Capgemini
CONSULTING.TECHNOLOGY.OUTSOURCING

Architects, Design for Digital

Digital. Two steps ahead

Dr. Uwe Dumslaff

ECSA 2014, Vienna

DIGITAL
Customer Experience

People matter, results count.

A strong Group (2013 full year)

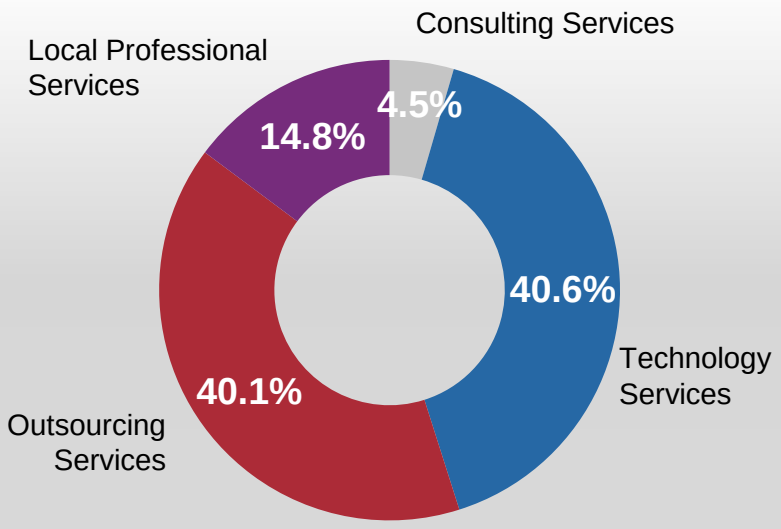
Revenue 2013: €10,092 million

- Operating margin : €857 million
- Operating profit : €720 million
- Profit for the year attributable to shareholders : €442 million
- Net cash and cash equivalents : €678 million

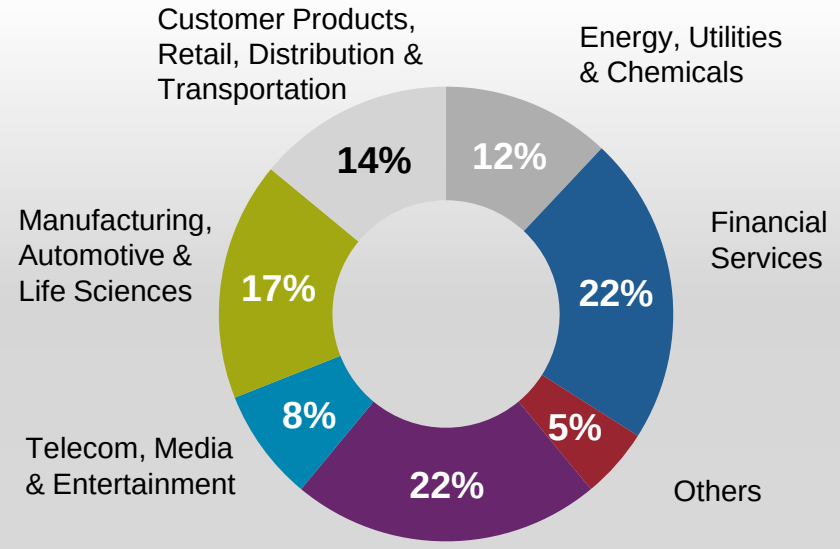
Cap Gemini S.A." is a member of the CAC40, listed in Paris
ISIN code: FR0000125338

Note: Our brand name is "Capgemini" but the name of our share on the stock exchange is "Cap Gemini S.A."

Revenue by business



Revenue by industry



Our Strategic Offers:
Digital, Technology and Sector Transformation

Digital

- Digital Transformation
- Digital Customer Experience

Process

- Global Engineering Services
- Marketing Analytics - Insight Center
- Finance & Accounting
- Supply Chain Management & Procurement Services
- Front Office Transaction Services (Prosodie Capgemini)

Applications

- BPM
- Testing
- Security
- Mobile Solutions
- Salesforce.com
- SaaS orchestration (Immediate)
- Application Life Cycle Services
- NextGen AM

Data

- Big Data & Analytics
- Case Management as a Service

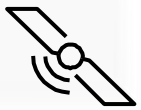
Infrastructure

Dynamic Services

- Infrastructure Transformation Services (ITS)
- Platform Delivery Services (PDS)
  - Multi-Sourced Services Integration (SI/SIAM)
  - Service Management
- Cloud Management Unit (CMU) – Platform & Brokering
- SkySight

Telecom

- Telecom Transformation



Consumer Products & Retail

- All-Channel Experience (CP&R)
- Demand Driven Supply Chain

Financial Services

- All-Channel Experience (FS)
- Claims and Policy transformation
- Risk Management
- Cards and Payment
- Core Banking

Public Sector

- Tax & Welfare Digital Processes
- Core Police Processes Modernization

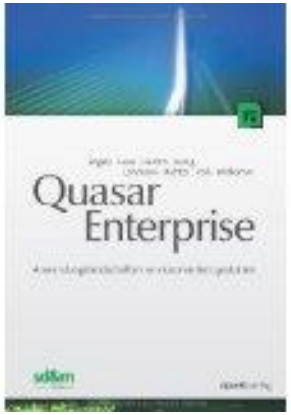
Utilities

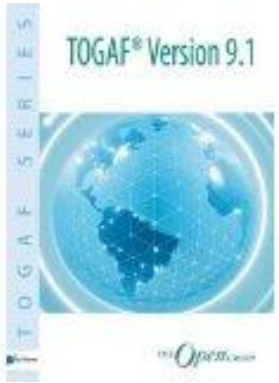
- Digital Utilities Transformation
- Smart Energy Services

Automotive

- Digital Customer Management
- Connected Car

Strong in Software Architecture





!?!?

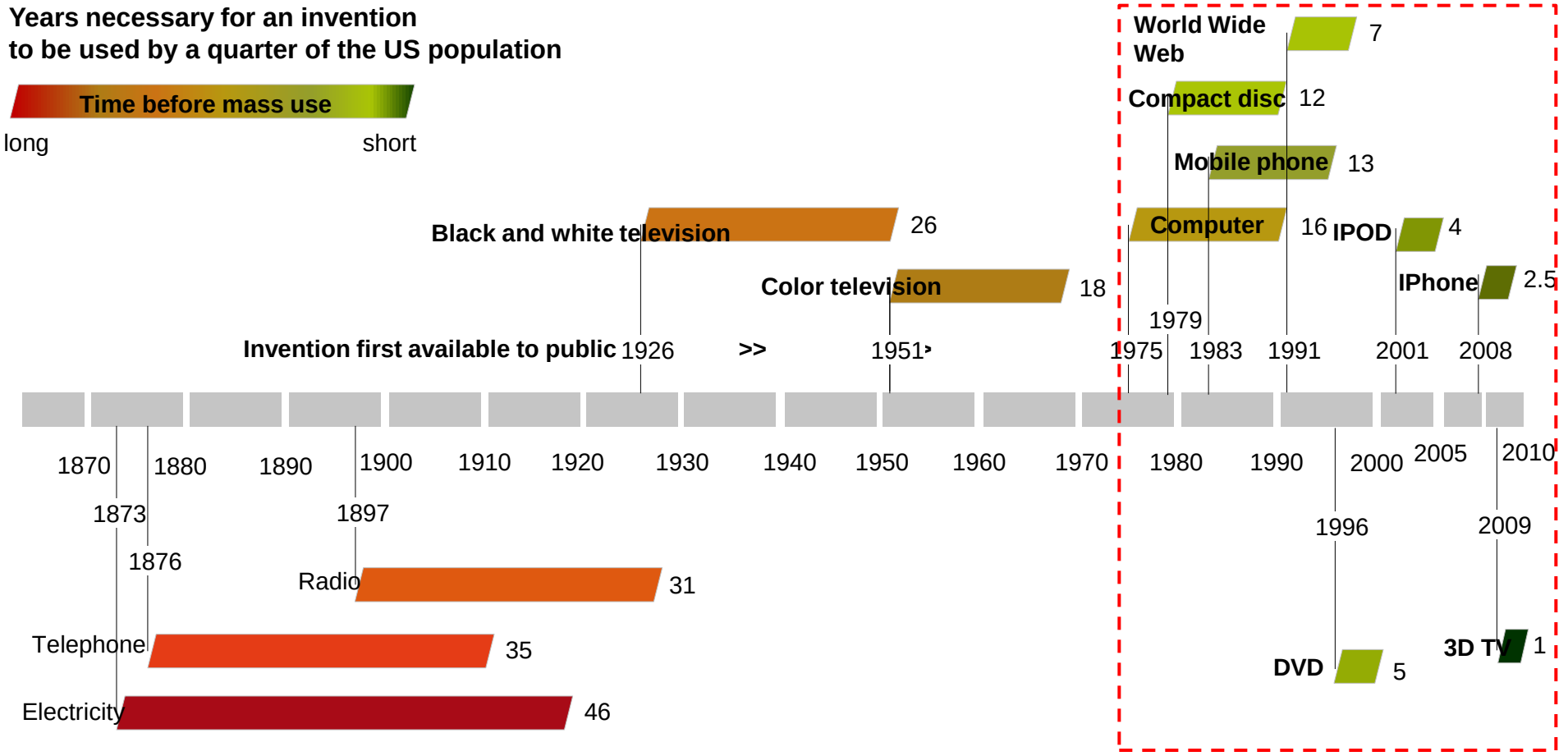
Agenda

- Digital Transformation
- TechnoVision – Design for Digital
- Digital Architecture
- Summary

