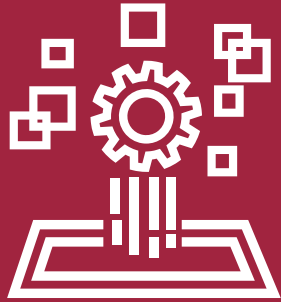
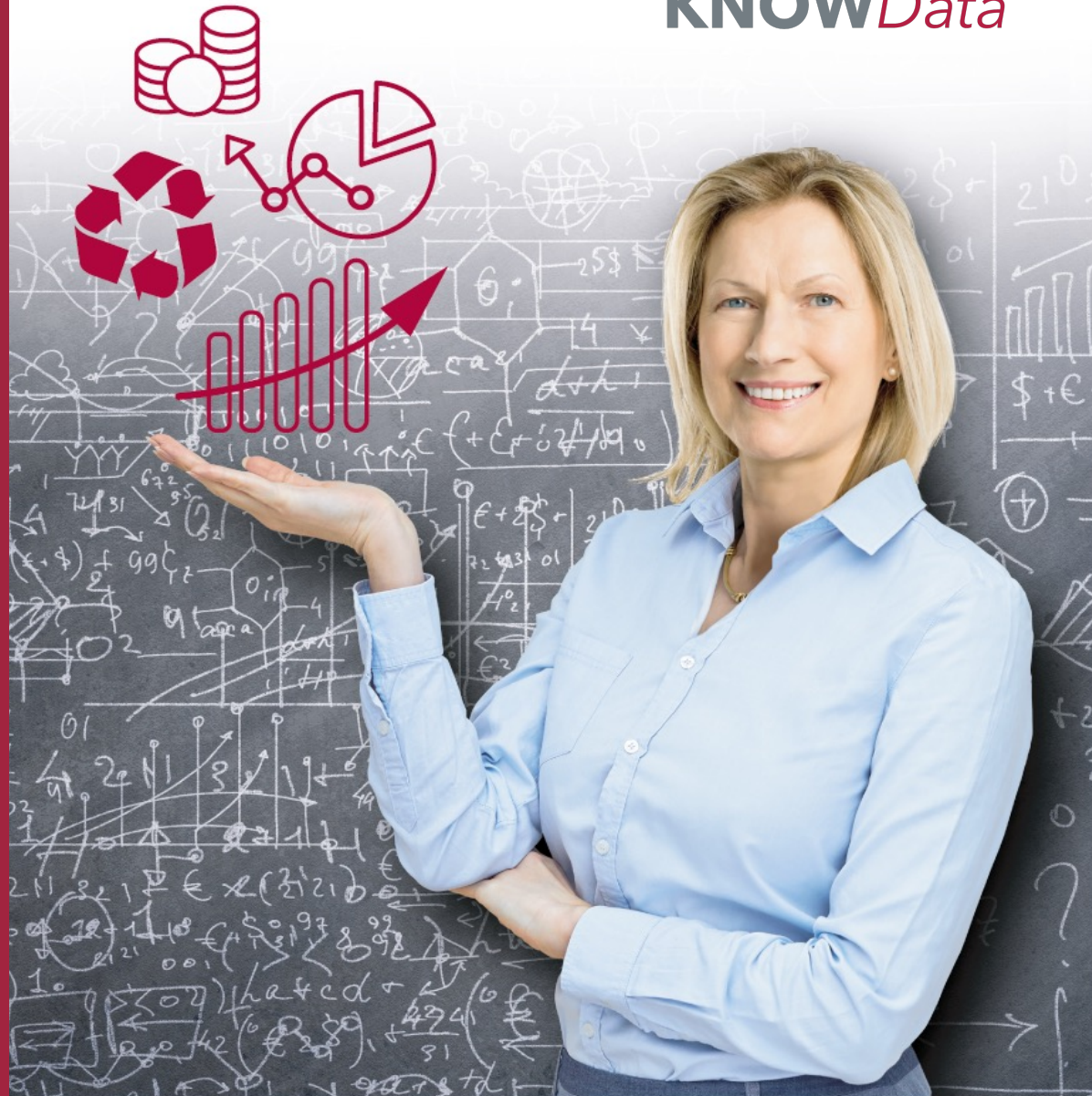


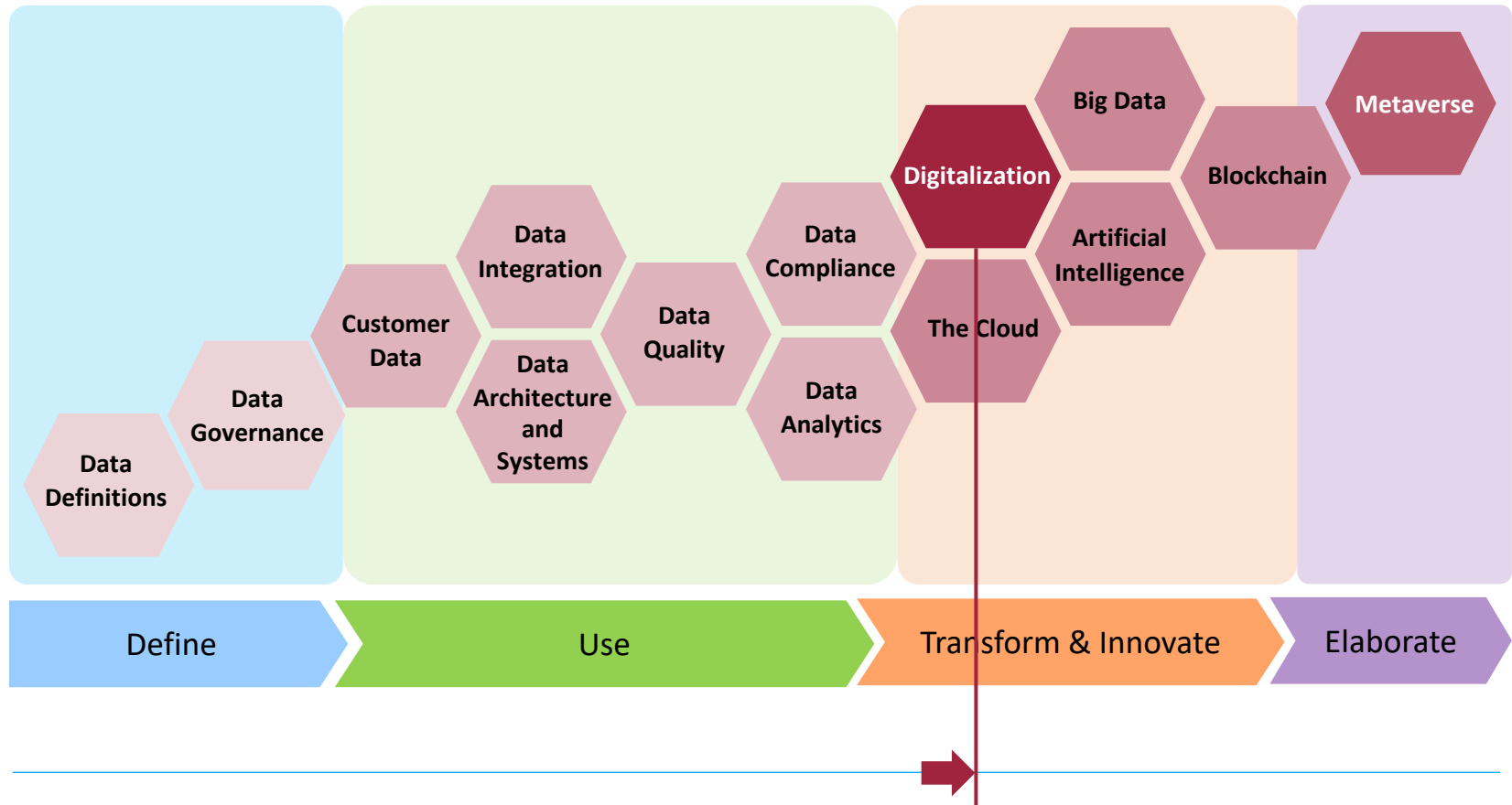
Digitalization



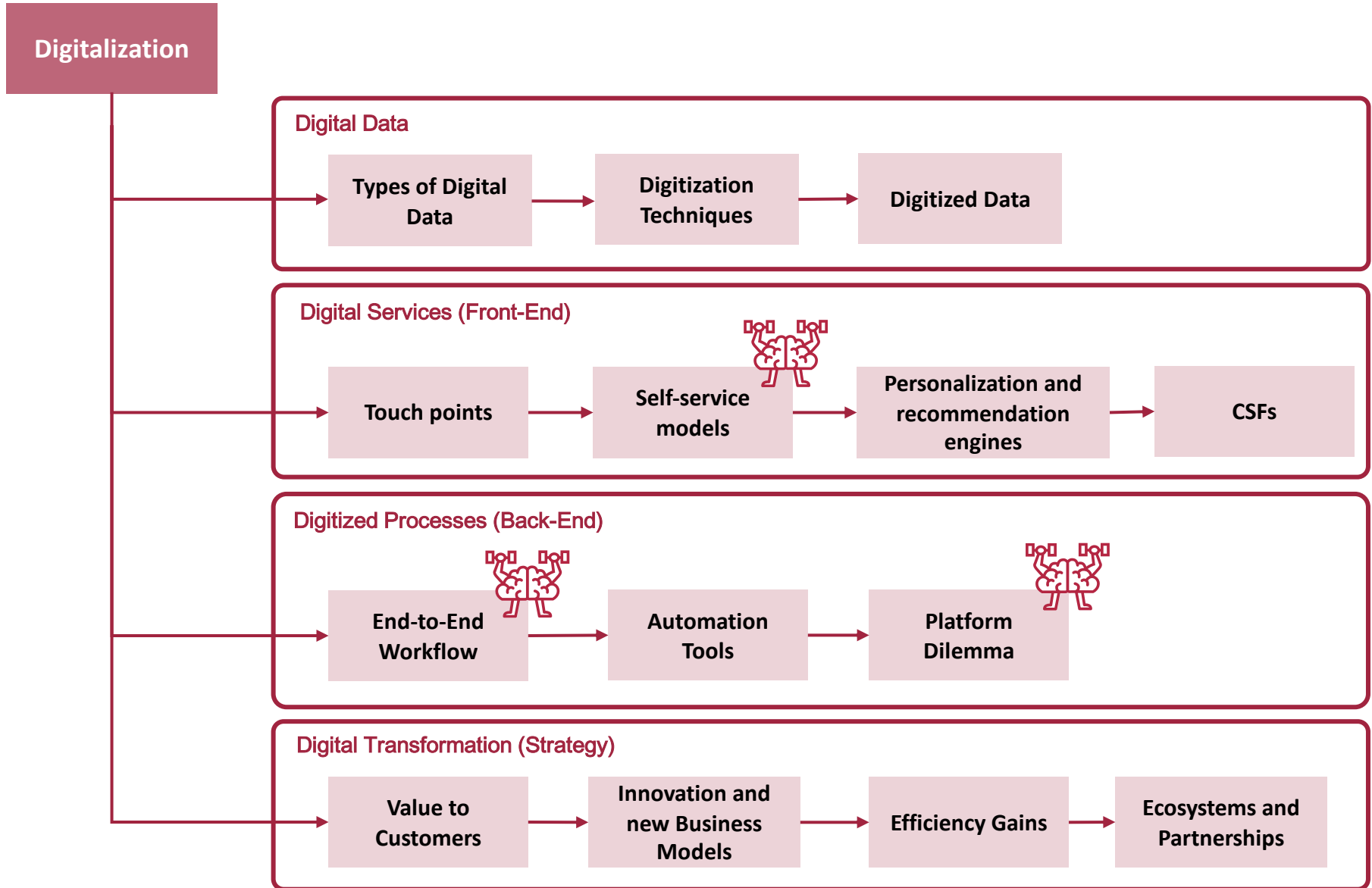
KNOW*Data*



September 12, 2026
Lionel Pilorget



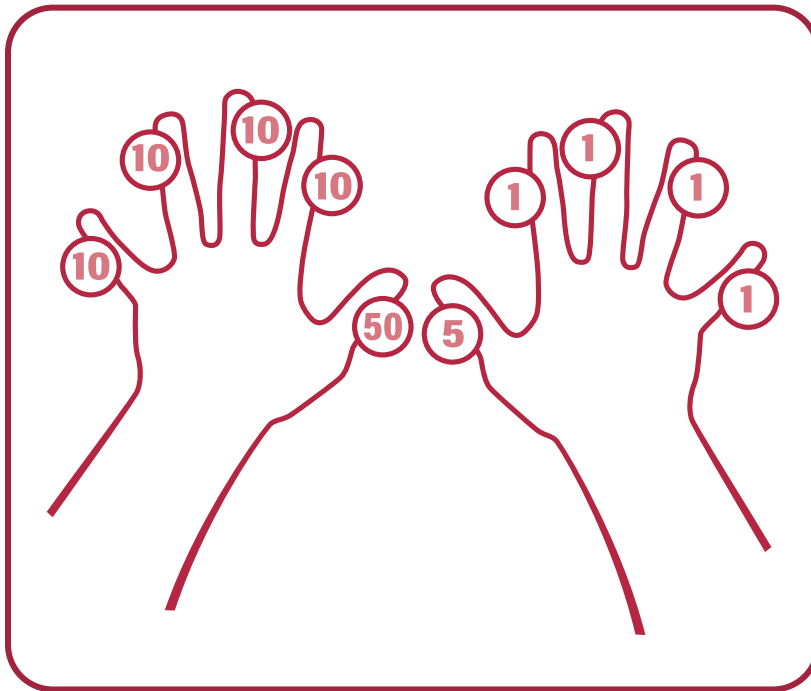
Structure of the presentation



From Digitus to Digit



Digitus (Latin) = finger or toe / Digit = numeral from 0 to 9



2-digit numbers

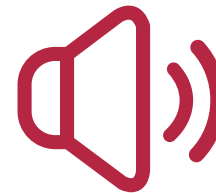
10	20	30	40	50	60	70	80	90
11	21	31	41	51	61	71	81	91
12	22	32	42	52	62	72	82	92
13	23	33	43	53	63	73	83	93
14	24	34	44	54	64	74	84	94
15	25	35	45	55	65	75	85	95
16	26	36	46	56	66	76	86	96
17	27	37	47	57	67	77	87	97
18	28	38	48	58	68	78	88	98
19	29	39	49	59	69	79	89	99





Four types of digital data

Type	Examples
Text (characters)	Email, documents, programs...
Image	Graphs, illustrations, photos...
Video	Movies, videos, television...
Audio	Telephone, sound, records...



