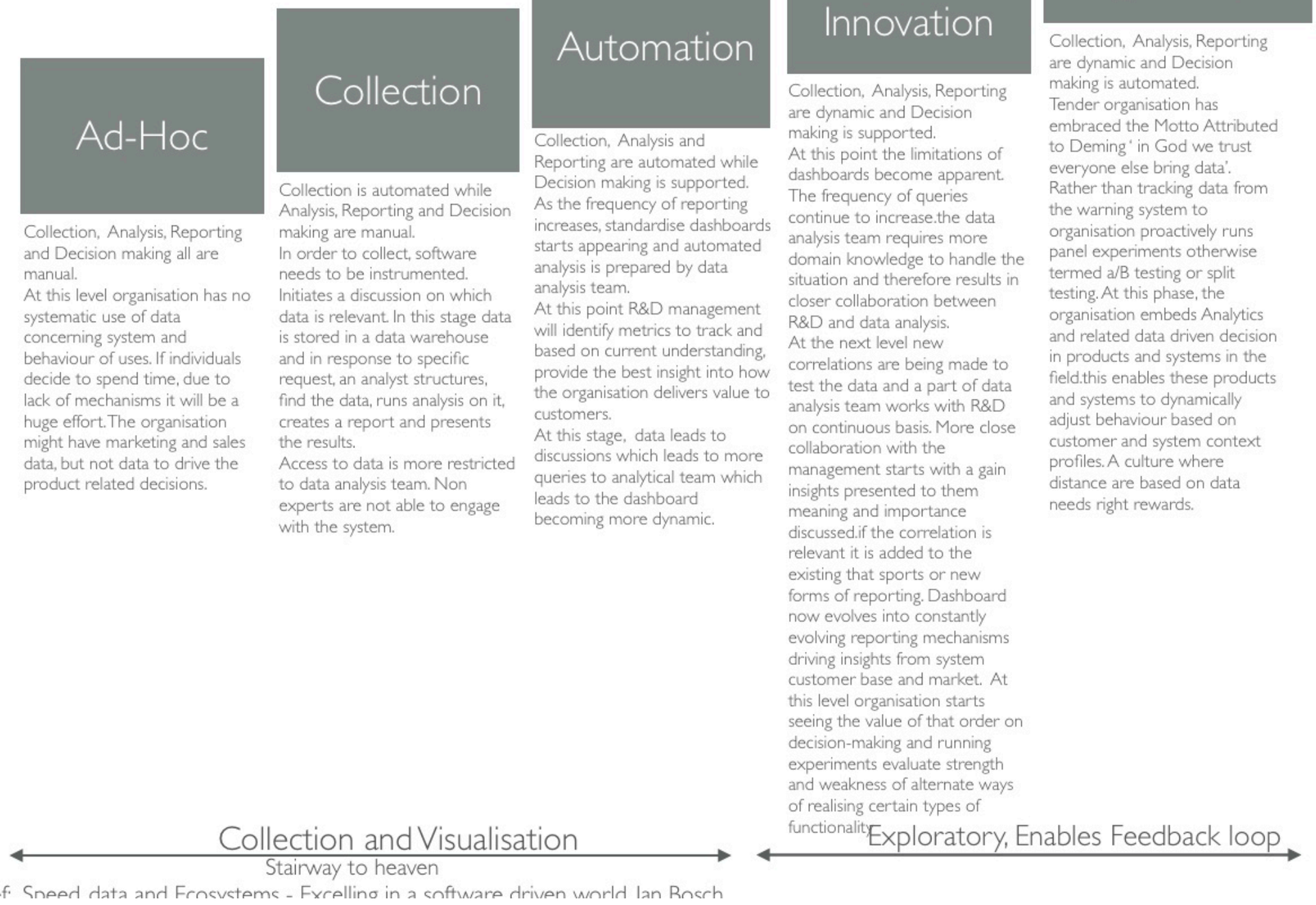
Verification and validation against real environments and customer scenarios.

Stairway to heaven

ef: Speed, data and Ecosystems - Excelling in a software driven world, Jan Bosch.

The first dimension of stairway to heaven model is concerned with speed . Speed is focused on shortening feedback loops. In general feedback loops lead to faster adjustment to changes in target environment. The speed dimension distinguishes five levels starting with traditional, agile, continues integration, continuous deployment, and R&D as an experimentation system.