Digital Transformation

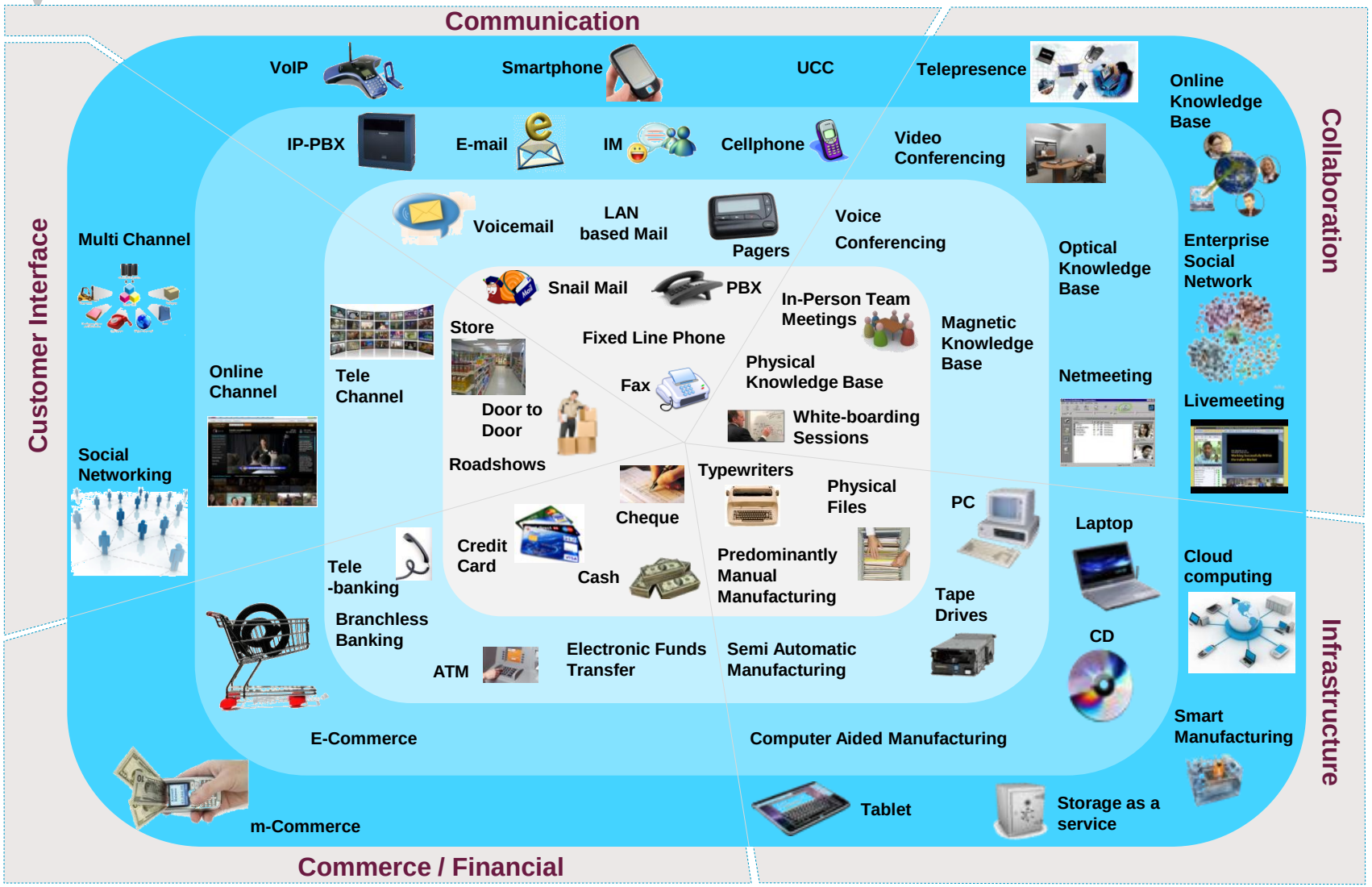
Digitization is now accelerating exponentially and driving unprecedented change in the economy

Faster entry of new products and technology adoption



Sources: Europa, Accelerating technological change: racing into the unknown", 2010, IDC, "2010 Digital Universe", 2010

Over the past decades, enterprises have progressively embraced digital tools

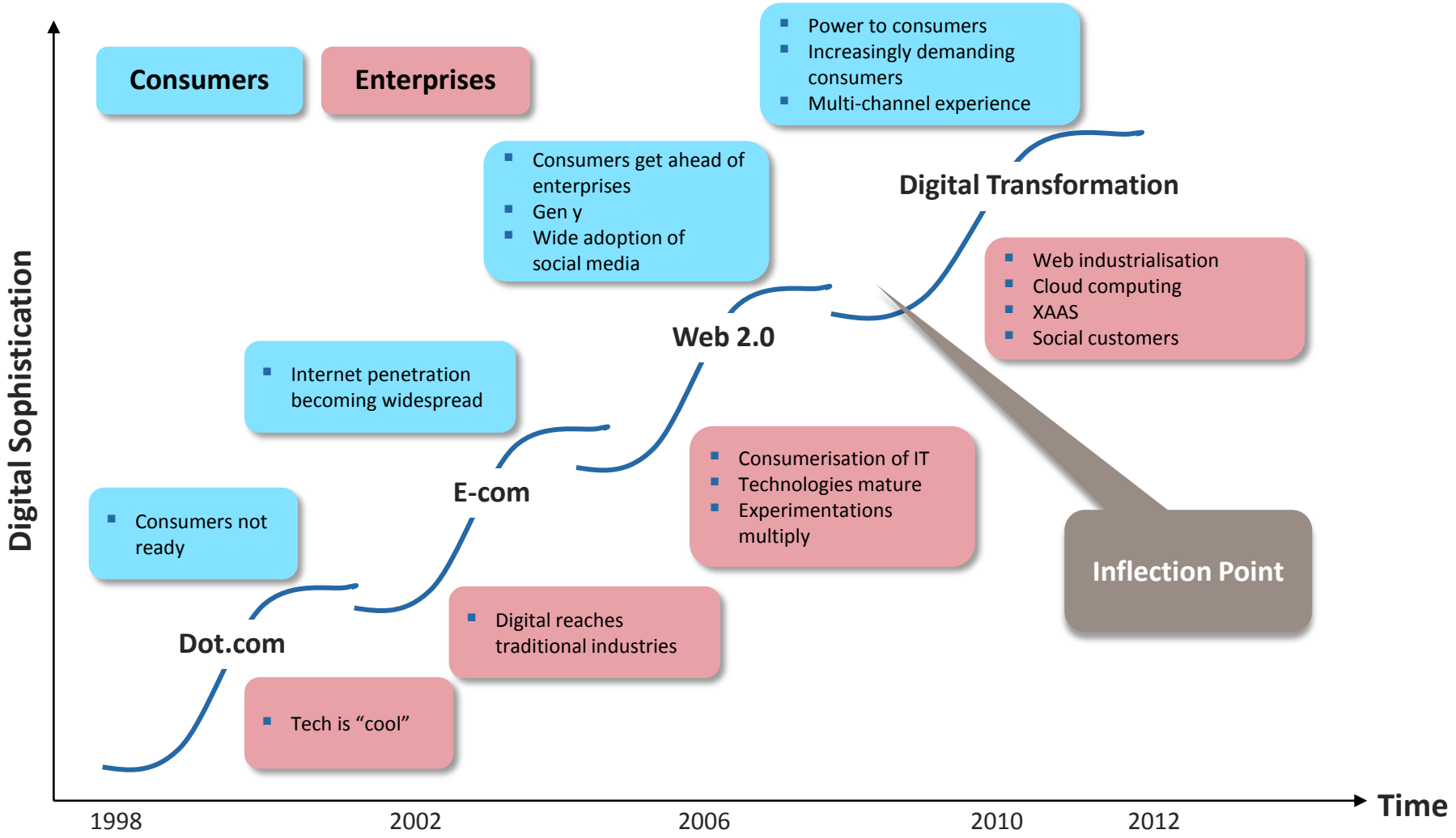


Key

- 1950-1970 Digital Early Days
- 70's & 80's Digital Progression
- The 90's Digital Acceleration
- 2000 Present Digital Transformation