Converting analog information in digital formats

1 Bit
(binary digit)

0 or 1

1 Byte (B) = 8 Bits

1	0	1	0	0	1	1	0
---	---	---	---	---	---	---	---

Unit	Symbol	Size
Kilobyte	KB	1'024 B
Megabyte	MB	1'024 KB
Gigabyte	GB	1'024 MB
Terabyte	TB	1'024 GB
Petabyte	PB	1'024 TB

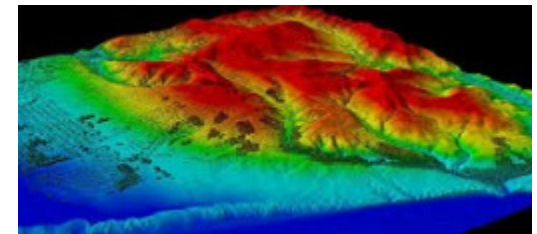
Unit	Symbol	Size
Exabyte	EB	1'024 PB
Zettabyte	ZB	1'024 EB
Yottabyte	YB	1'024 ZB
Ronnabyte	RB	1'024 YB
Quettabyte	QB	1'024 RB



Coordinate Measuring Machines



3D scanning



Remote Sensing



The result of digitization = data in a digital format

Human-generated digital data

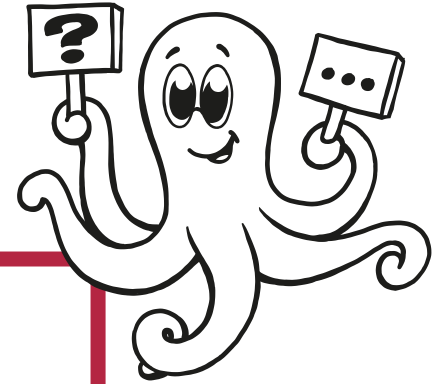
- **Text** typed in emails, messages, social media posts
- **Photos/videos** taken by people
- **Documents** (Word files, spreadsheets) created manually
- **Online transactions** a person performs
- **Form inputs** (sign-ups, surveys, feedback)

~40% of the world's data

Machine-generated digital data

- **Sensor readings** (temperature, GPS, accelerometers)
- **Server logs** (website visits, error logs)
- **Network traffic data**
- **Smart device outputs** (smart meters, IoT devices, cars)
- **Automated system data** (security cameras, industrial equipment)

~ 60% (or more) of the world's data



$$\Delta x \cdot \Delta p \geq \frac{h}{4\pi}$$



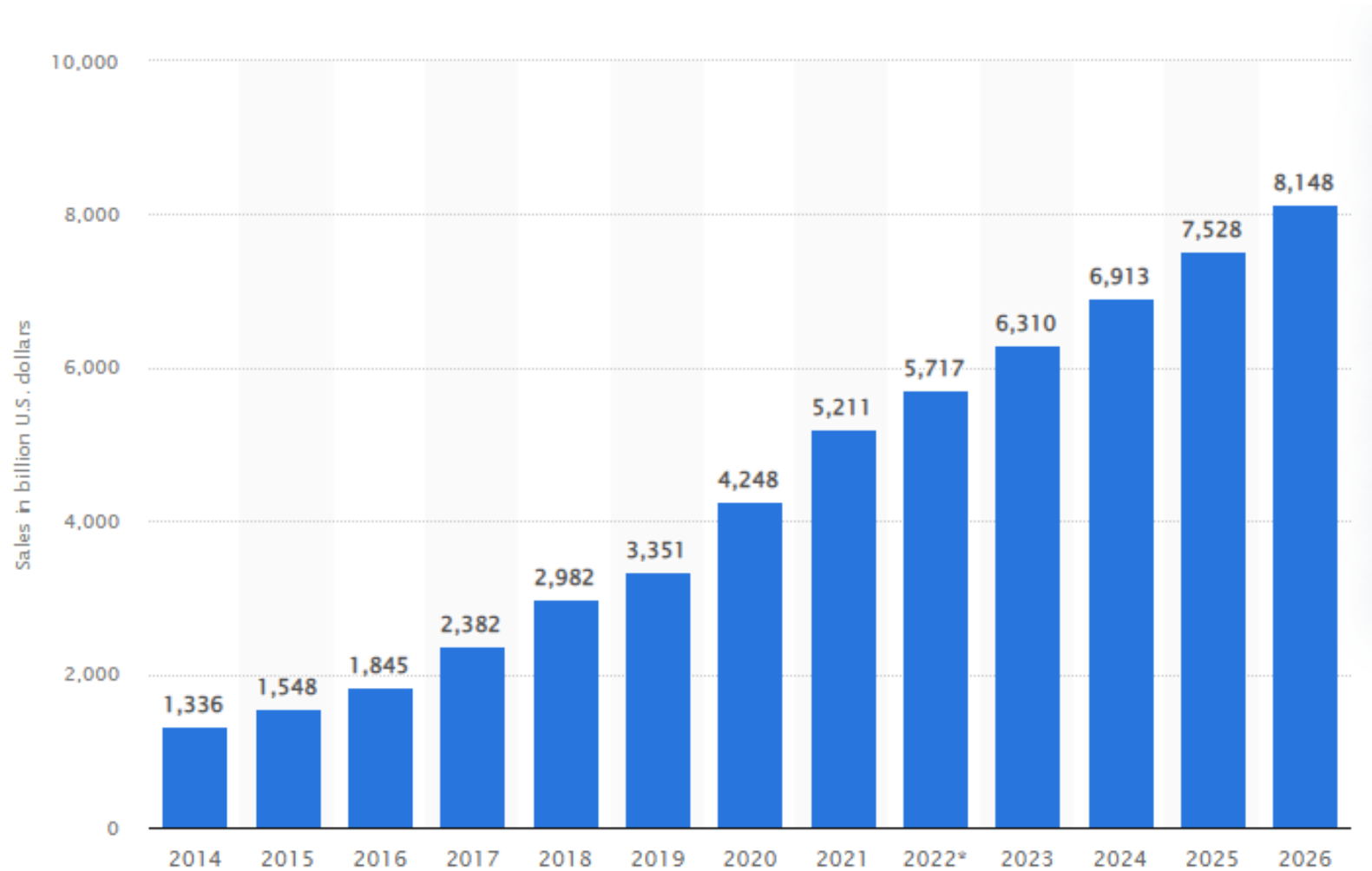
Term	Definition	Focus	Scope	Outcome	Key tools	Example: Library
Digitization	Converting analogue information into a digital format	Data & Information	Tactical (a specific task or function)	Accessibility & Storage (e.g., easier to store, search, and share)	Scanners, OCR Software, PDFs, CAD files, Digital Cameras	Scanning physical books to create PDF
Digitalization	Using digital technologies to improve existing business processes	Process & Efficiency	Operational (a department or cross-functional process)	Efficiency & Productivity (e.g., faster, cheaper, more accurate processes)	CRM Systems, ERP Systems, Workflow Automation, Cloud Collaboration (Slack, MS Teams)	Creating an online catalog system so users can find and reserve books from home, streamlining the lending process
Digital Transformation	strategic, organization-wide change that leverages technology to create new value and business models	Business Model & Customer Value	Strategic (the entire organization and its ecosystem)	Competitive Advantage & New Revenue (e.g., a new way of doing business, new markets)	AI/ML, IoT, Big Data Analytics, Cloud Platforms, Digital Products/Services, Ecosystem Partnerships	The library redefines itself as a "community knowledge hub," offering online courses, streaming cultural events, lending digital tools, and using data to curate personalized learning paths



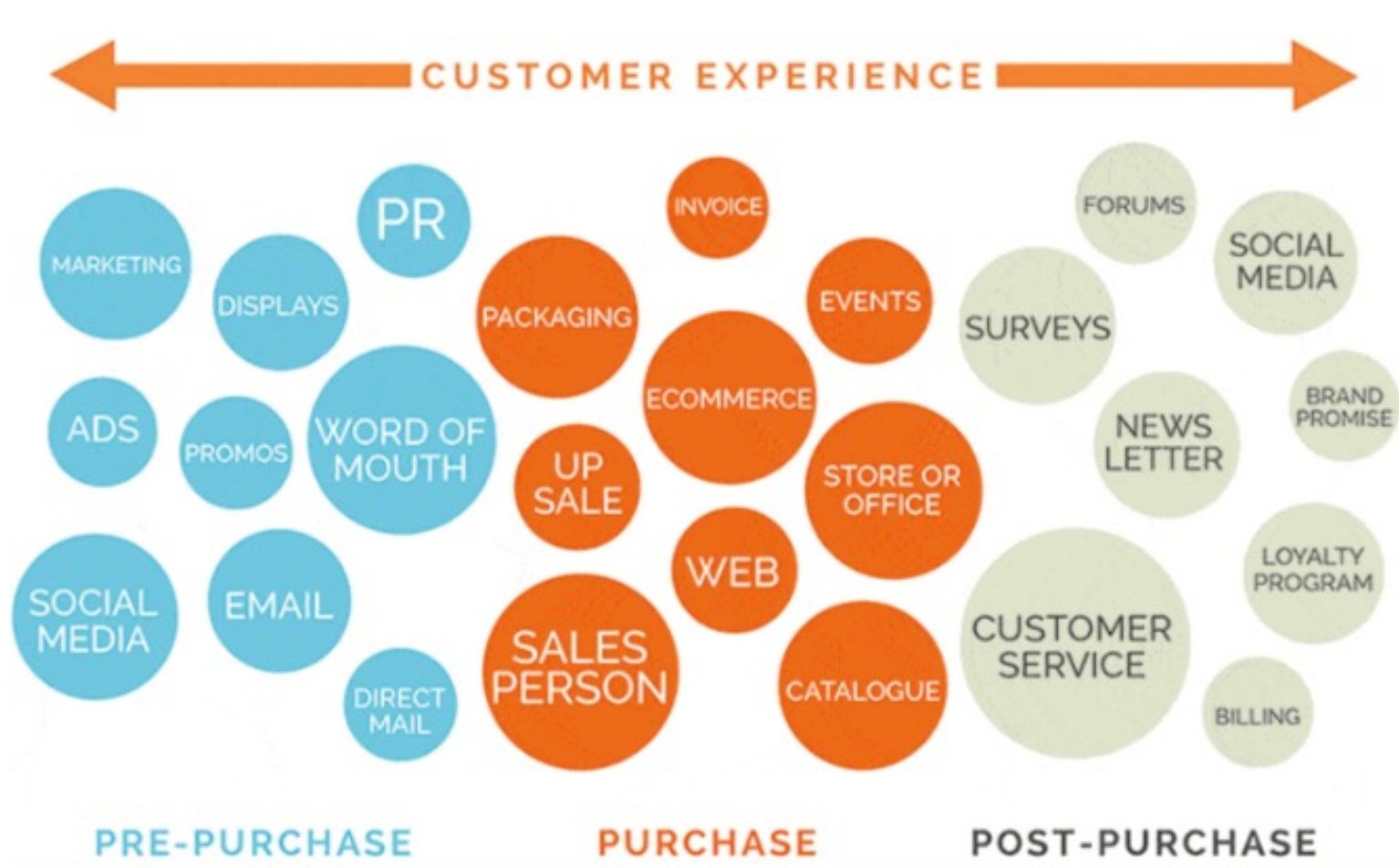
Any service delivered over the internet or through electronic networks rather than in a physical form. It relies on digital technology to create, process, store, or transmit information.

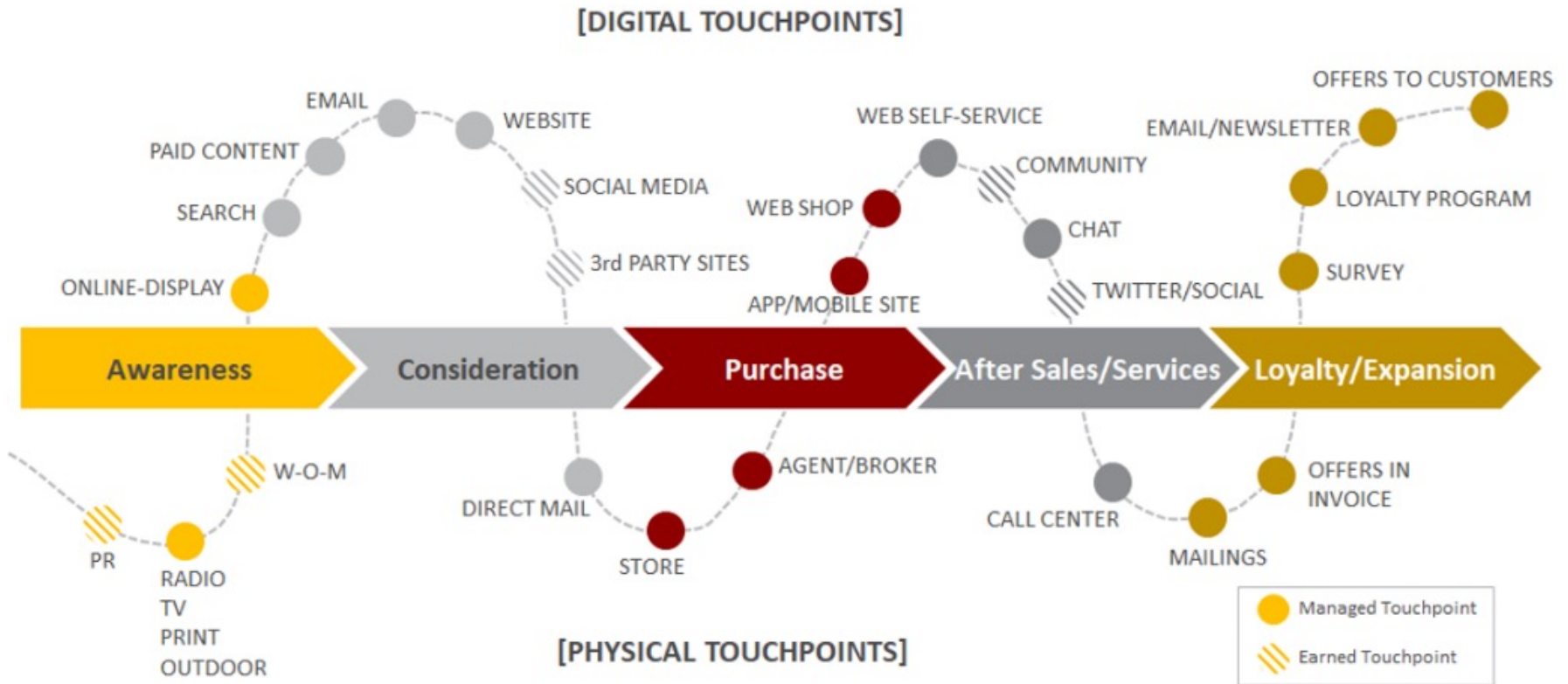


Retail E-commerce Sales Worldwide



Customer Touch Points







[DIGITAL TOUCHPOINTS]



Digital “Micro-Services”

- online onboarding
- content marketing
- gamification
- electronic signature
- notifications
- Social media
- digital signature
- payments
- rewards
- bots

Example 1: Digital Onboarding



Step 1

Document verification system to read identity documents such as ID-cards and passports from different nationalities and perform advanced checks in milliseconds.



Step 2



Ensure the documents are presented by their **rightful owner**. The user is asked to move their head in front of the camera while the system takes multiple photos. This advanced verification method assesses the facial biometrics of the person, while checking for liveness, ensuring a real person is submitting the verification request.

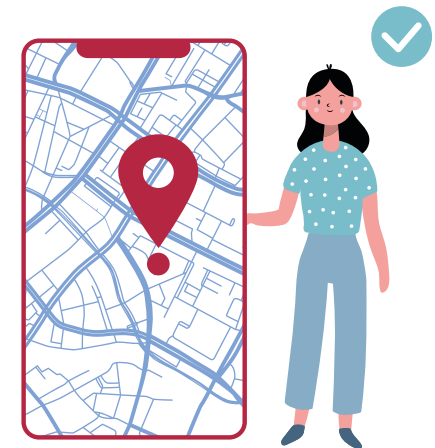
Step 3

All data is **matched together** to obtain a full picture of the person requesting the identification. Live photos are compared with the photos on the ID to ensure there is a match.



Step 4

As a last step, the user is asked for their address information, and this is **cross-checked** with official databases to ensure authenticity.