Stairway to heaven: Data

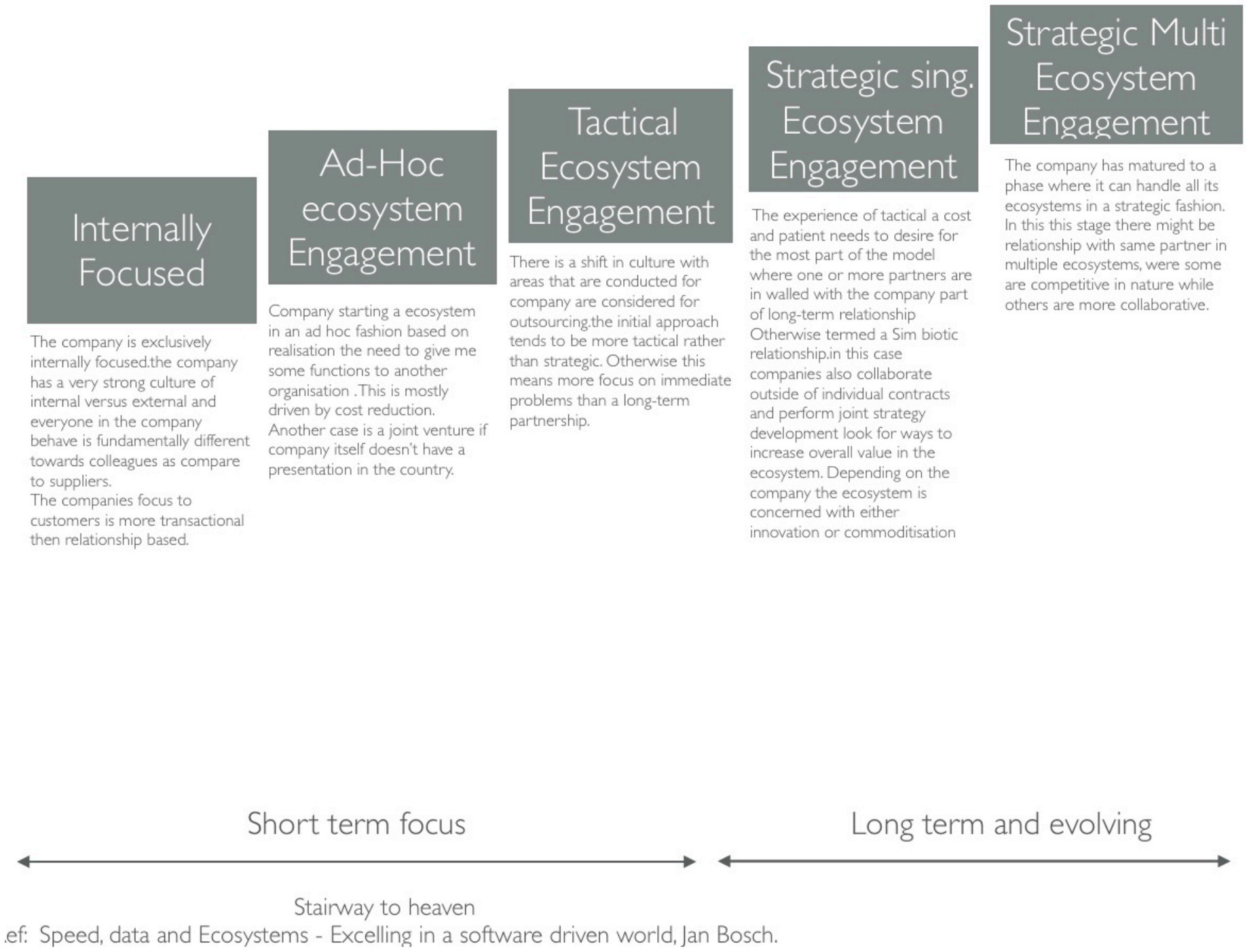


f: Speed, data and Ecosystems - Excelling in a software driven world Jan Bosch

Stairway to heaven : Data

With Moore's law continuing to deliver great progress, computing power can now churn out vast amounts of data in response to queries. Amazing insights can be generated out of correlating multiple variables and shifting through large amounts of data. The cost of collecting storing and analysing large amount of data is much less now. Due to increased availability of data companies are now shifting towards decision making based on data. One of the most promising areas for data driven decisions is in area of customers use and appreciation of the product or system. Another is the use of performance data by products in field and the impact of features and refactoring the system.