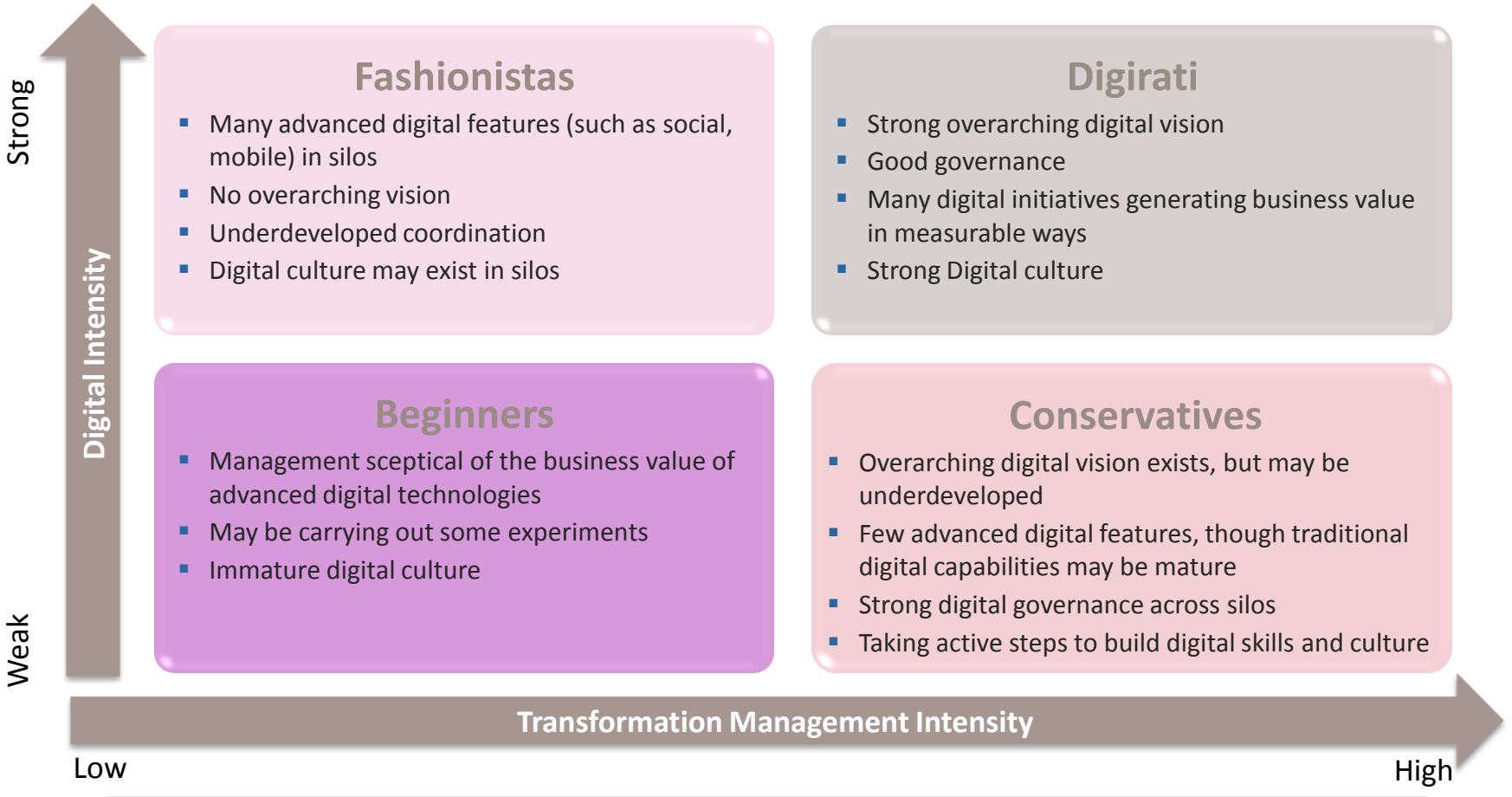
Sources: Capgemini Analysis

We believe that with both consumers and enterprises maturing on digital, we are at the cusp of a major changes



Organisations need to evaluate whether they have both transformation management intensity and digital intensity to succeed

Digital Maturity Model- Where do you stand?



The alchemy of success in Digital Transformation : Style and substance

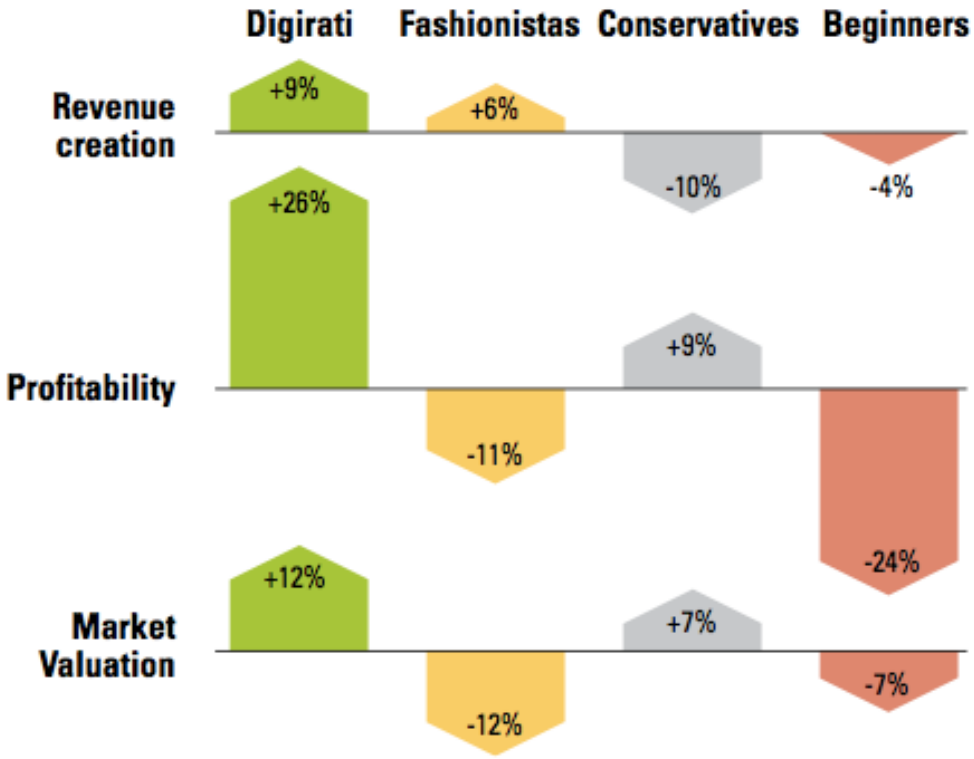
Sources: Capgemini Consulting-MIT Analysis