Example 2: Electronic Signature



e-signatures

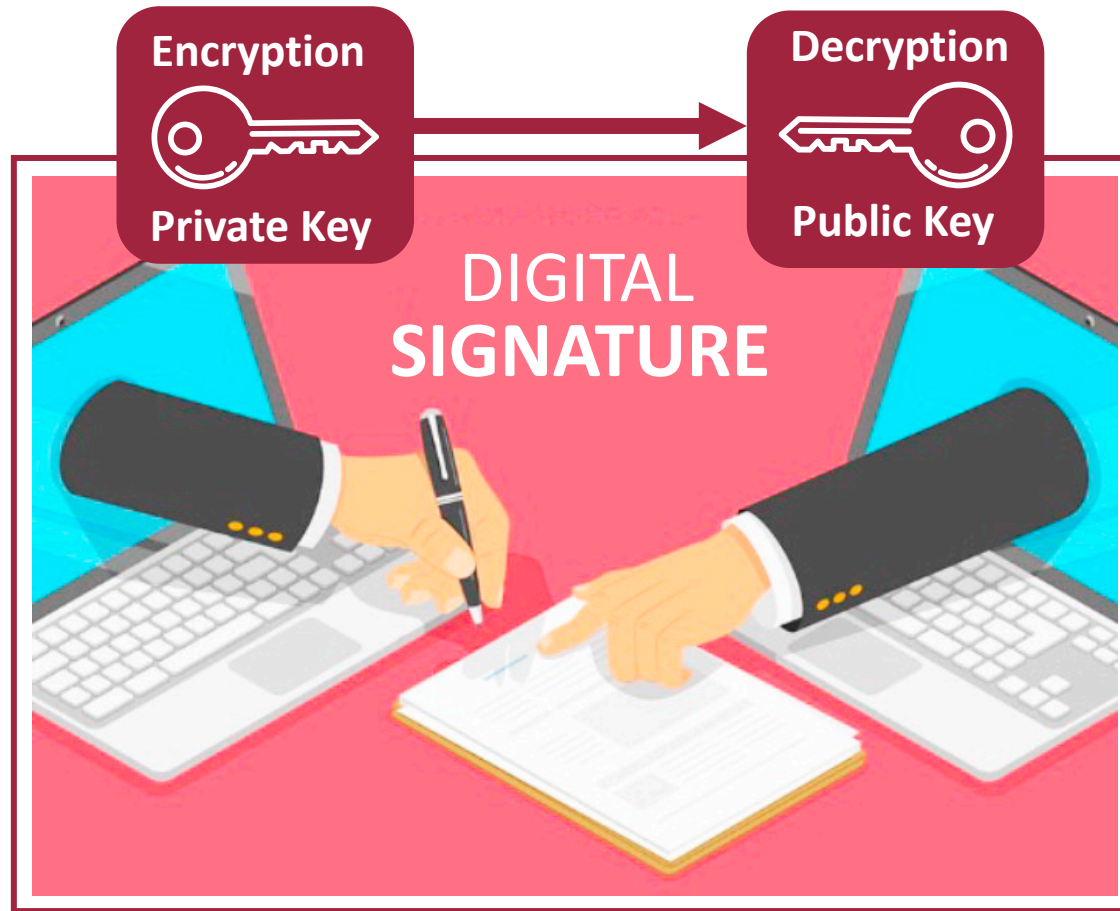


Providers: Adobe Acrobat Sign, DocuSign, Eversign, HelloSign, PandaDoc, signNow

Example 3: Digital Signature



Specific type of electronic signature that uses cryptography

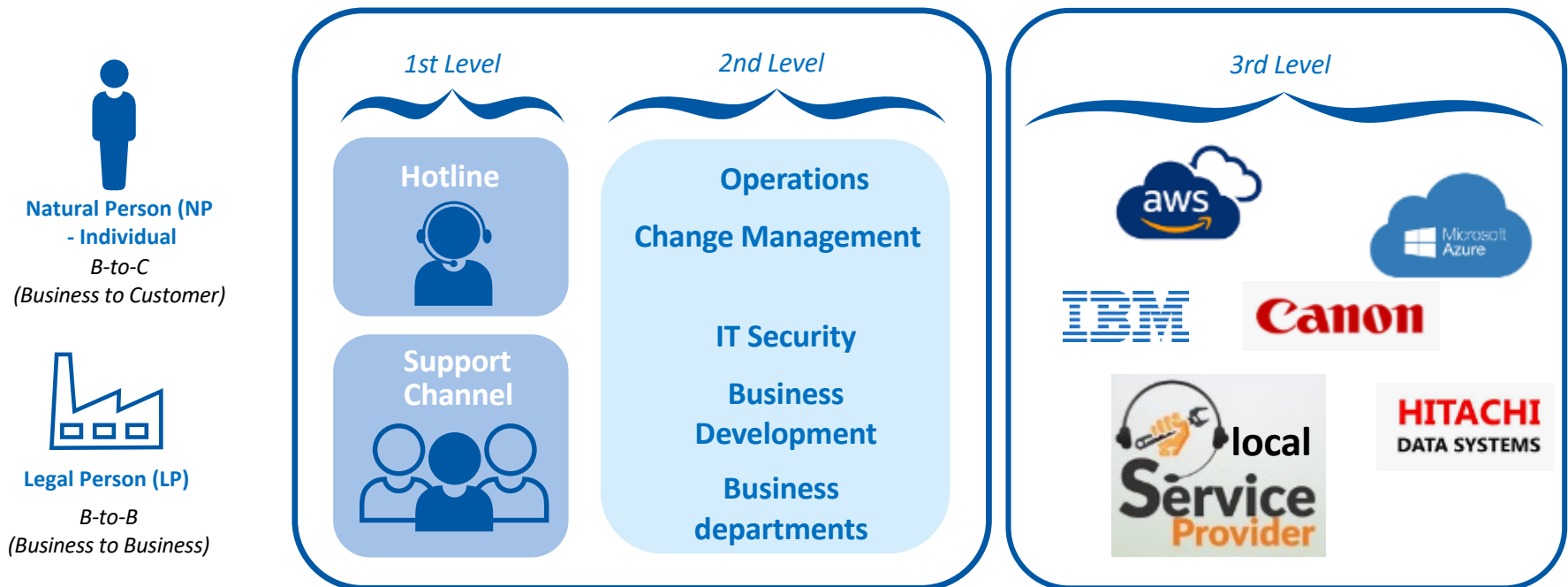


Definition of Digital Service



A digital service is the sum of processes and procedures that need to be lived by the different stakeholders so that the user can conduct operations on a self-service basis.

A digital service ensures that **customers** are **highly satisfied** with the solution which represents a **complex system** where **many different partners** are involved.



Ensure customer loyalty and trust

Functionalities are **easy** and **intuitive** to use. The user can do a lot **on his/her own** thanks to self-administration. Customers are **regularly informed** about new features.



Usability

Calls and emails are answered **competently** and **expeditiously** by the hotline or the Relationship Managers. Complaints are taken up by the hotline and analyzed and addressed thanks to **the "complaint management" process**.



Client support



Evolutions

New significant functionalities and enhancements are identified and developed, tested and implemented in a **high quality**.



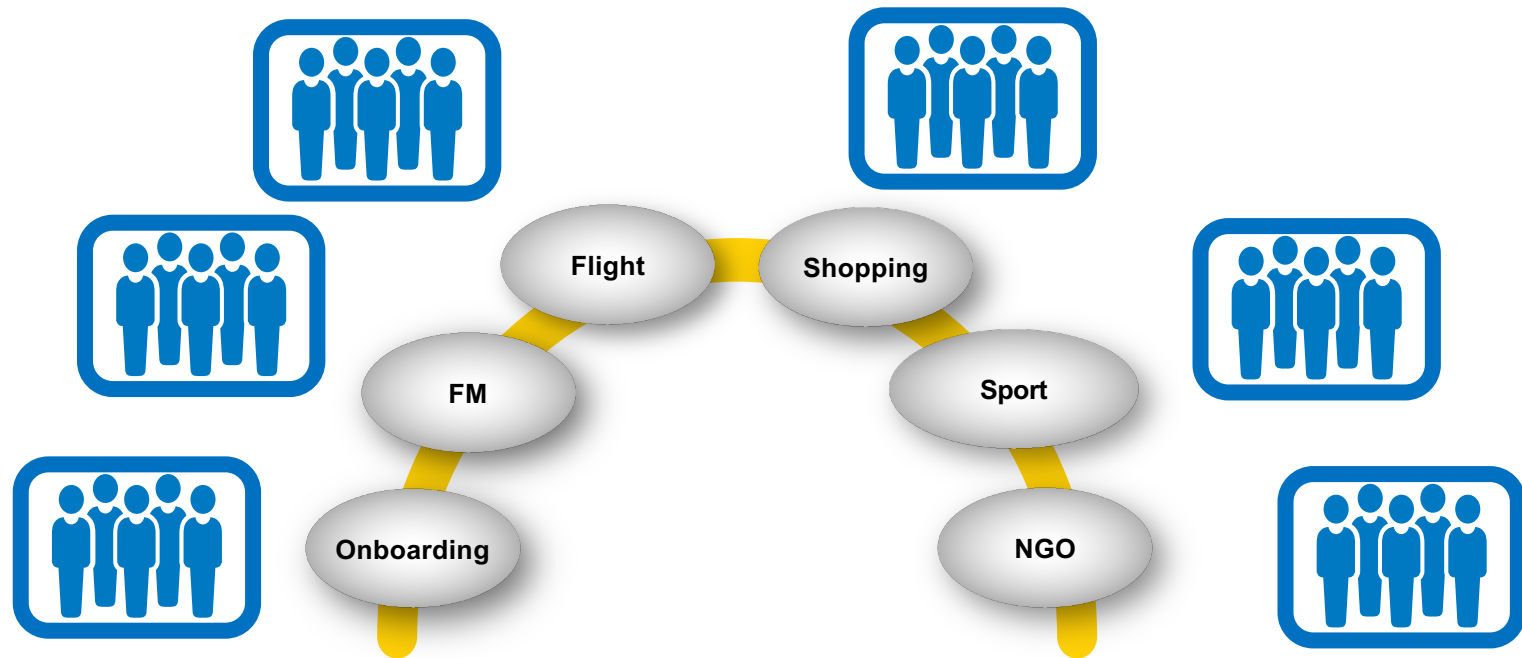
IT Operations

The platform is **highly available** and the necessary IT maintenance activities are **planned and communicated** at an early stage.



Give some examples of digital services in the following areas

1. Employee Onboarding
2. Facility Management (FM)
3. Flight booking
4. Shopping
5. Sport Equipment
6. Non-Governmental Organization (NGO)



Collect and analyze customer data to tailor experiences through dynamic content and personalized communication





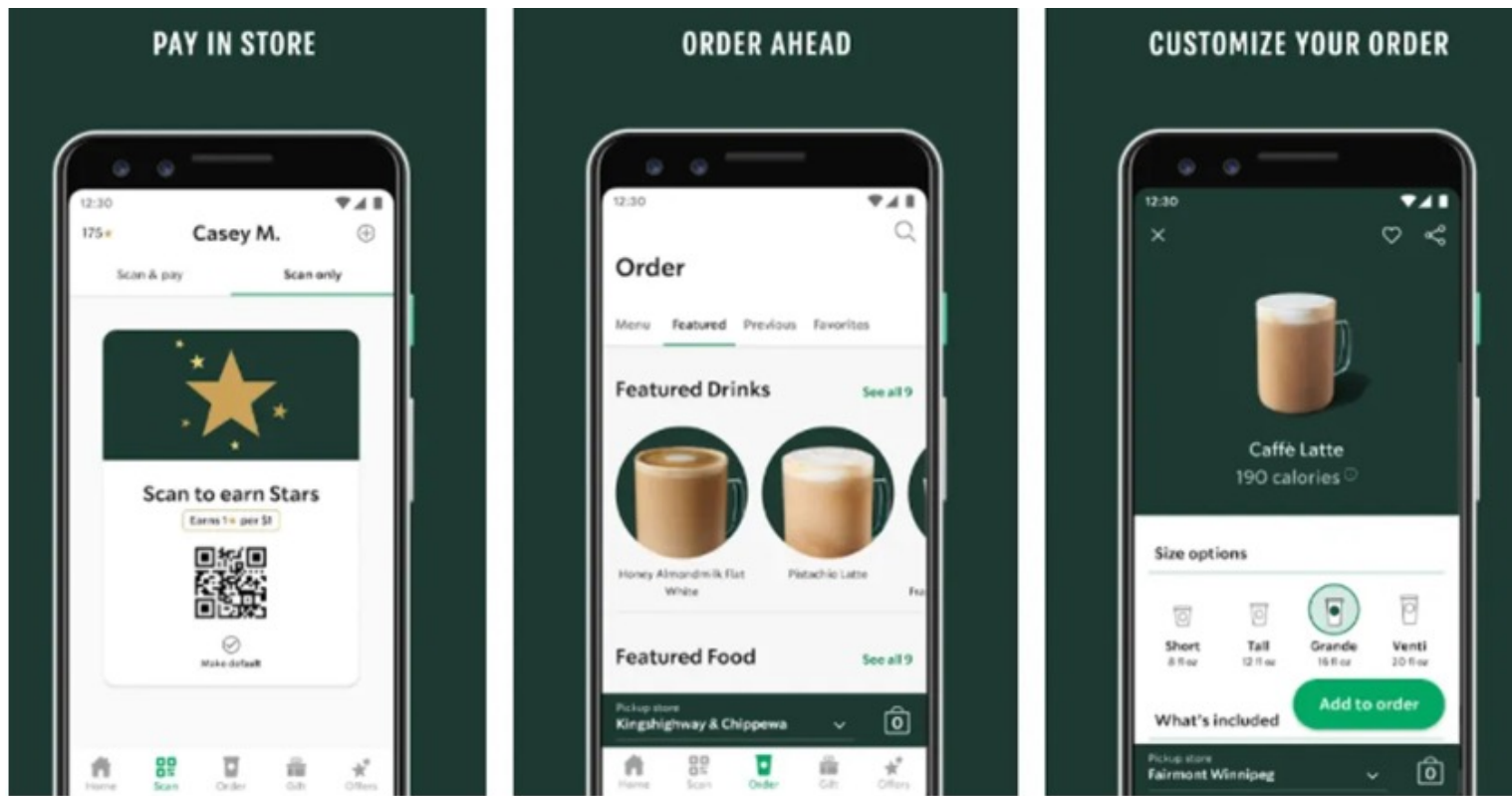
Types: user-generated notifications, push notifications, context-generated notifications, system-generated notifications, In-App notifications, notifications requiring action from the user, passive notifications, and smart notifications

Rewards Automation



Customers who achieve specific milestones can be sent rewards or incentive automatically. Not only boosts customer satisfaction but also keeps them loyal to your brand.