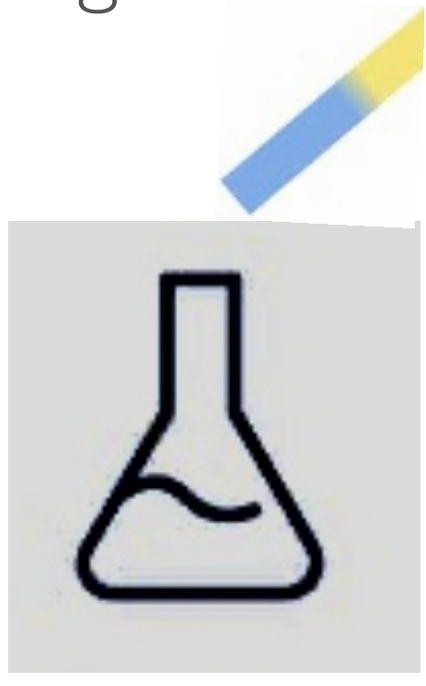
Stairway to heaven: Ecosystems



ef: Speed, data and Ecosystems - Excelling in a software driven world, Jan Bosch.

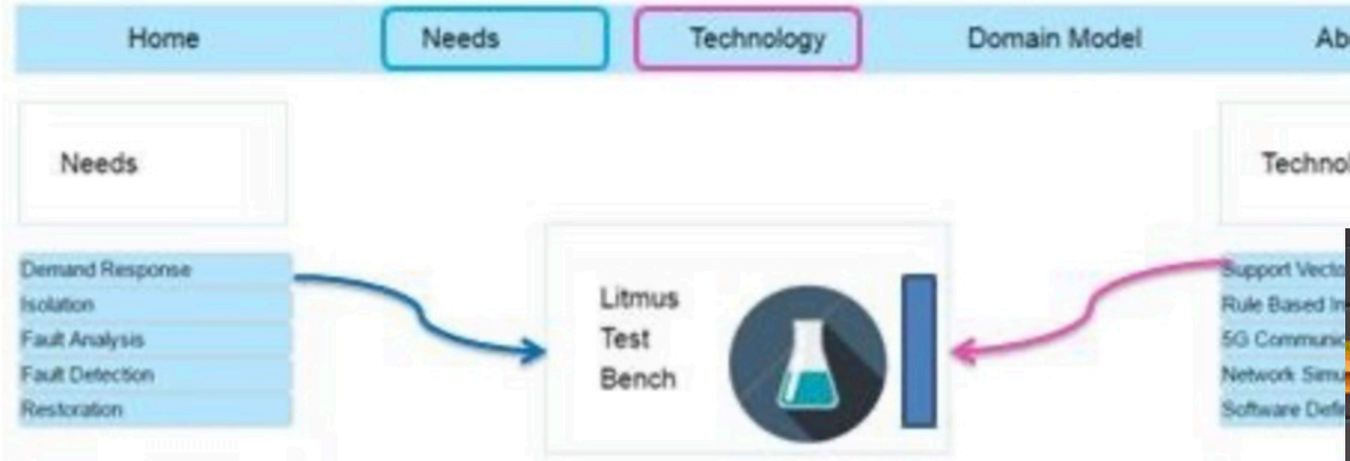
Partnerships have become essential in business today. No company can alone be technology leader due to the combined effects of these technologies. Focusing on organisations' core and identifying those other areas which can be supported by outsource partners or crowd sourcing including open source is important to be focused and progressing in right direction.

Three key accelerators for digital are the blender concept, hackathons, Digital thread and Digital twin