Source: Capgemini Consulting-MIT Analysis

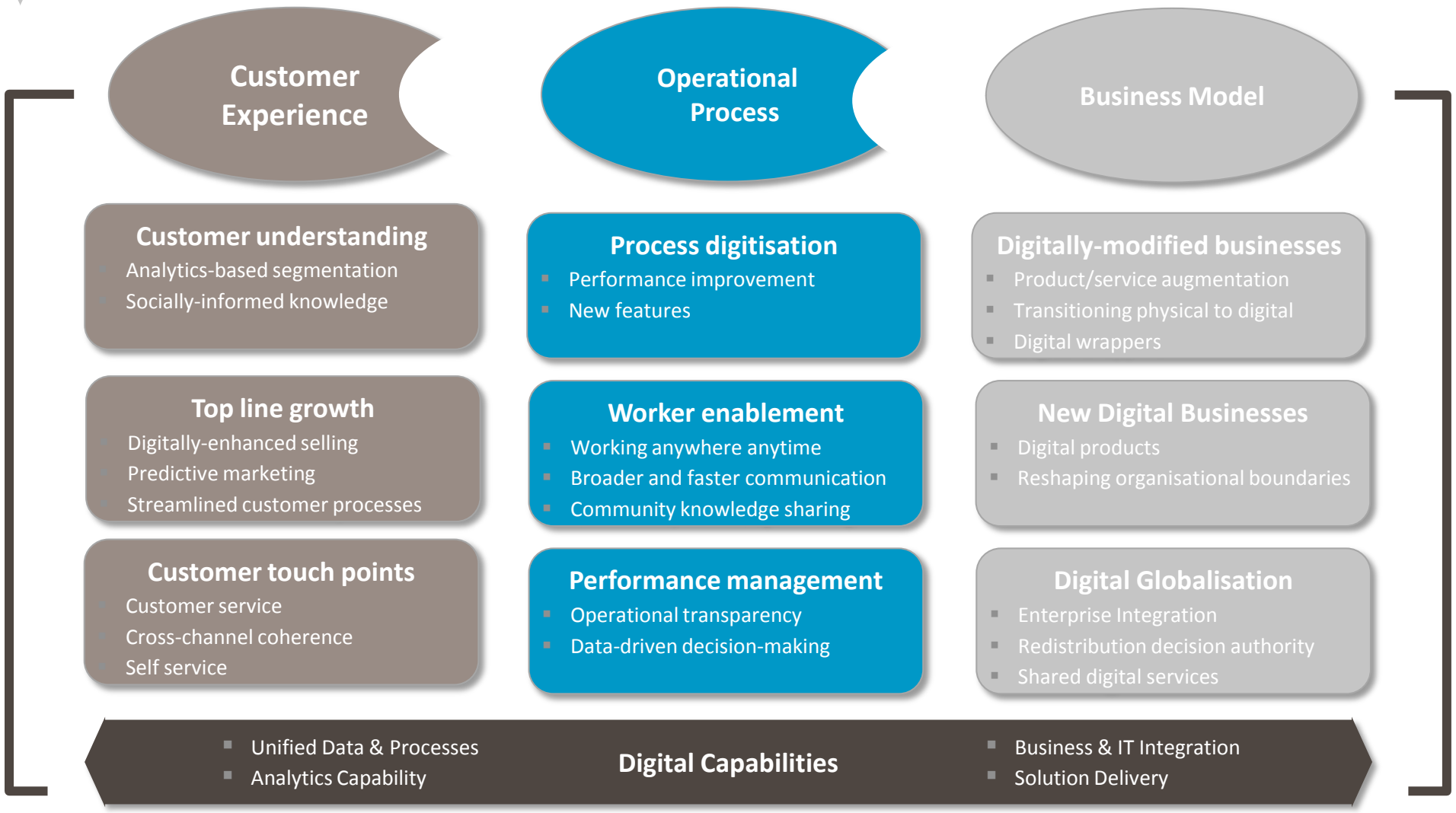
… the rewards …

DIGITAL CASH REGISTER

Digirati — the best companies at managing digital technology — get the best financial results.



Organisations are digitally transforming three key areas of their firm's value proposition: customer experience, operational processes, and business models



Sources: Capgemini Consulting-MIT Analysis

The Digital Transformation today is an important driver for the Design of IT Strategies

What *should IT contribute to Organisation development (→Effectivity)?*

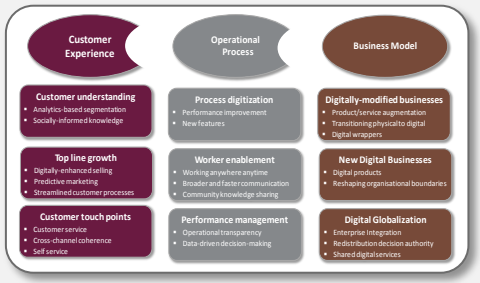
Technology Drivers

- Cloud
- Mobile Devices
- Big Data
- Social Media
- Internet of Things

Enterprise Srtategy

Transformative Digital Vision

Digital Governance
- Coordination
- KPIs



Digital Engagement
- Skills
- Multi-way Communication

Digital Capabilities

Targets of a State-of-the-art IT Design

- IT Strategy & Vision / Role of IT
- IT Application-Architecture
- IT Infrastructure
- IT Organisation
- IT Processes

Targets IT: sustainable & effective IT

How *should IT for the Organisation contribute to the targets (→Efficiency)?*

Agenda

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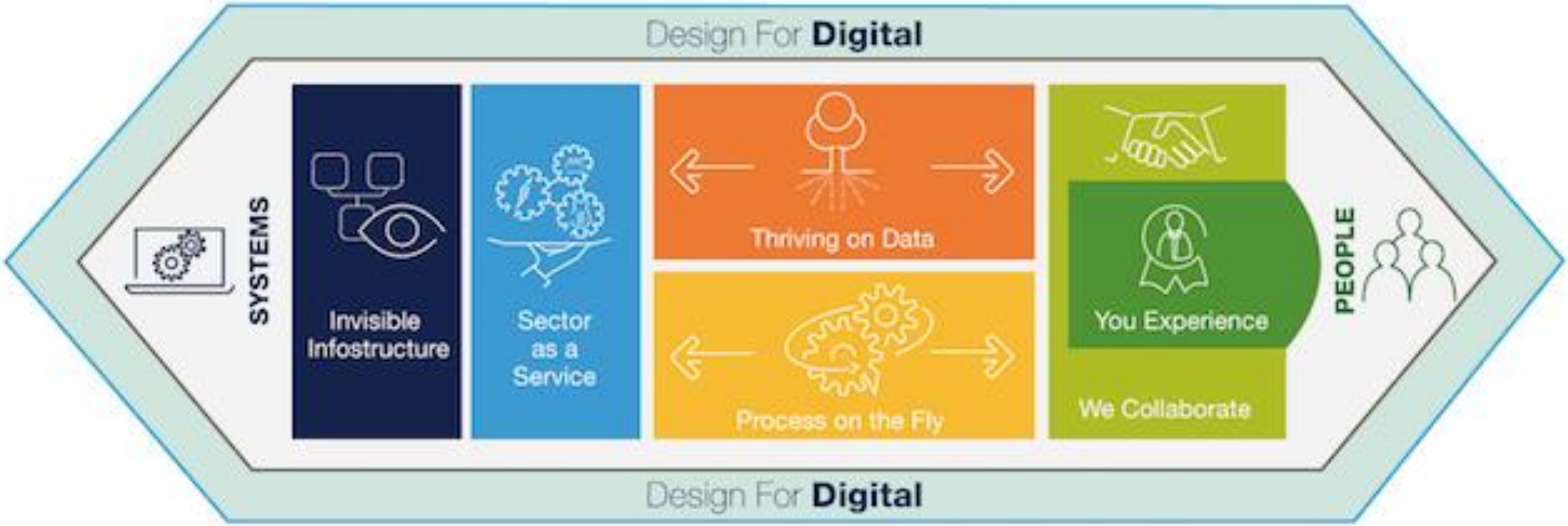
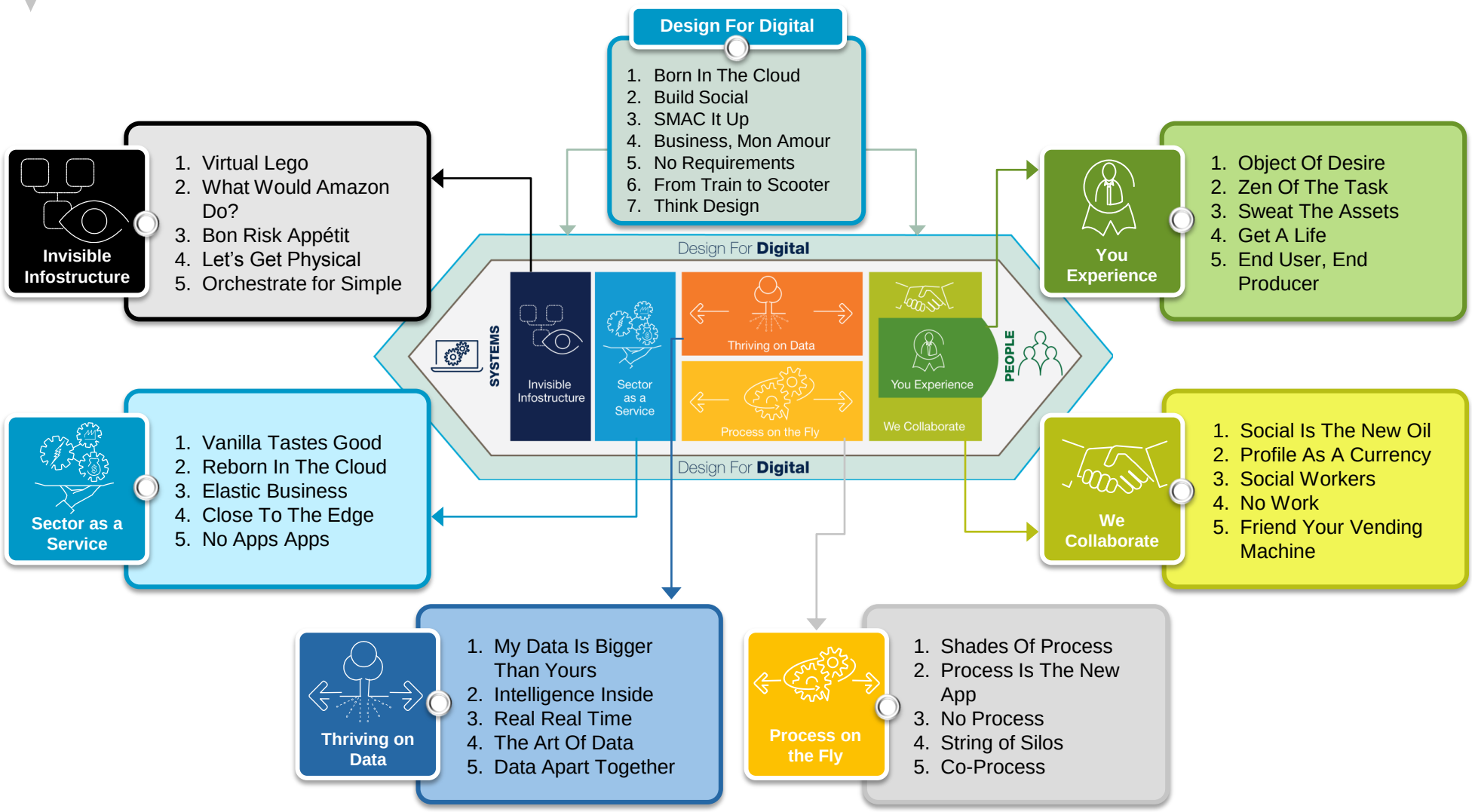
TechnoVision provides technology insights and building blocks …