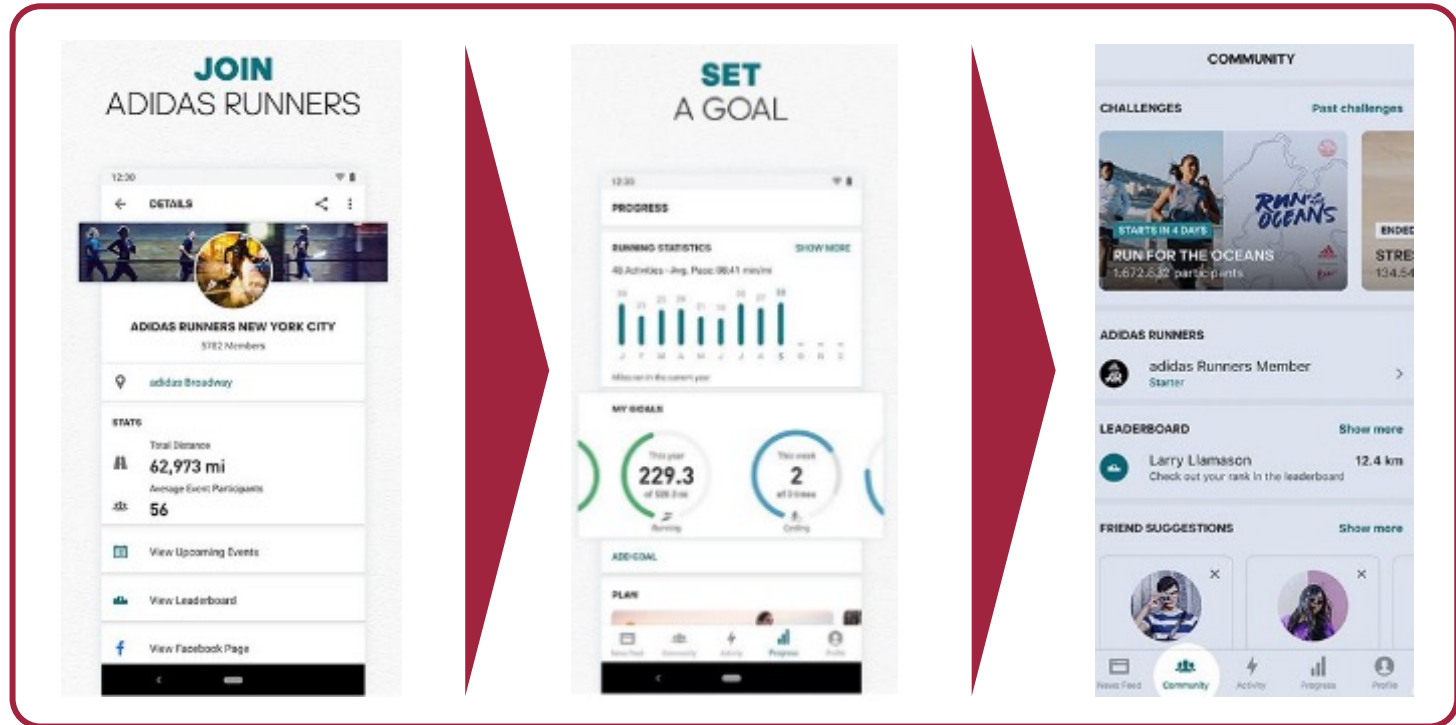
Example:
Starbucks





Use of game-like mechanics (points, badges, leaderboards, challenges...)

Example:
ADIDAS



USER ENGAGEMENT



CHALLENGE



ACHIEVEMENT



MOTIVATION



REWARD



LEARNING



How much is enough or too much?



Duolingo

A language-learning app that uses game-like mechanics, such as levels, points, badges, and leaderboards, to motivate users to learn a new language.

Nike+

A fitness app that tracks users' physical activity and rewards them with badges and trophies for achieving milestones and competing with friends.

Microsoft Rewards

A loyalty program that offers users points for using Microsoft products and services, which they can redeem for gift cards, sweepstakes, and charitable donations.

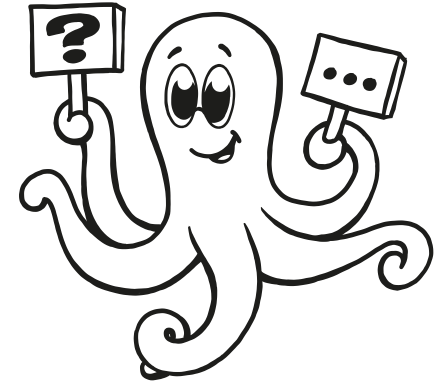
Foldit

An online puzzle game that challenges players to fold proteins, which helps scientists better understand protein structures and develop new drugs.

Marriott

A hotel chain that offers a gamified loyalty program, Marriott Bonvoy, where members can earn points, unlock exclusive perks, and level up their status by staying at Marriott properties and completing various activities.

Overall, gamification can be a powerful tool to increase engagement, motivation, and learning outcomes, as long as it is designed with the user's needs, preferences, and goals in mind.





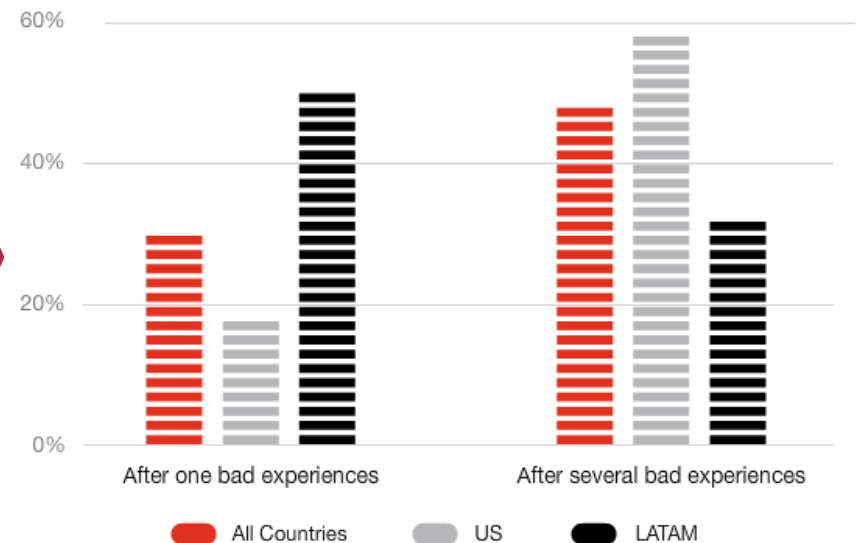
- **Easy to find**
- **Easy to buy**
- **Sell more** (Customers are more likely to try additional services or products from brands that provide superior customer experience)
- Customers should be able to do (almost) **anything employees** can do



ADD TO CART



When do consumers stop interacting with a brand they love?



What is your experience when using digital services?



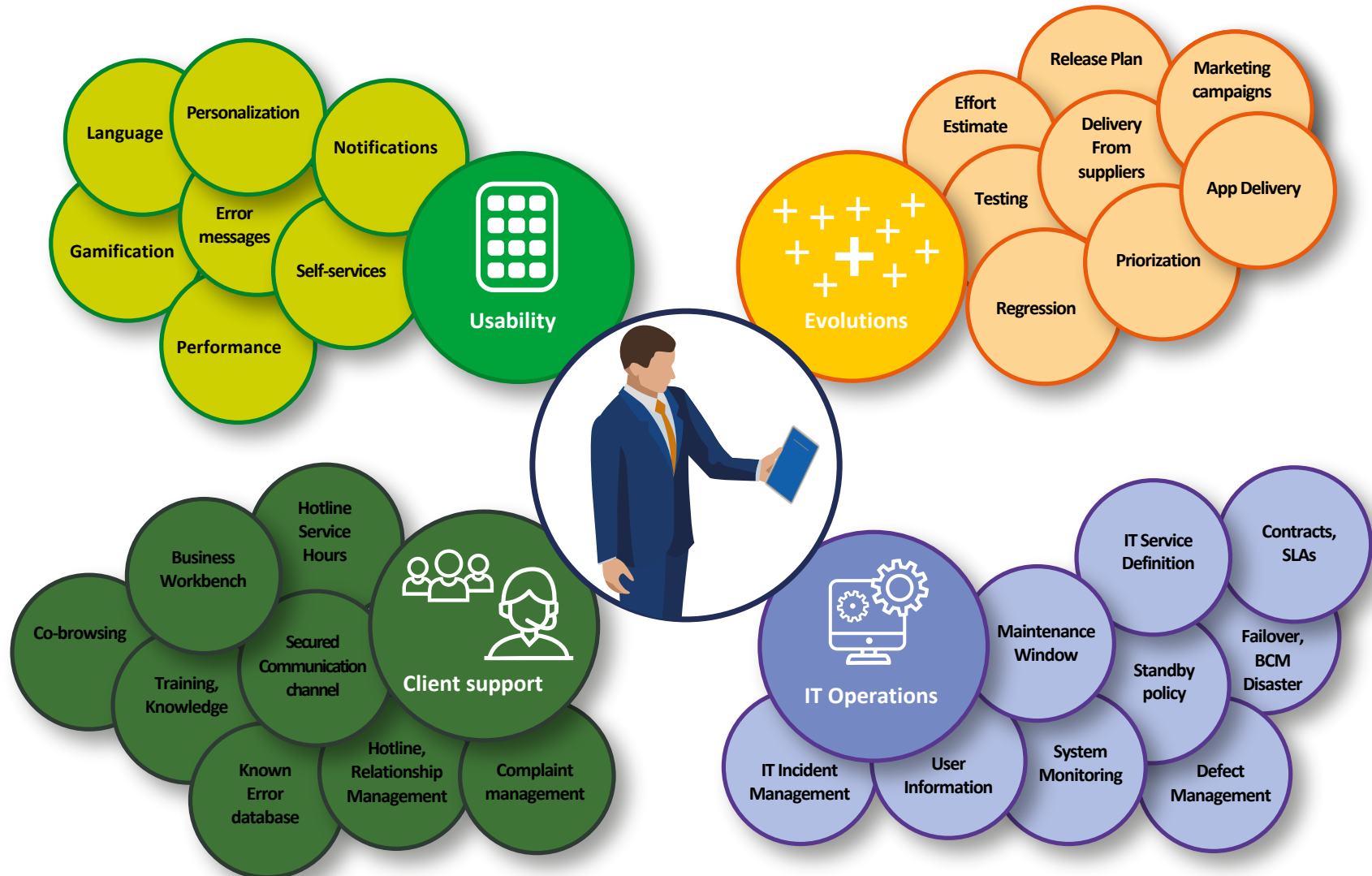
©Glasbergen
glasbergen.com



“Your call is very important to us. Without people like you, who would we make fun of on our break?”



Balancing usability, support, evolution, and operations



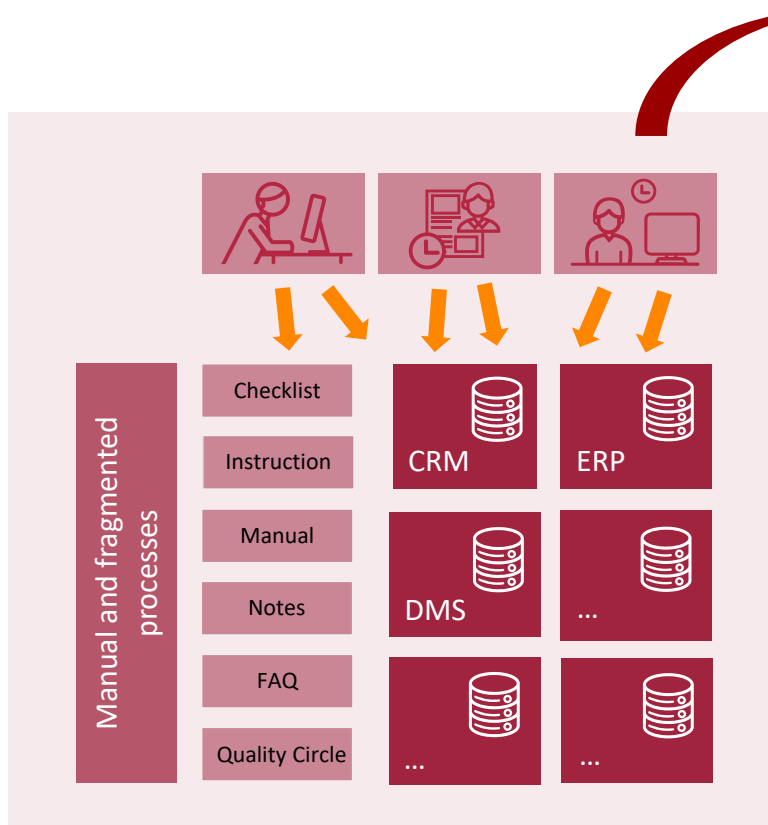




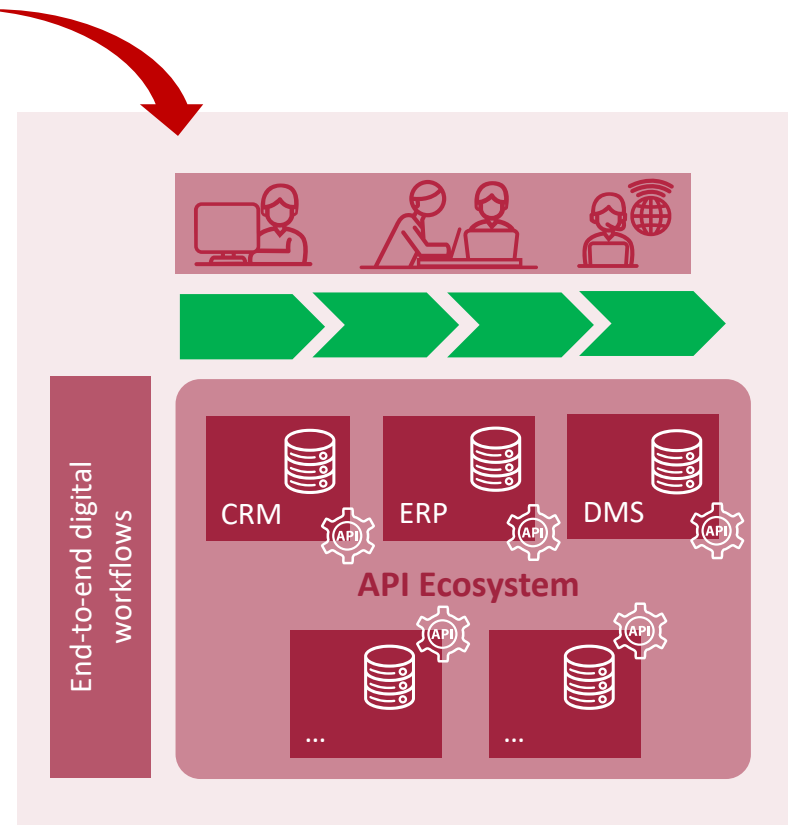
- **Increased productivity:** Automation streamlines workflows and reduces manual effort
- **Lower operational costs:** Reducing manual work and errors leads to cost savings
- **Improved data accuracy and insights:** Digital systems minimize human error and provide real-time data for better decision-making
- **Enhanced employee morale:** Employees are more engaged when they can focus on strategic tasks rather than repetitive ones
- **Greater scalability:** Digitized processes are easier to scale up or down to meet fluctuating demand



Shift from "What" to "How"



Each user needs to know all the different systems and the specific processes

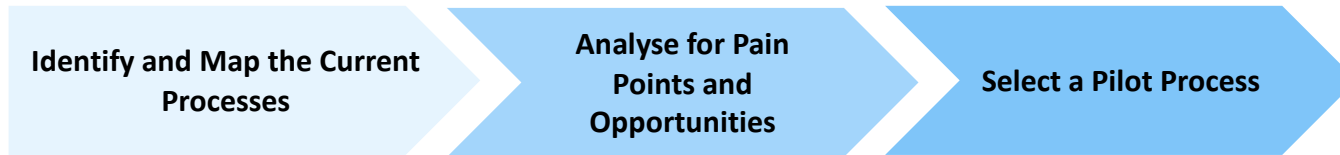


Processes are so far automated, and users are guided thanks to workflows

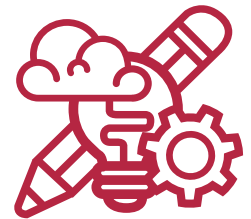


Start Small, Think Big

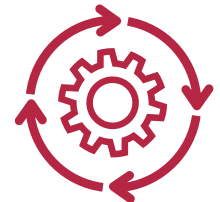
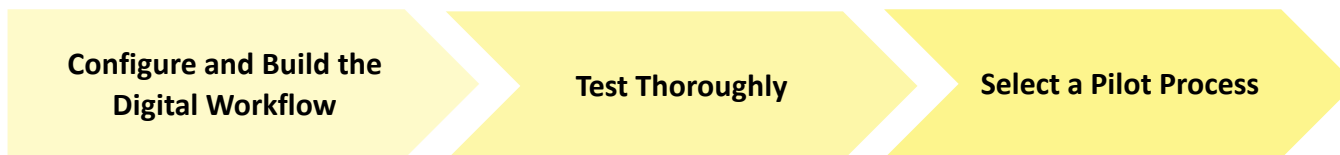
Phase 1: Analysis & Selection (The "What" and "Why")