VALUE LITMUS TEST

Blending Technology and Business



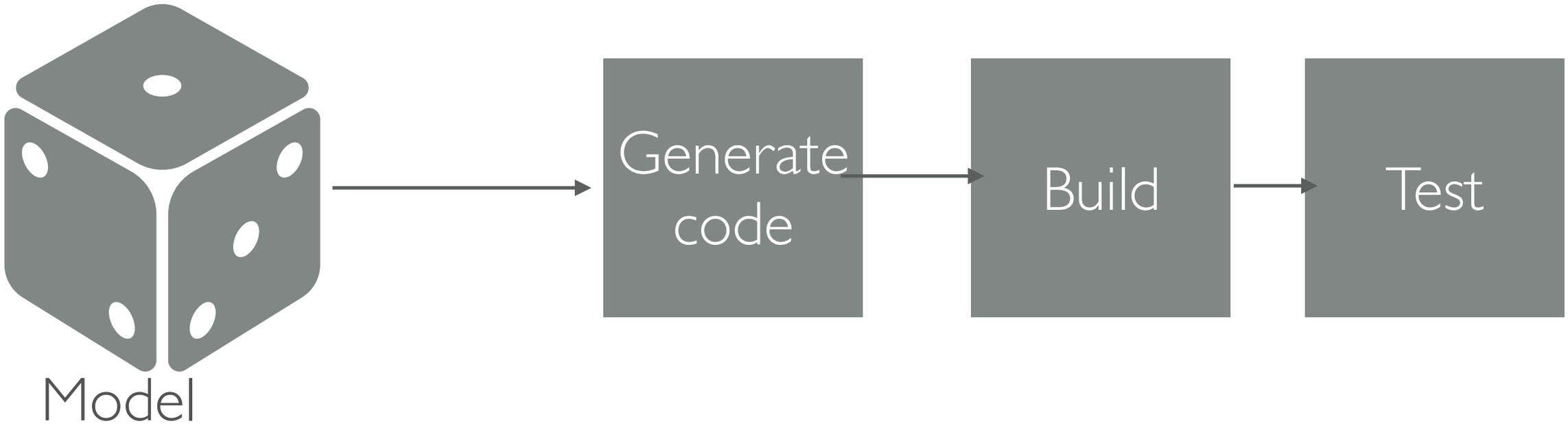
Blending Technology and Business

Most enterprises possess their own business analytical. They collect information about market, sales and also about competition. These information can be used to build a data based toolkit, called the blender. A consistent clear direction on innovation would enable a faster innovation and business intelligence is used to create value.
A better directed hackathons which enable realisation of ideas supporting a design thinking approach would be greatly beneficial.

DIGITAL THREAD & DIGITAL TWIN

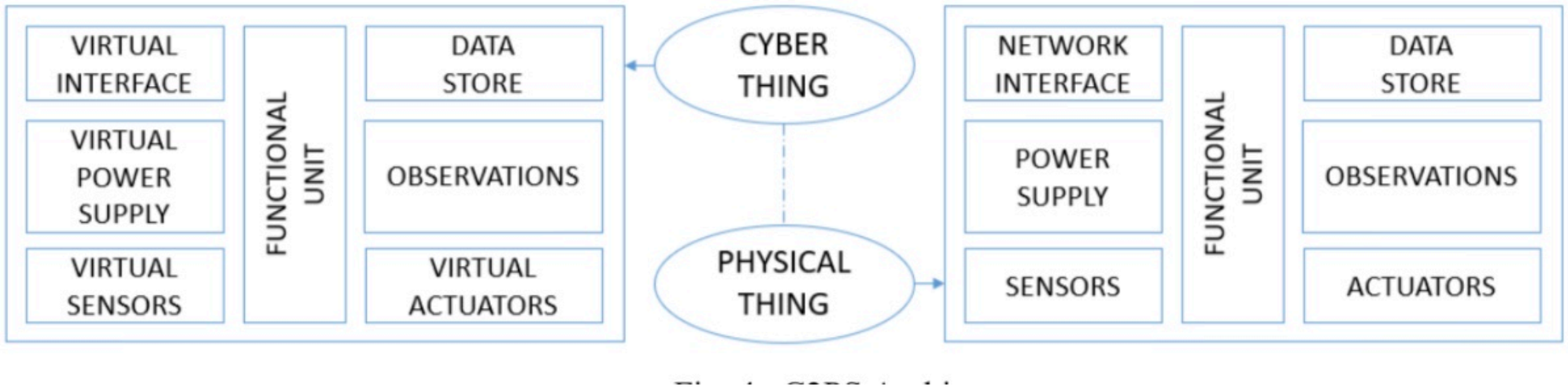
Model based engineering and Cyber Physical Systems

Digital thread



Digital thread represents a model based engineering approach where a model is built and using this as specification, next steps are done. This approach allows precision across various engineering activities.

Digital twin



Digital twin is the virtual representation of a physical asset. Enterprises used to be having models and used them for simulation. Now these models are hosted as virtual and connected with physical asset like motor . By being connected, the virtual model can improve and can be used to improve the efficiency of physical assets by monitoring them and the learning based on usage. A digital twin created based on model built can be heavily useful in experimentation with these systems.

REFERENCES

1. World Economic Forum, Digital Transformation Initiative, May 2018
2. Leading Digital - Turning technology into business transformation.
3. The Digital Transformation Playbook – Rethink Your Business for the Digital Age.
4. https://www.forbes.com/sites/jasonbloomberg/2018/04/29/digitization-digitalization-and-digital-transformation-confuse-them-at-your-peril/#c9a77bd2f2c7
5. Mc Kinsey, Towards an integrated operating model.
6. Digital to the Core: Remastering Leadership for Your Industry, Your Enterprise, and Yourself.
7. Stephen Denning, 'Age of Agile'.
8. Jan Bosch, 'Speed Data and Ecosystems- Excelling in a software driven world', CRC press.
9. Innovation Blender - A tool for technology business litmus test
10. Cyber physical systems -A tool for continuous evolution of systems