http://www.capgemini.com/blog/cto-blog/2013/11/technovision-2014-an-introduction

.. positioned through an elegant framework …



. . . and illustrated through 30 perspectives and 7 Design Principles



Technology Trends – SMAC and beyond

Using the Cloud for applications renewal

Design For Digital

1. **Born In The Cloud**
2. Build Social
3. SMAC It Up
4. Business, Mon Amour
5. No Requirements
6. From Train to Scooter
7. Think Design

Once organizations have implemented or built their first cloud applications, they will find they have a powerful cloud platform available that comes with these applications. They can now consider leveraging more of that platform, not only to create additional solutions but also to renew the existing applications landscape. This may be a matter of simply ‘cloud-enabling’ legacy applications by providing them with a new front-end and integrate them with the cloud applications. But applications can be completely ‘reborn’ too, taking full advantage of living in the cloud.

It’s all in the combination of technology drivers

Design For Digital

1. Born In The Cloud
2. Build Social
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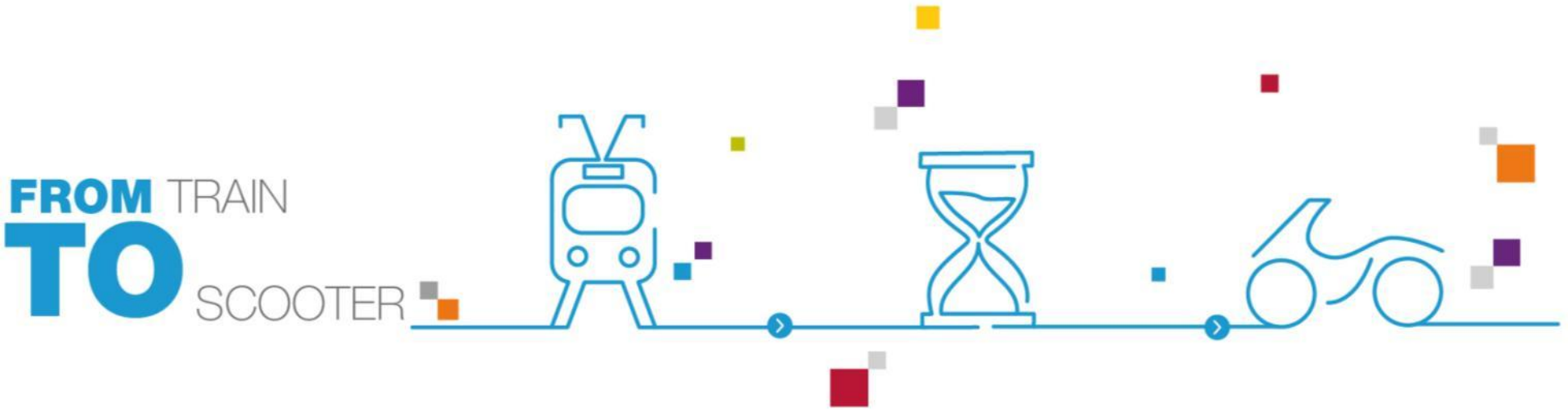
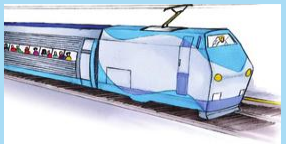
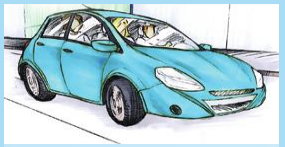
Although the drivers of Social, Mobile, Analytics (or ‘Big Data’) and Cloud all have powerful transformation impact themselves, the real breakthroughs are created by **bringing them all together**. In this powerful melting pot, the drivers amplify each other, creating something much more compelling than the sum of the parts. So whenever you consider a solution in one of these areas, systematically look in the other areas as a default for synergetic inspiration.