Phase 2: Design & Planning (The "How")



Phase 3: Implementation & Integration (The "Do")



Phase 4: Roll-out & Improvement (The "Refine")



Examples of Business Processes to be Automated



Finance & Accounting

- **Accounts Payable / Receivable:** automated invoice processing, payments, reminders
- **Payroll & Employee Compensation:** digital salary processing, tax calculations
- **Budgeting & Forecasting:** digital reporting, scenario planning
- **Financial Reporting & Compliance:** automatic consolidation, audit-ready digital records
- **Expense Management:** automated claim submission and approval

Human Resources & Administration

- **Employee Onboarding / Offboarding:** digital forms, e-signatures, training modules
- **Attendance & Time Tracking:** automated clocks, leave management
- **Performance Management:** digital reviews, goal tracking, analytics
- **Recruitment & Talent Management:** applicant tracking systems, digital interviews
- **Document Management:** storing contracts, certifications, policies digitally

Procurement & Supply Chain

- **Purchase Orders & Requisitions:** automated approvals and tracking
- **Vendor Management:** digital onboarding, performance tracking
- **Inventory & Stock Management:** real-time inventory updates, alerts for reorders
- **Logistics & Shipping Management:** digital tracking of shipments and delivery
- **Warehouse Operations:** scanning, automated picking, stock auditing

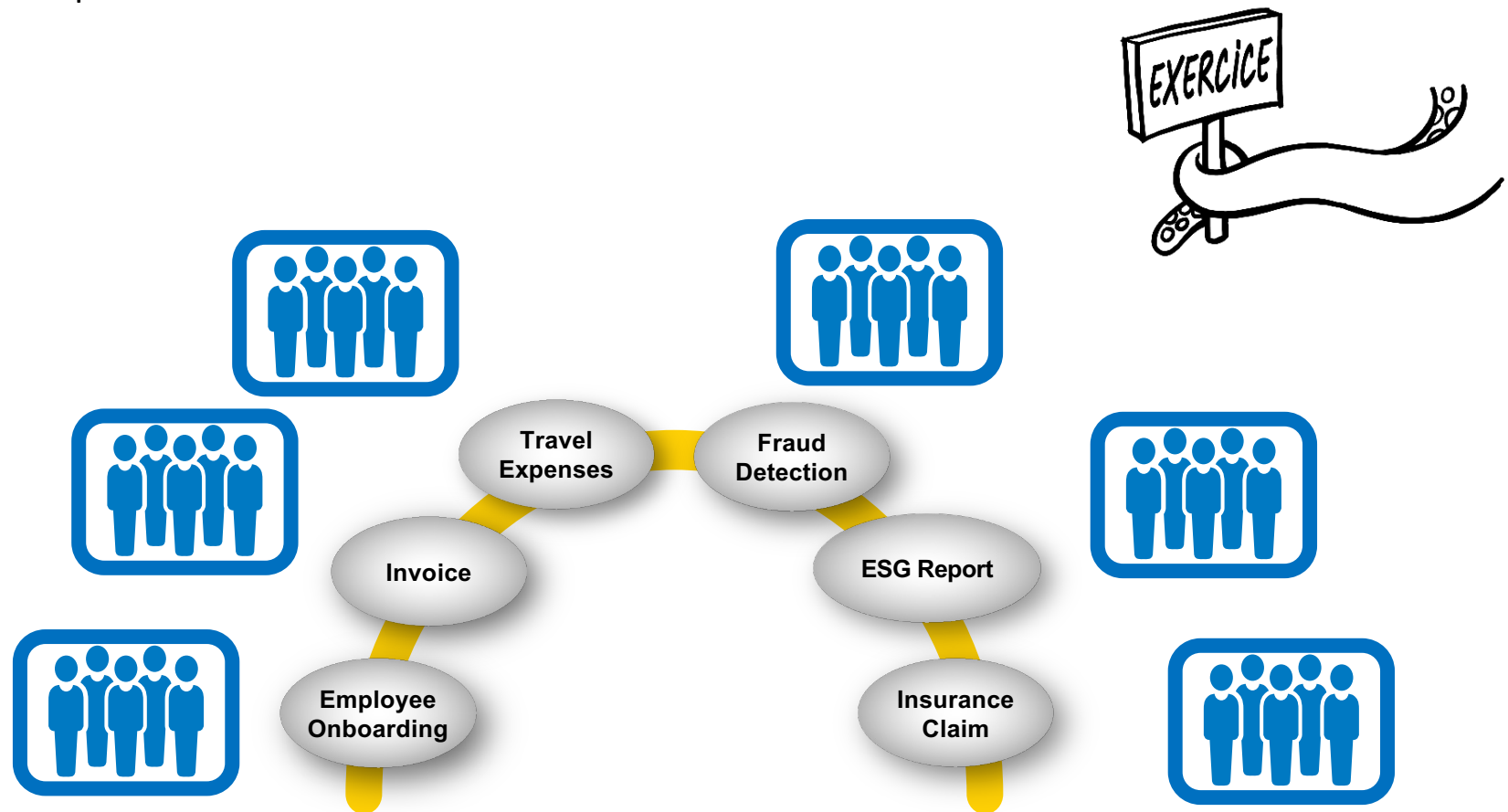
Legal & Compliance

- **Contract Management:** digital contract creation, signing, and storage
- **Regulatory Compliance:** digital audit trails, reporting
- **Risk Management:** automated monitoring and alerts



Design an automated process for the following use cases:

1. Employee Onboarding
2. Invoice Processing
3. Travel Expense Reimbursement
4. Automated Fraud Detection
5. ESG (Environmental, Social, Governance) Reporting
6. Health Insurance Claims



Example 1: Digital Payments

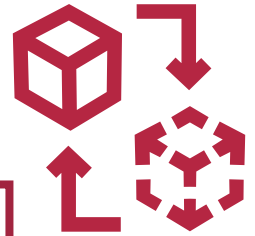




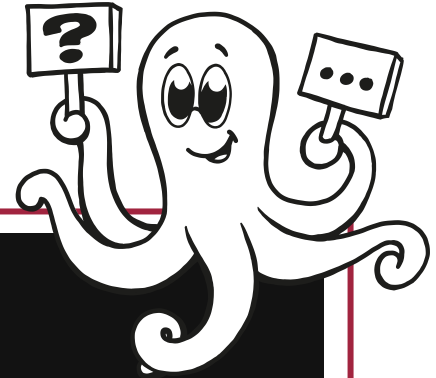
Example 3: Smart Factory



Example 4: Digital Twins



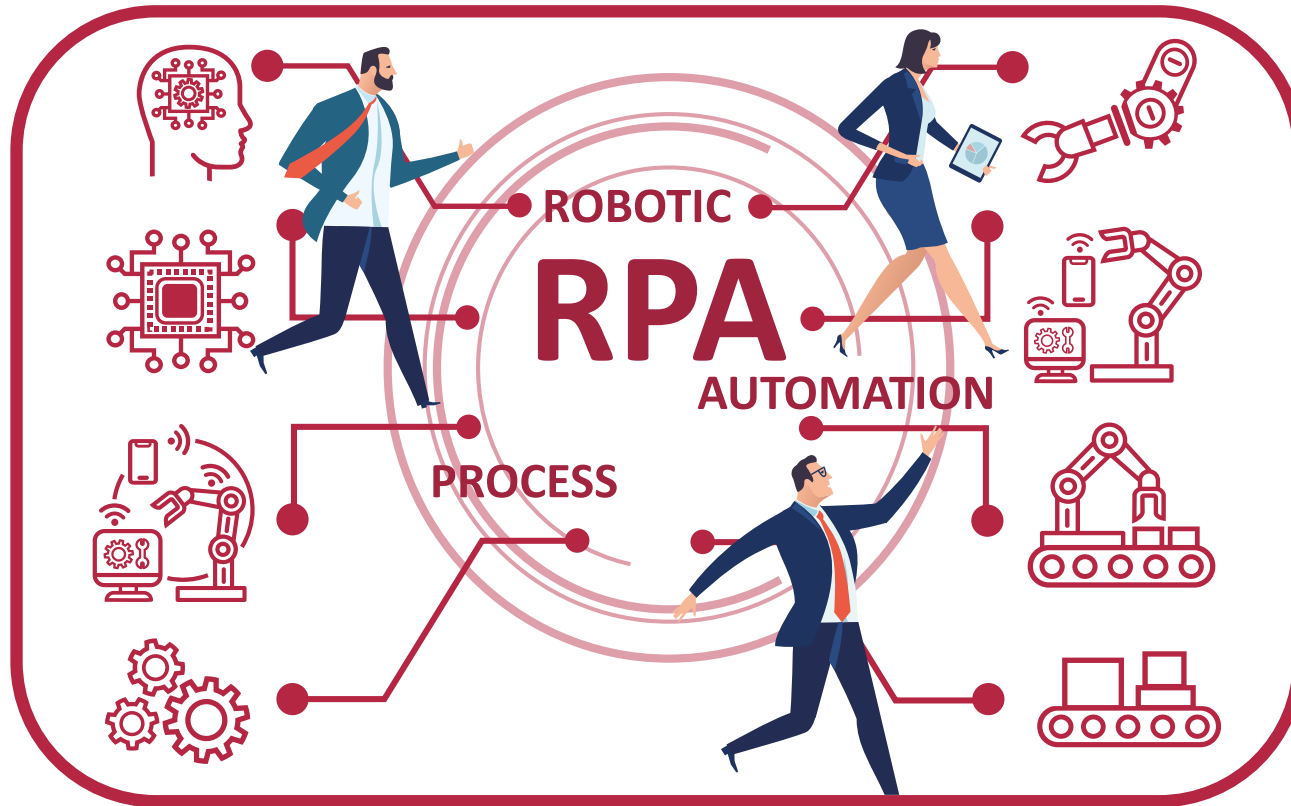
Tools to Digitalize Processes?



Robotic Process Automation (RPA)



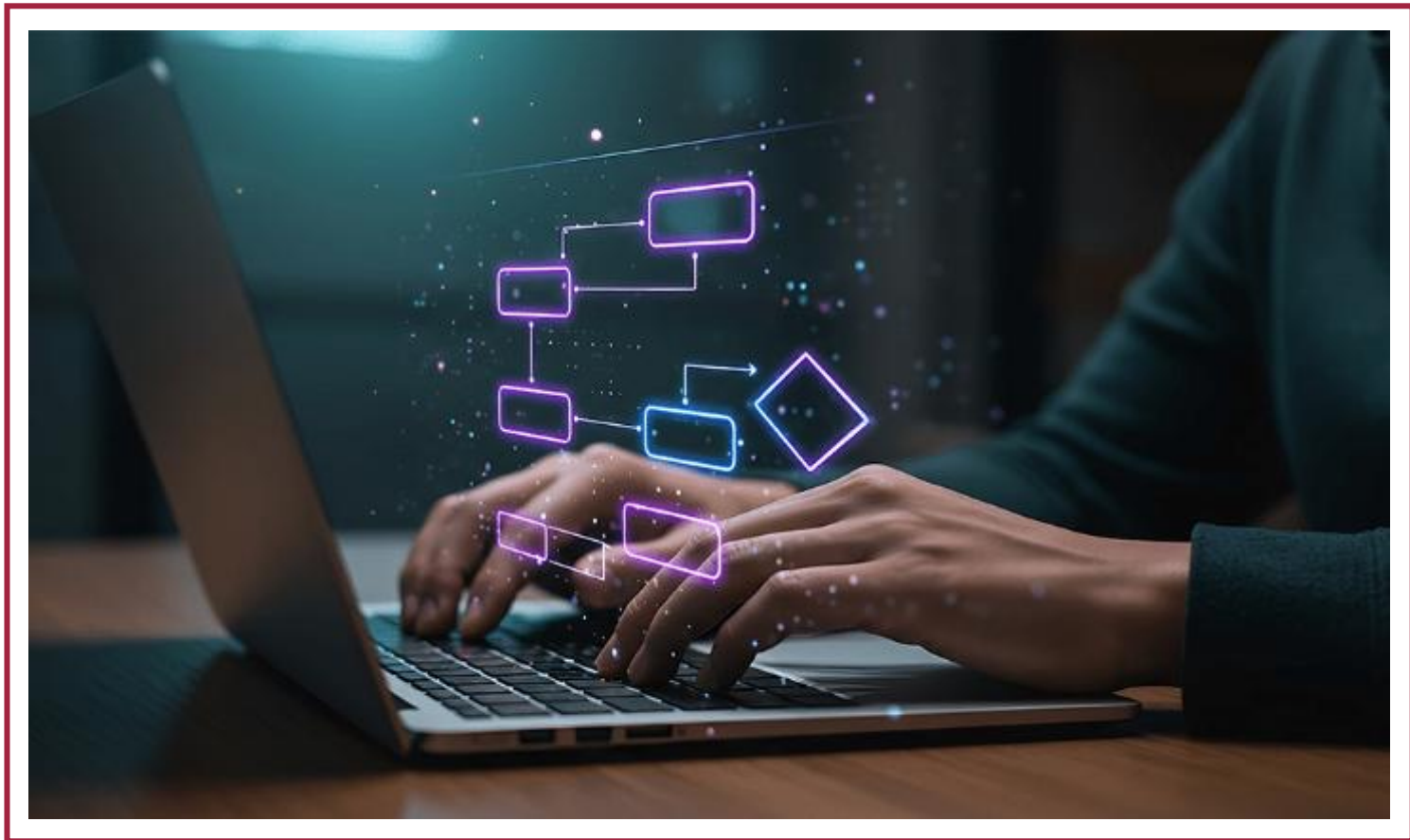
Software that automates repetitive, rule-based digital tasks by mimicking how a human interacts with computer applications



Tools: UiPath, Automation Anywhere, Blue Prism, Microsoft Power Automate



Tools that build software applications with visual, drag-and-drop interfaces instead of traditional hand-written programming