A new solutions development rhythm evolves

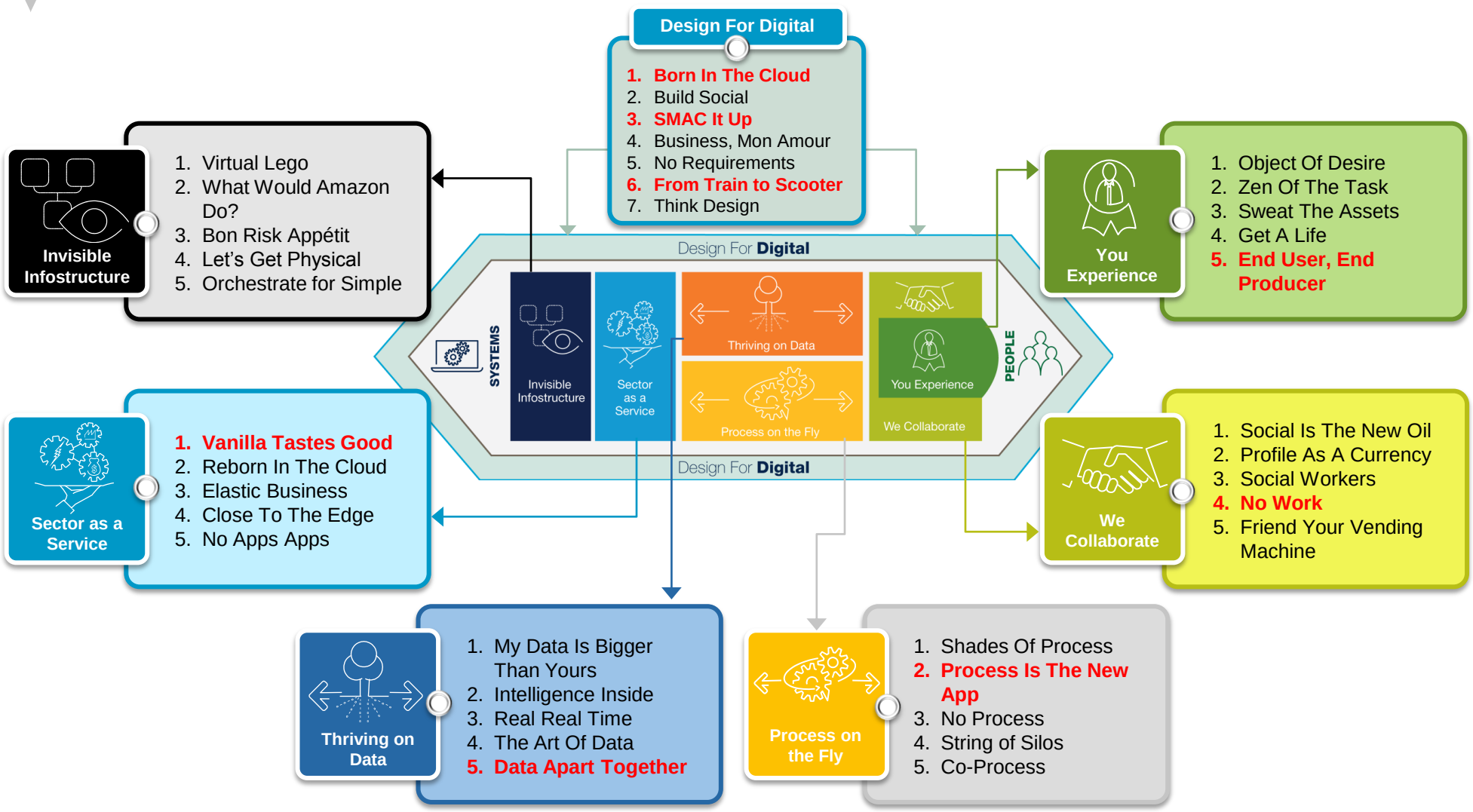


The next generation of Business Technology solutions has a short time to market, is created and delivered in an agile way and is developed and owned in the nearest proximity of the business. These solutions are much like Scooters and Cars, where the current applications landscape typically is populated with Trains and Buses. **Think about when to apply the right rhythm**, build the 'hub' platforms to support and start to explore new, flexible ways to build solutions, applying agile approaches such as SCRUM and rapid development tools.

…rhythms and life cycles driving & following the business evolution…

LIFECYCLE	 TRAIN	 BUS	 HUB	 CAR	 SCOOTER
RHYTHM	YEAR	SEASON	MONTH	WEEK	DAY
APPLICATION AREAS	ERP, Legacy core apps	CRM, HCM, SCM, Procurement	Data market, Apps store, Mobile platform, API catalog	BPM, BI, ECM, Mobile, Apps	Rules, Portal, Collaboration site, active forms
GOVERNANCE	Central IT, outsourced, requirements	IT & Business, value scenarios	Central IT, platform-driven	Business, IT-enabled	Business / personal
ARCHITECTURE	Stability, predictability, robustness	Agility, model-driven, vanilla	Open, patterns, standards, service-oriented	Ease of use, flexible, model-driven	Self-service, configurable
TESTING	Formal, regression	Value / Use Case-driven	Industry Strength	Built-in, exploratory, integration	No harm, legal testing
DELIVERY	Linear, offshore	Agile, off /onshore, SaaS	Agile, project-by-project	Agile, model-driven, visual	Ad-hoc, visual, configuration
KEY CAPABILITIES	AM, reqs mgmt, rationalization	Scrum, template-driven	SOA, Cloud, integration	Business analysis, orchestration	End-user tools

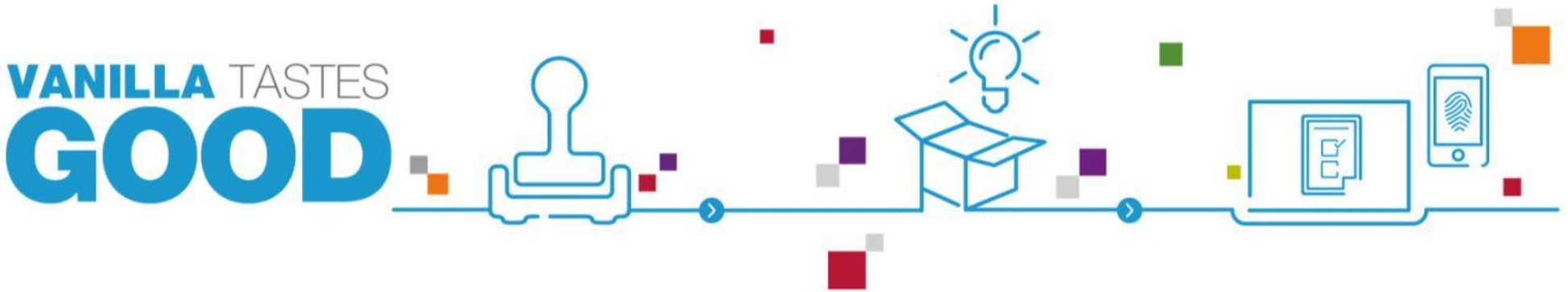
. . . and illustrated through 30 perspectives and 7 Design Principles . .



The (SaaS) applications catalogue is the default starting point …

Sector as a Service

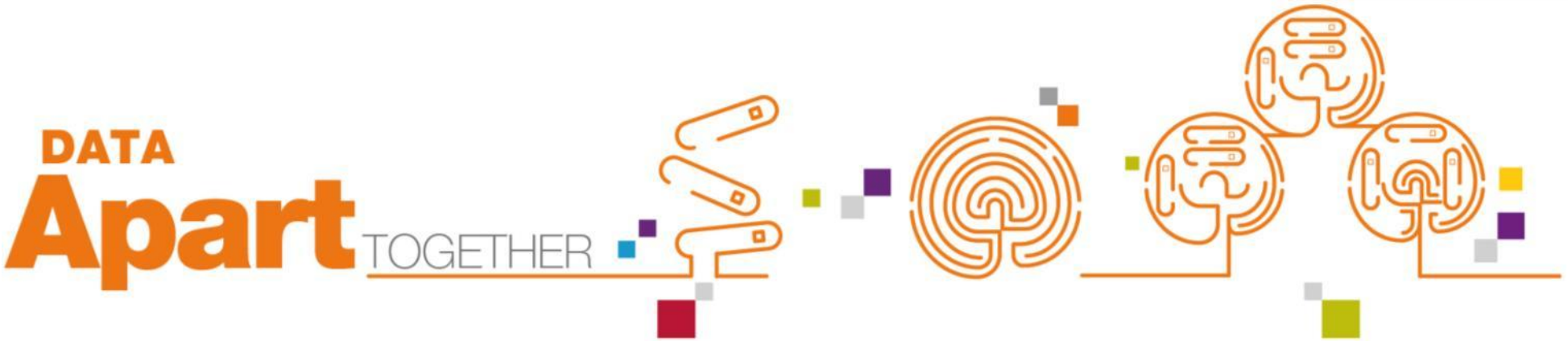
1. **Vanilla Tastes Good**
2. Reborn In The Cloud
3. Elastic Business
4. Close To The Edge
5. No Apps Apps



Many core applications – both custom built and package based – used to have a differentiating value to the business. Now they are often consuming the bulk of available IT budget due to excessive maintenance costs, while the differentiating 'edge' is already found elsewhere, in other solutions around mobile, social, BPM and Big Data. **Time to drastically move to good old 'vanilla,' using out-of-the-box, non-customized versions of standard (cloud-based) software** or by step-by-step rationalization of homegrown applications to leaner, simpler versions that are easier and less costly to maintain.

Balancing the realities of central and de-central data

1. My Data Is Bigger Than Yours
2. Intelligence Inside
3. Real Real Time
4. The Art Of Data
5. **Data Apart Together**



To succeed digitally means being able to leverage information across disparate organizational units in a consistent way. In this definitely federated world of information, **it is the strength of the links between services that determines how genuinely digital an organization is**. Governing these core pieces of master data helps the business remain in control in a more and more distributed, loosely networked context. New tools and technologies can help keep this master data managed, but it's the business governance of information as a corporate asset that really creates the unified view of organizations that are working apart together.

Separating process from code

1. Shades Of Process
2. **Process Is The New App**
3. No Process
4. String of Silos
5. Co-Process

The next generation of **business process management and business rules management tools is so powerful that it actually can be seen as the successor to custom-built applications**. Being able to define detailed process, flows, decision trees and business helps on both the business and IT side to create powerful, differentiating solutions that would have required extensive custom coding in the past. Now much of the definition can be done ‘on the fly,’ using visual models and (semi) natural language in the nearest proximity to the business.

Growing The API Economy

Centrally gathering all requirements, compiling them into a list of mobile initiatives and then building the apps - one by one - does no justice to the development potential of the crowd, nor does it provide a short time-to-market. **Focus on building a 'hub' platform instead: a catalog of enterprise-level services and APIs to catapult new apps, built by yourself and others, both inside and outside the company, by individuals, business units or external partners**. Then focus on mobilizing, enabling and supporting your end producers; they will create the greatest mobile apps in return.

Crowdsourcing the organization

1. Social Is The New Oil
2. Profile As A Currency
3. Social Workers
4. **No Work**
5. Friend Your Vending Machine

Providing customer support is hard work. However, customer support doesn't always have to be provided by the company itself. A few years ago outsourcing was a trend, preferably to a country with lower costs so it was easier to deal with peak situations. After that, insourcing became a trend since customer loyalty retention and satisfaction were deemed more important. Now **it's time for the logical step of 'un-sourcing,' which leverages the power of social networks and media: Don't do it yourself.** Initiate peer support - customers helping customers and customers helping you.

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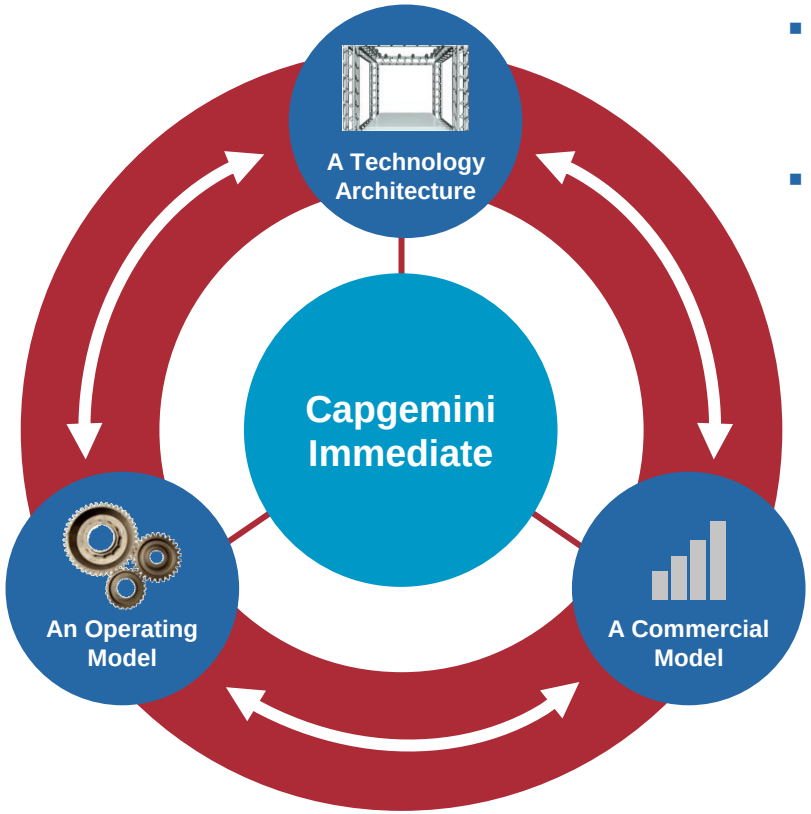
Immediate is our framework for managing an ecosystem of services

Governance & Operation

- Best of breed vendors managed in an integrated service framework
- Plug and play in line with business need
- Managed service delivered to agreed SLA's
- Operating model covers incident management, service enhancement, application migration, user experience etc



Technology

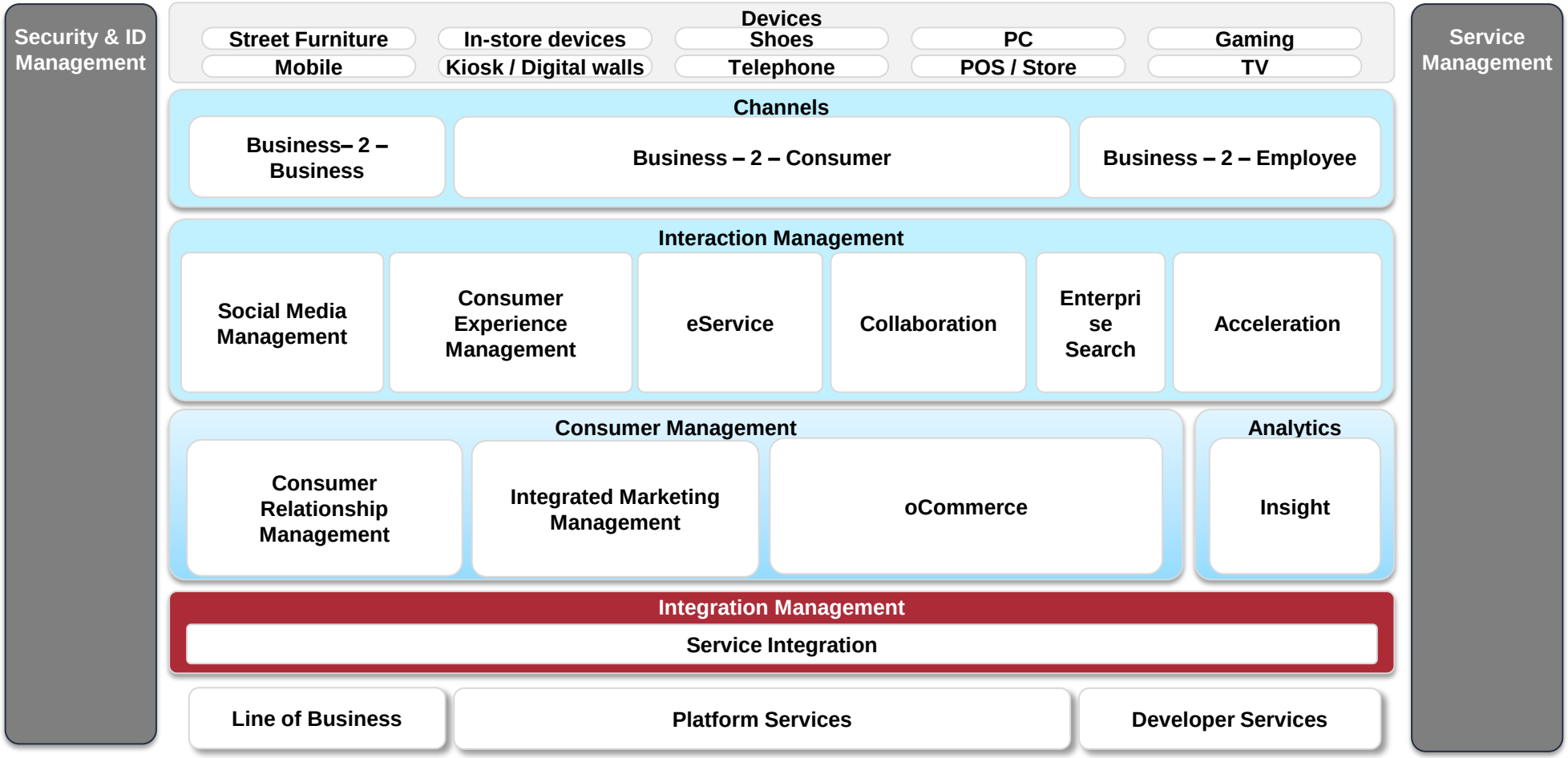
- Connects new world social and web channels to existing back office investments
- Re-usable framework for customer identity, integration and service management