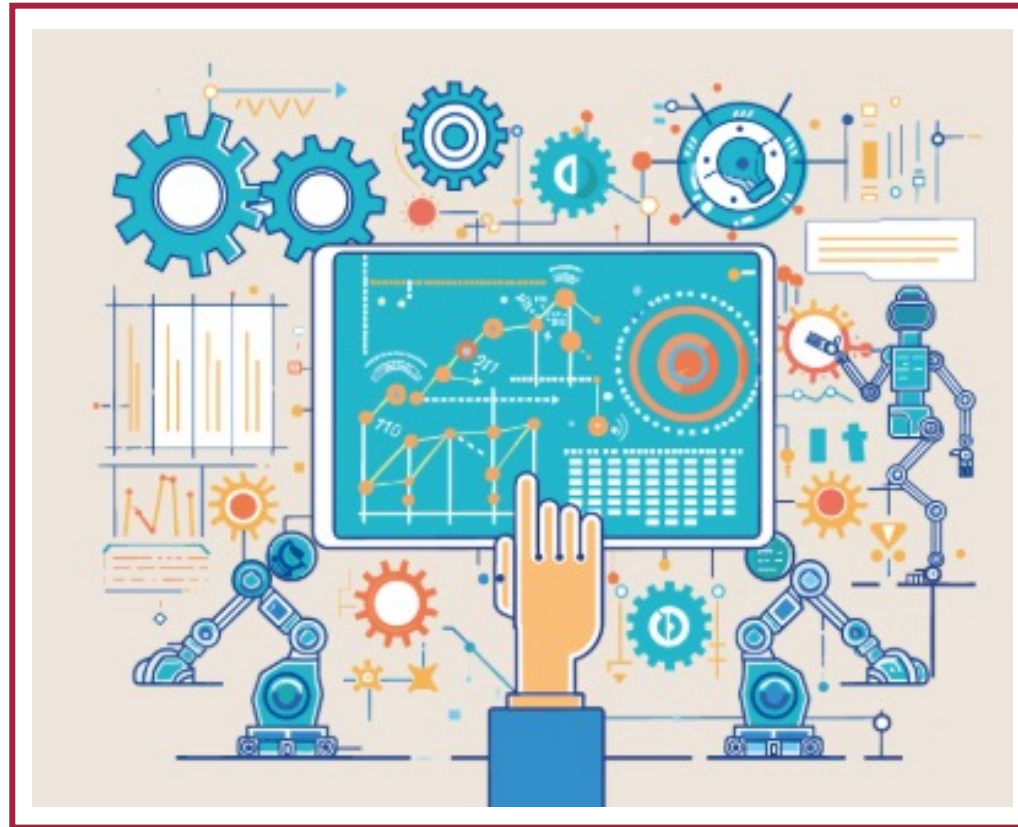


Tools: Microsoft Power Apps, Mendix, OutSystems, Appian, Airtable

Workflow Automation Suites



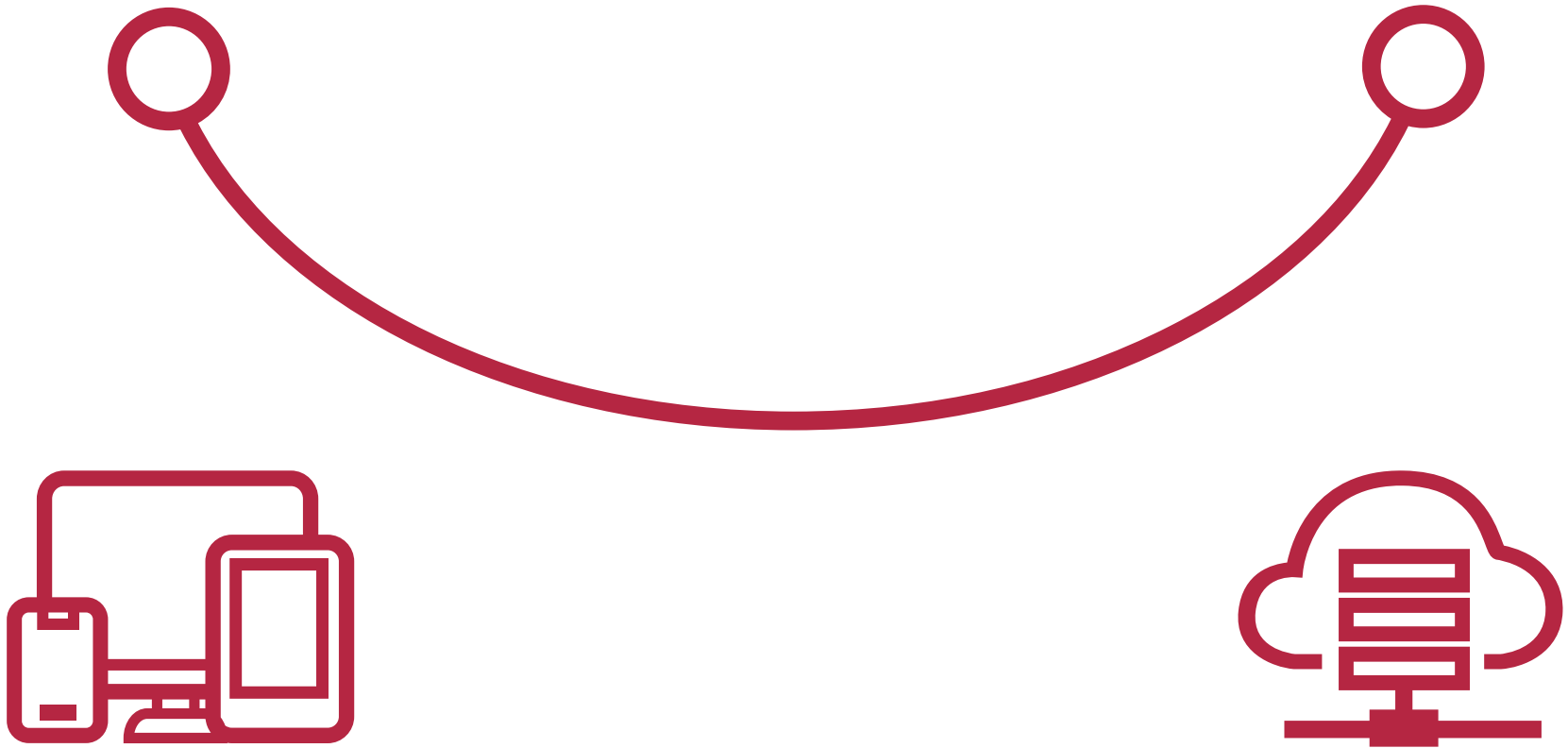
Software toolset that model, execute, and optimize business processes by orchestrating tasks between people, systems, and data



Tools: Appian, Pegasystems, Camunda, Kissflow, ServiceNow

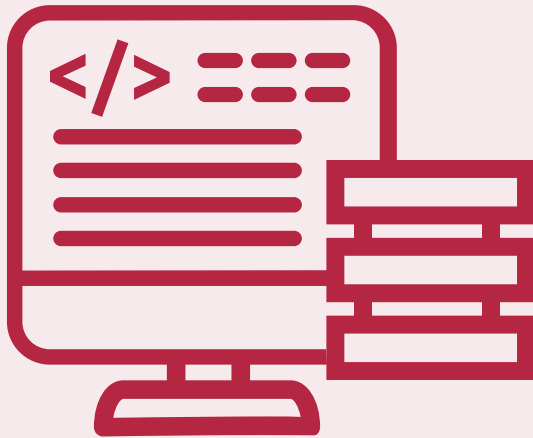


END TO END

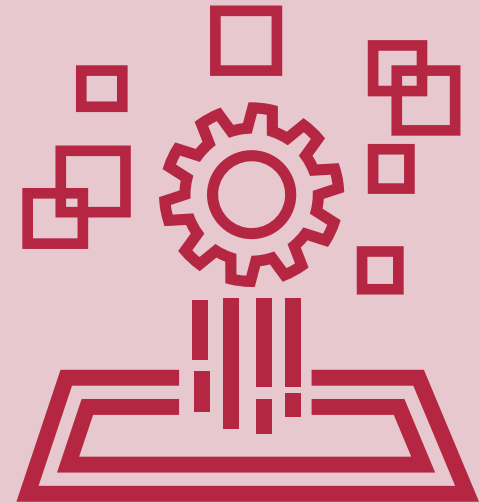




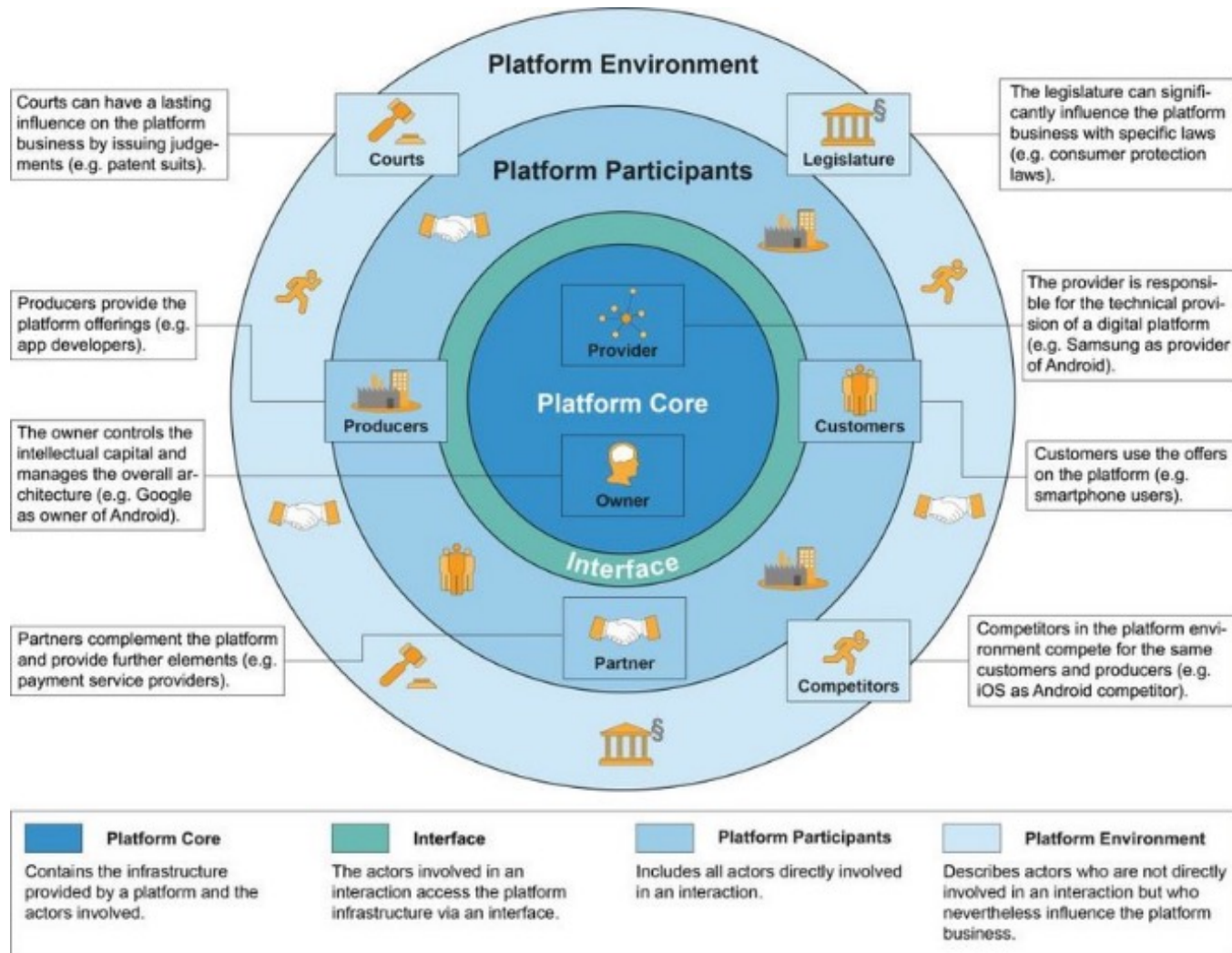
Own Programming (Custom Code)

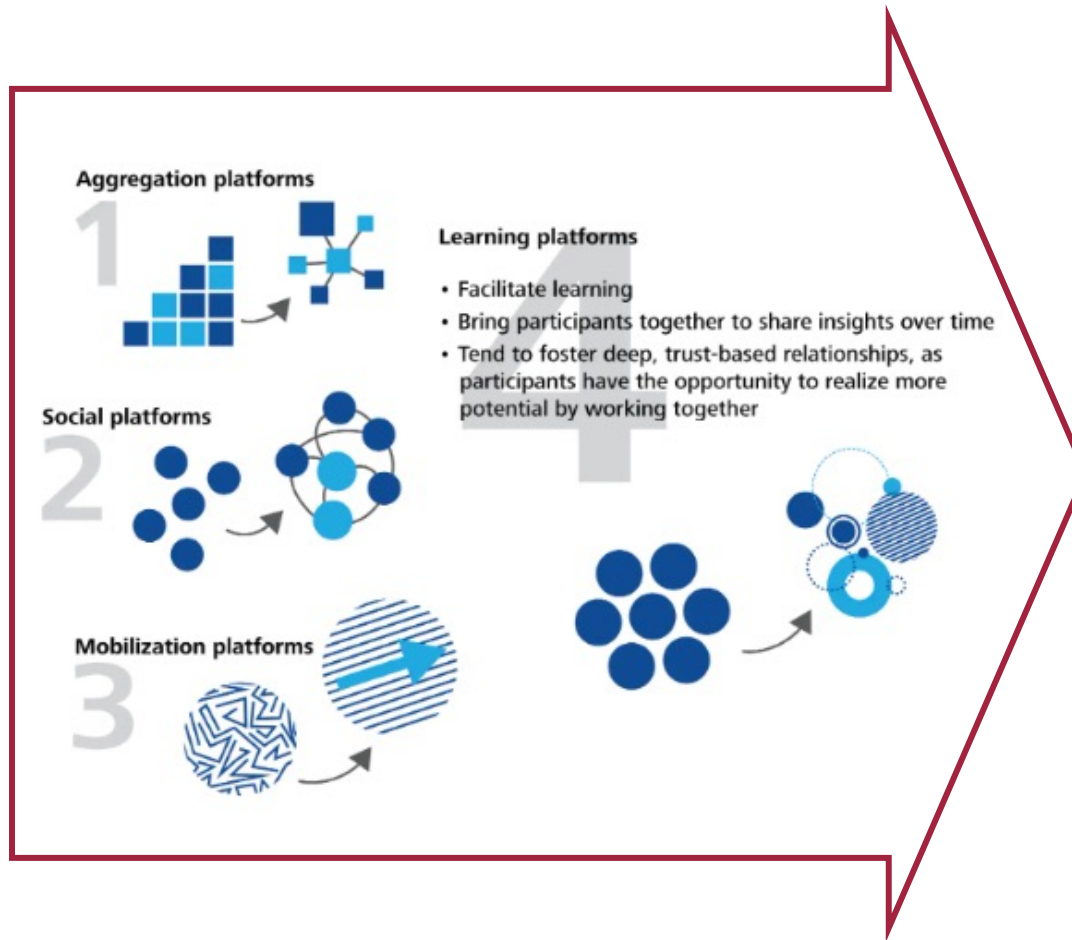


Using a digital platform



Definition of a Platform





1. Aggregation platforms

Bring together a broad array of relevant resources and help users of the platform connect with the most appropriate resources. These platforms tend to be transaction- or task-based and include marketplace and broker platforms.

2. Social platforms

Include some of the most widely known social networking sites and bring together many stakeholders

3. Mobilization platforms

Take common interests to action. These platforms go beyond conversations and interests and focus on moving people to act together to accomplish larger goals. These platforms span a broad range of industries, including financial services, consumer products, and automotive.

4. Learning platforms

Multisided networks that facilitate the transfer of knowledge, bringing together participants to share insights over time

What are the Advantages of a Digital Platform?







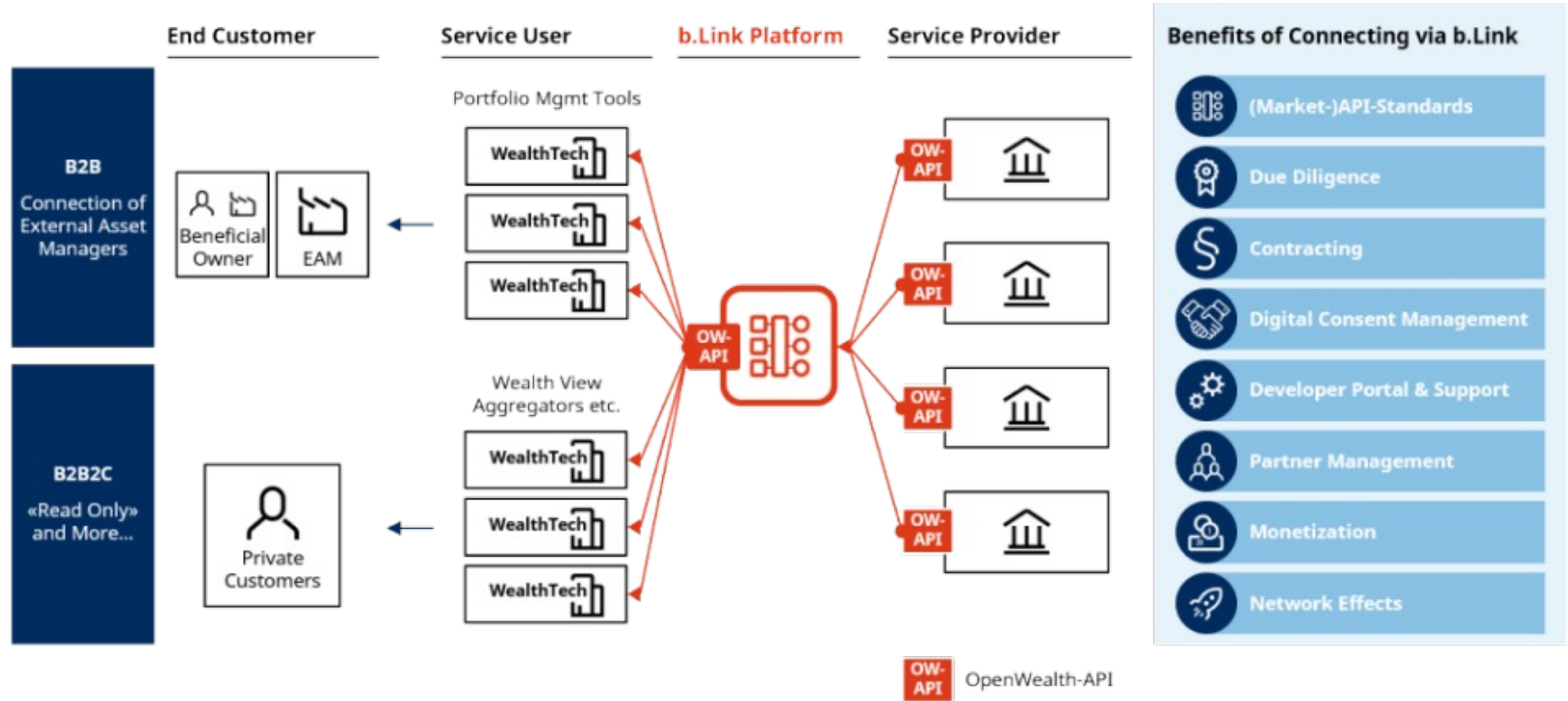
Best time to post

- **Facebook**
Best Time: 7 am to 9 am, 1 pm to 3 pm, and 7 pm to 9 pm.
Best Day: Mid-week days, specifically Wednesday and Thursday.
- **Instagram**
Best Time: 7 am to 9 am and 11 pm to 2 pm.
Best Day: Mid-week days.
- **Twitter**
Best Time: In the morning, 9 am to 11 am, and during lunch hours is also a good option around 1:00 pm.
Best Day: Wednesday and Thursday.
- **YouTube**
Best Time: Between 2 pm to 4 pm on weekdays and 9 am to 11 am on weekends.
Best Day: Sunday.
- **TikTok**
Best Time: 10 am and 12 pm.
Best Day: Tuesday and Thursday.
- **LinkedIn**
Best Time: 10 am to 6 pm.
Best Day: Tuesday and Thursday.
- **Pinterest**
Best Time: 8 pm, 4 pm, and 9 pm
Best Day: Sunday, Monday, and Tuesday

Example 2: Open Banking



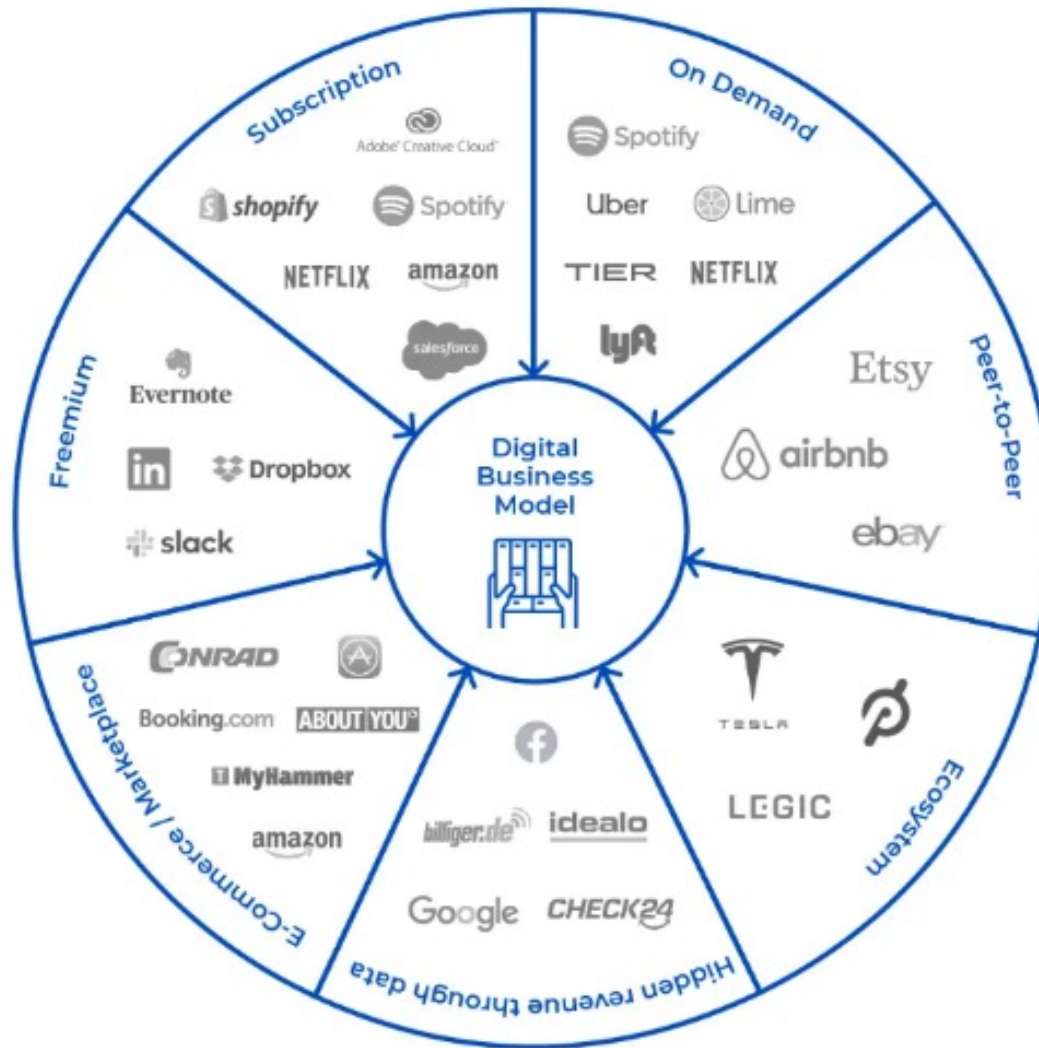
b.Link Platform from SIX



Example 3: Amazon Ecosystem



Patterns of Digital Business Models

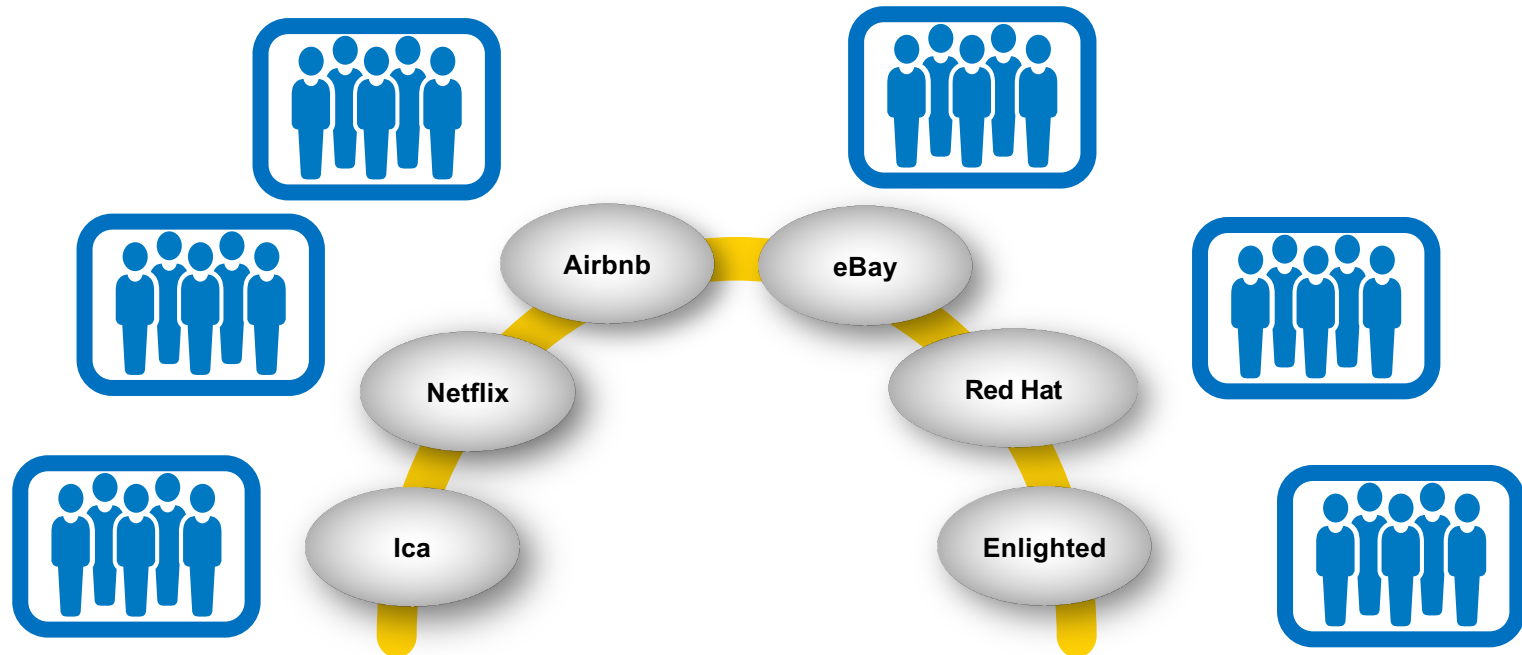


Which Value Proposition?

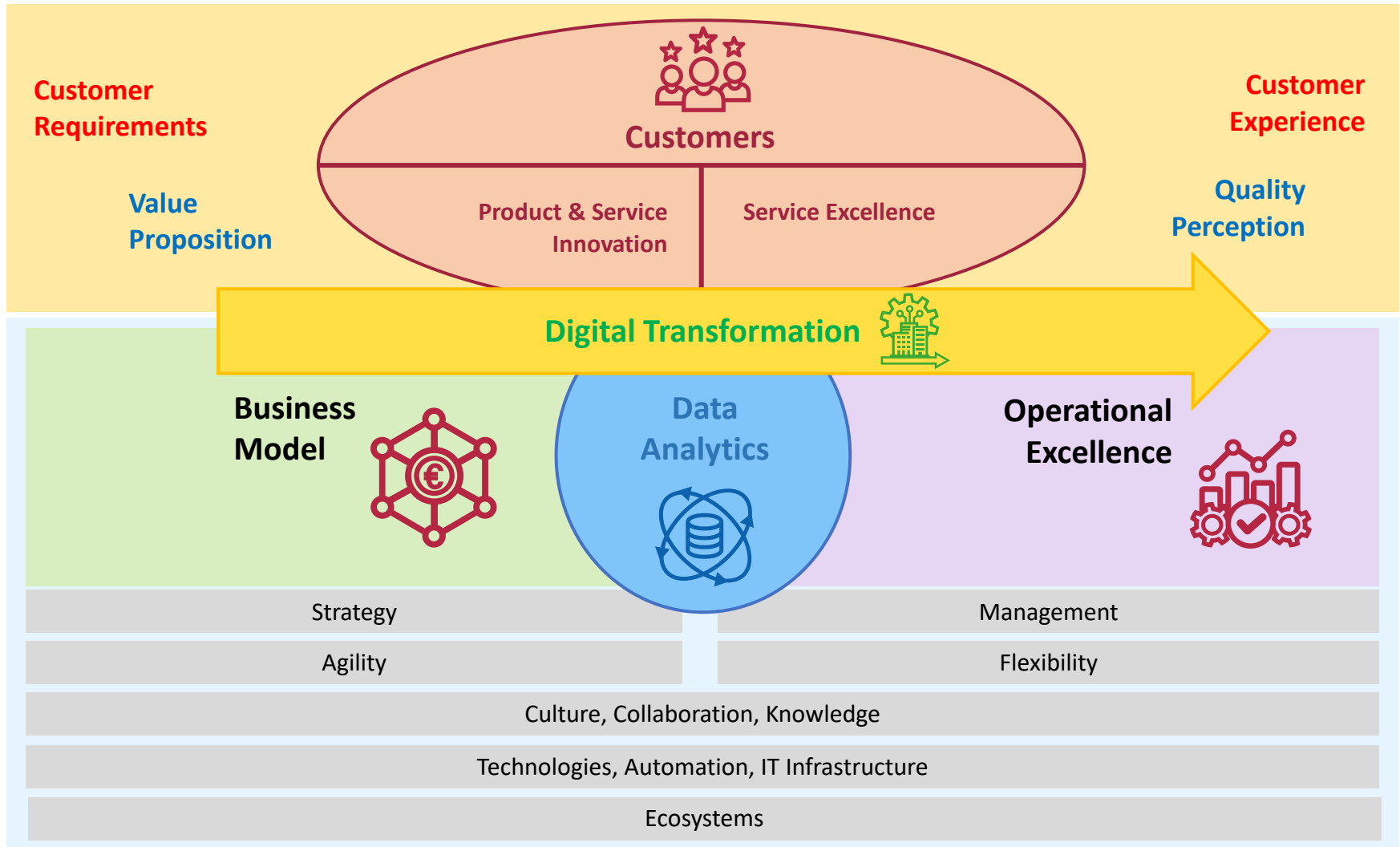


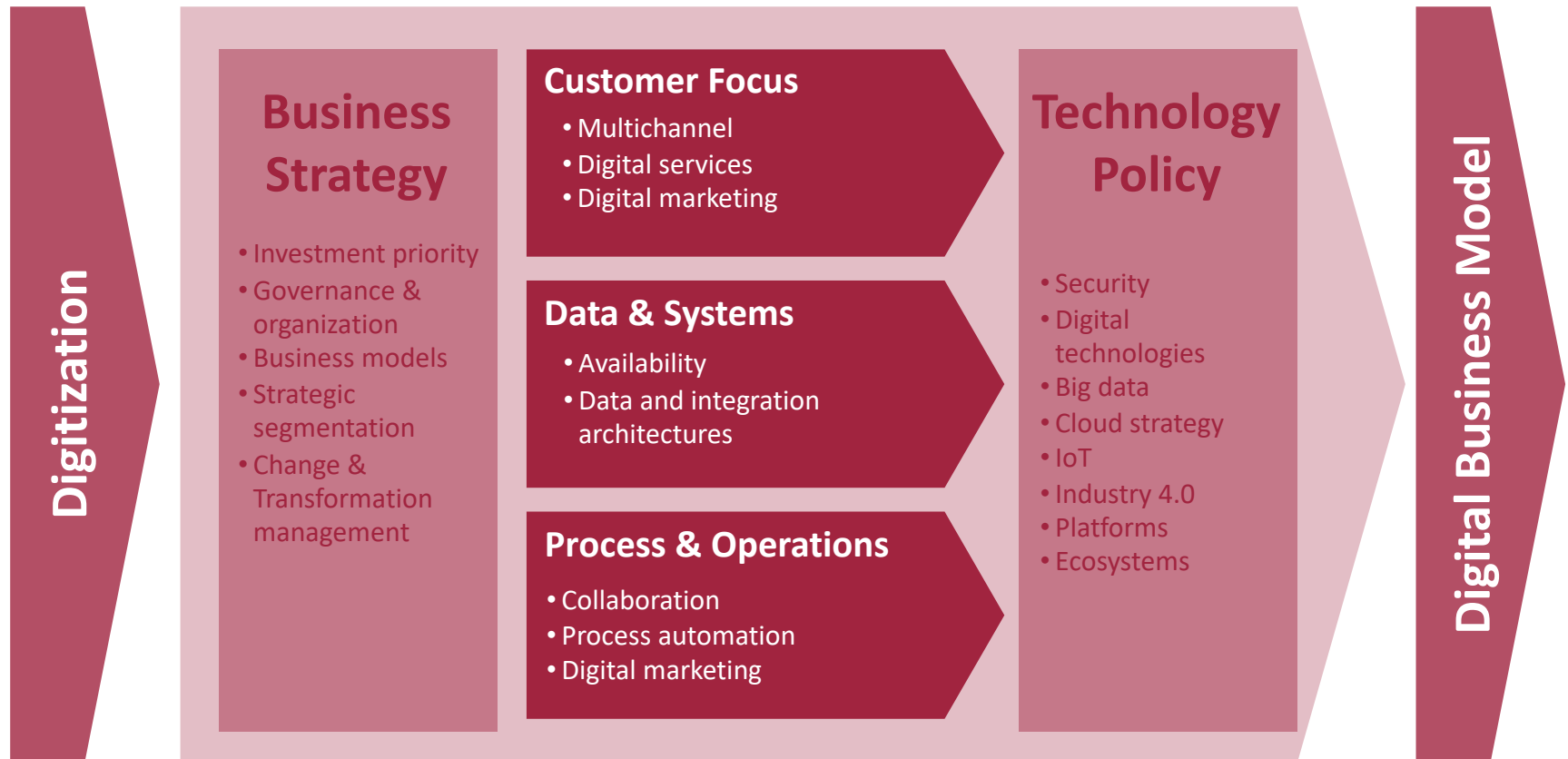
Use the Business Model Canvas to describe the following digital providers?

1. ica.se
2. netflix.com
3. airbnb.com
4. ebay.com
5. redhat.com
6. Enlightedinc.com

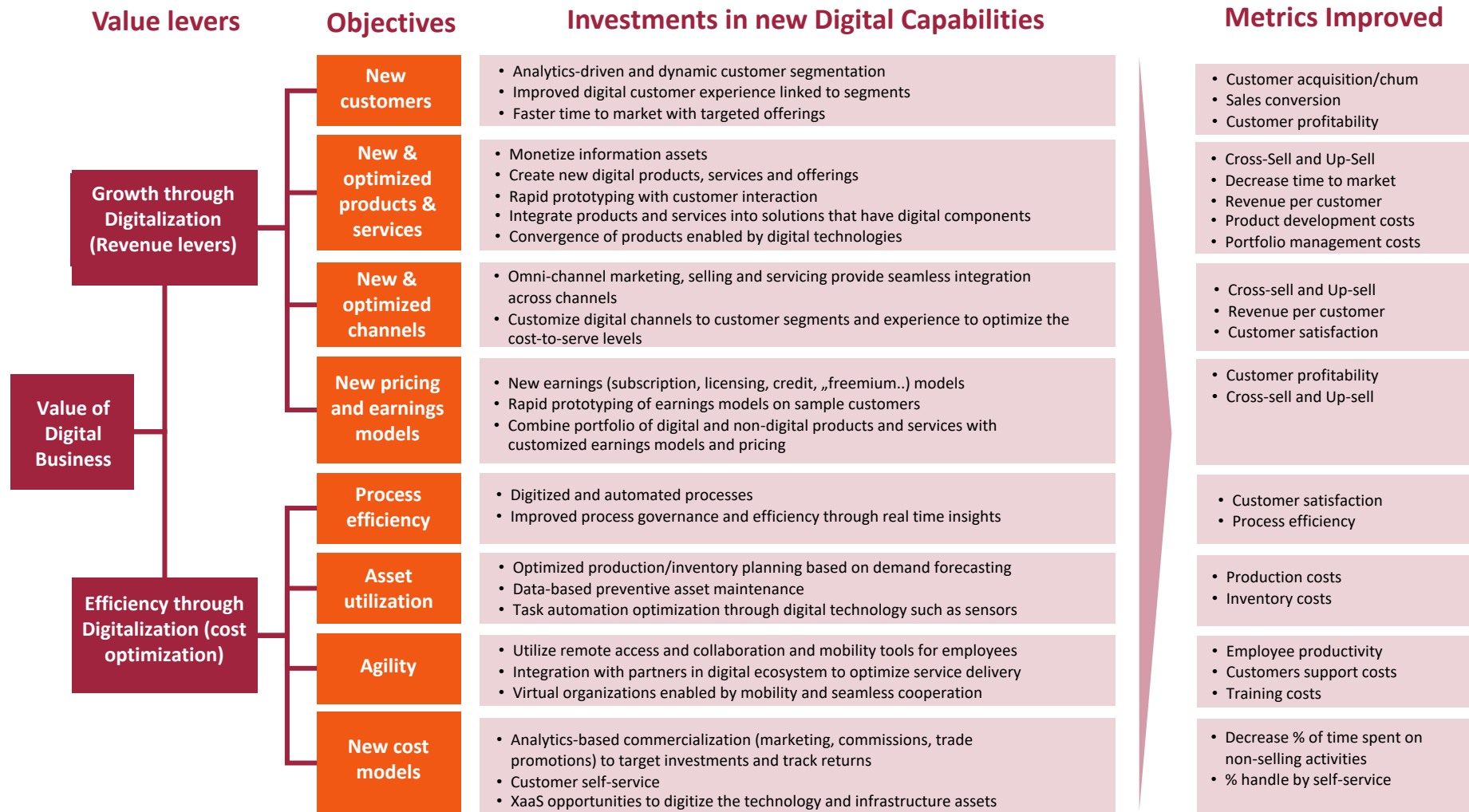








Value Tree of Digital Business





Improved Customer Experience: more responsive, personal, and easy

1. The Value of Personalization

Digitalization allows a company to not just know that "customers have shipping grievances," but to know that *a specific customer* prefers delivery to their office and is waiting for a time-sensitive package. This enables personalized solutions, which dramatically enhance perceived value.

2. The Value of Effortless Service (Convenience & Self-Service)

A major value digitalization brings is reducing the customer's effort

- **AI-Powered Chatbots & Self-Service Portals:** Providing instant, 24/7 answers to common questions.
- **Proactive Notifications:** Automatically informing customers about order status, delays, or resolutions without them having to ask.

3. The Value of Seamless Omnichannel Experience

The real customer value is created when separate data sources (CRM, social media, etc.) are integrated. A customer shouldn't have to repeat their issue when moving from a chat bot to a phone agent. Digitalization enables a seamless journey across all touchpoints, which is a significant customer value proposition.



Build Innovative Products

1. Importance of a Clear Vision and Strategy

Successful innovation requires a clear understanding of the problem being solved and the value being delivered.

2. Innovation Requires Flexibility and Experimentation

Businesses must be adaptable and willing to test different approaches to find what works.

3. Rapidly Changing Digital Landscape

New technologies and platforms emerge constantly, making it challenging to maintain a clear roadmap. Even innovative products can quickly become outdated if businesses do not continuously monitor trends and invest in R&D

4. Continuous Improvement and Staying Ahead

Data-driven innovation allows businesses to adapt products based on actual usage and feedback.



Enhanced Business Process Automation (BPA) by doing the right things

1. Automation Increases Efficiency and Accuracy

BPA reduces or eliminates repetitive manual work, minimizes human errors, and optimizes operational efficiency.

2. End-to-End Process Flow

True efficiency comes from using data to map and understand the entire process flow.

2. Strategic Value of Data-Enabled Automation

Combining BPA with data analytics ensures that automation is targeted, effective, and aligned with organizational goals. Businesses that leverage this approach save time, reduce costs, and improve operational performance consistently.

3. Challenges in Implementing Automation

Identifying which processes to automate can be difficult; not all tasks benefit equally from automation. Employee resistance, variability in processes, and learning curves for new systems can create temporary inefficiencies. Poorly planned automation can waste resources instead of improving efficiency.



Enhanced Collaboration and Communication with Business Partners

1. Improving Collaboration Despite Organizational Difference

Business partners often work with different cultures, processes, systems, and priorities, making coordination difficult. Digital tools and shared data help ensure all partners operate from a common understanding and shared expectation.

2. The Value of Transparency and Trust

Data creates radical transparency. A shared dashboard showing real-time performance metrics (e.g., on-time delivery, sales leads, inventory levels) eliminates guesswork and builds trust. Partners can proactively address issues before they escalate into conflicts, moving the relationship from reactive to proactive.

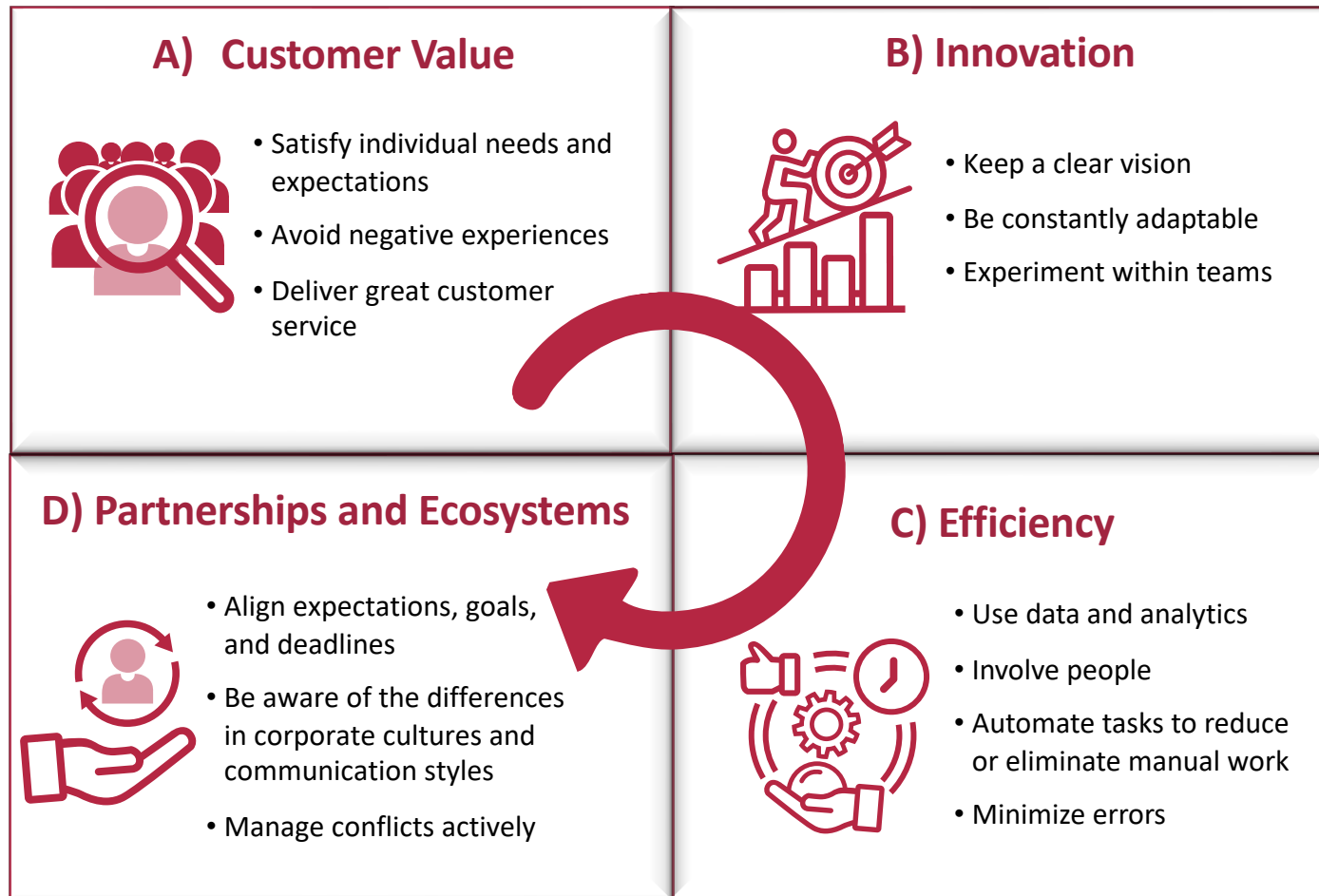
3. Optimizing Supplier and Partner Performance

By analysing supplier performance data, companies can identify high-performing suppliers and opportunities for cost savings.

4. Strengthening Channel Partner Collaboration

Data analytics can track which channel partners are most active or effective. This helps identify where additional support, training, or resources are needed. Businesses can more effectively target joint activities, marketing, and investments to drive partner success.

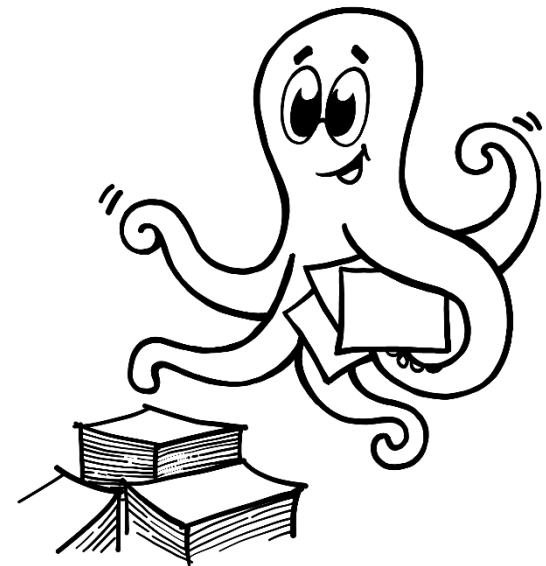
Connecting customer value, innovation, and delivery



Take away and must know!



- Definition of digitalization and digital data
- Definition of a digital service and the relevance for all companies
- Digital possibilities to bring value to customers (Front)
- Digital opportunities to bring value to efficiency (Back-end / Process automation)
- Digital opportunities to bring value to business partners (platform / ecosystem)
- Digital opportunities to develop new business models





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