Commercial Model

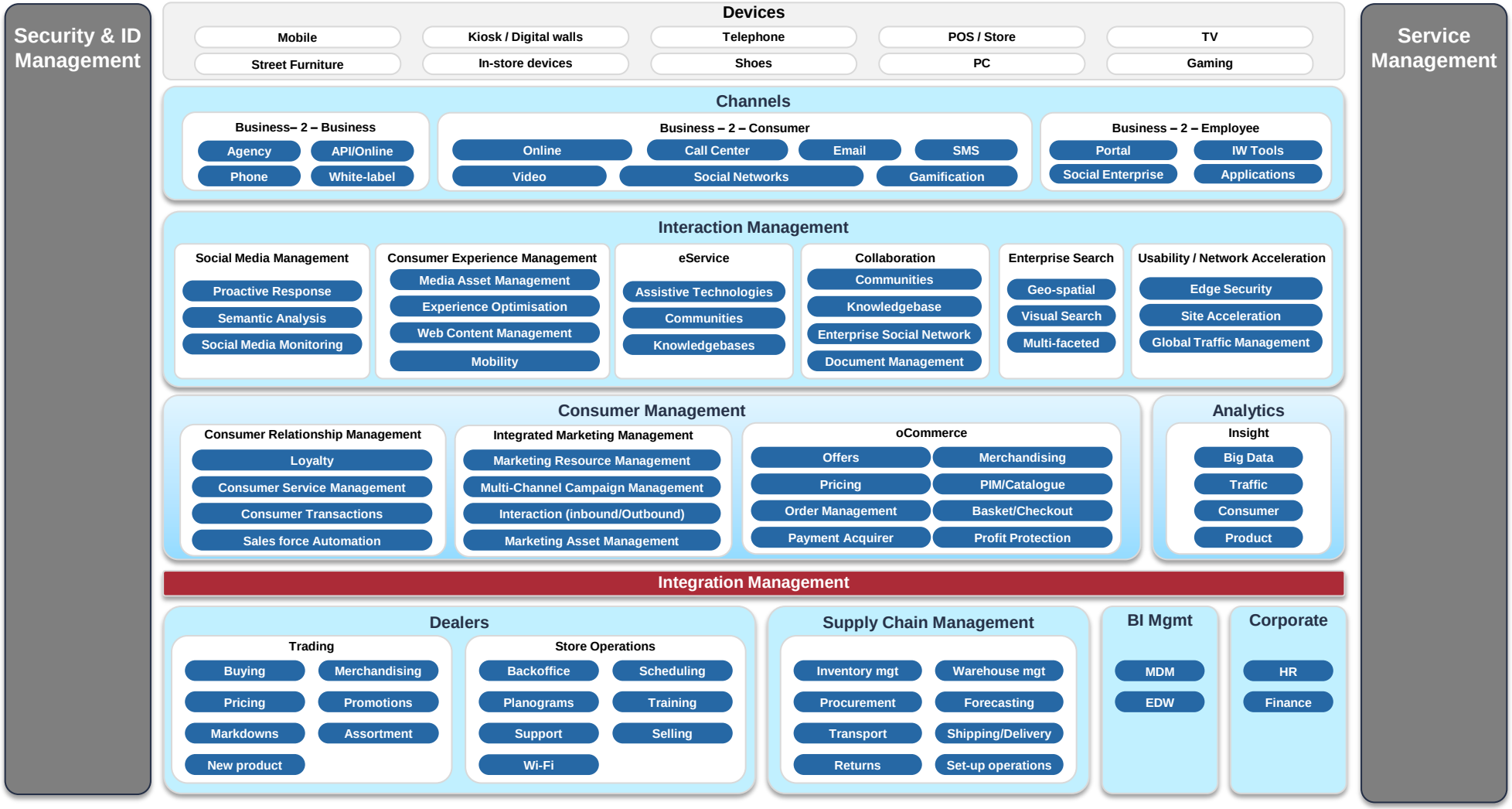
- Utility pricing aligned to business outcomes
- Pay as you go to reduce upfront investment

This framework allows us to orchestrate loosely coupled, best of breed services across cloud (SaaS) and on premise whilst retaining and single view of the customer

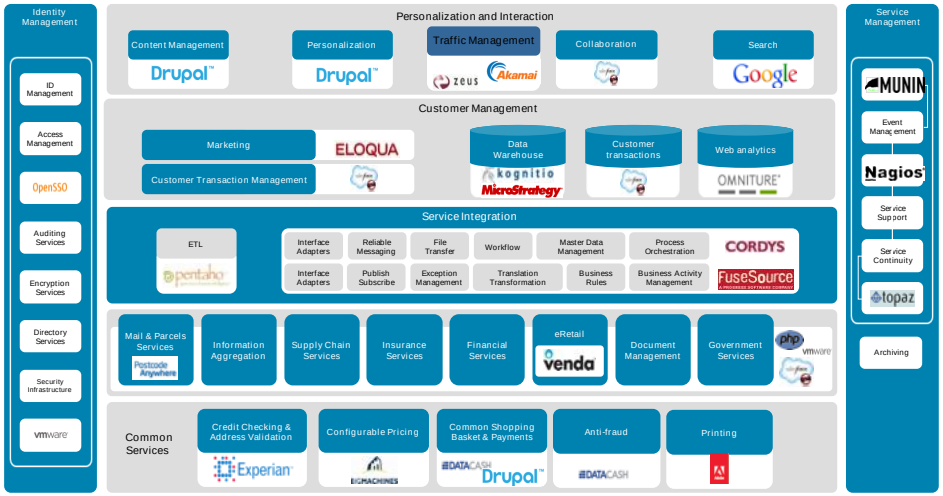
The core of our Capgemini Immediate IP sits around our ‘H’ model

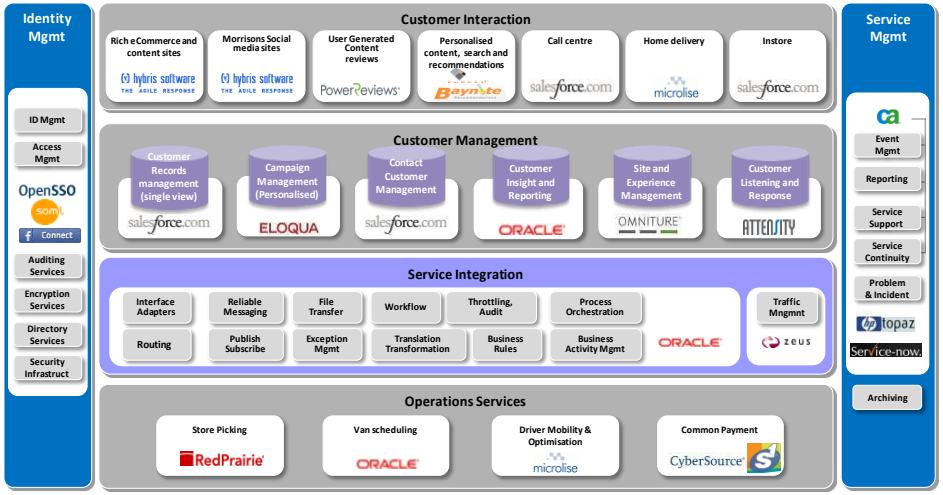


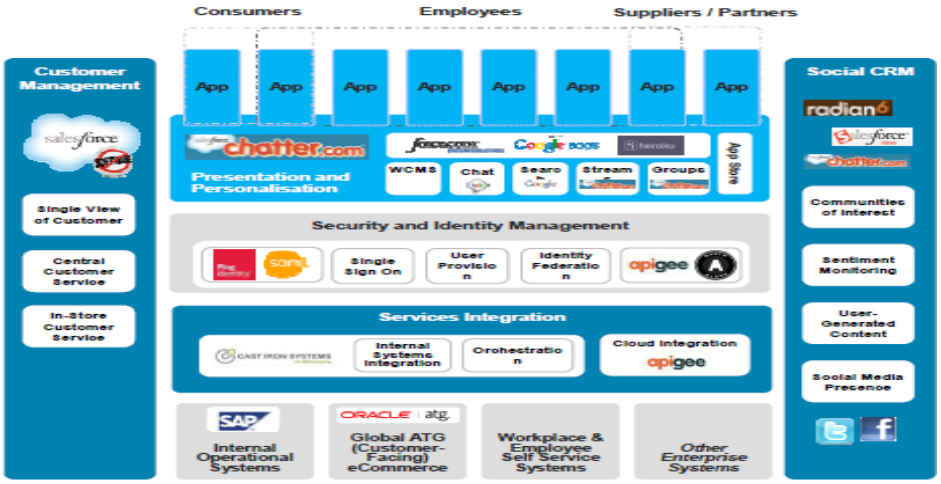
We have developed reference frameworks by sector – e.g. Retail



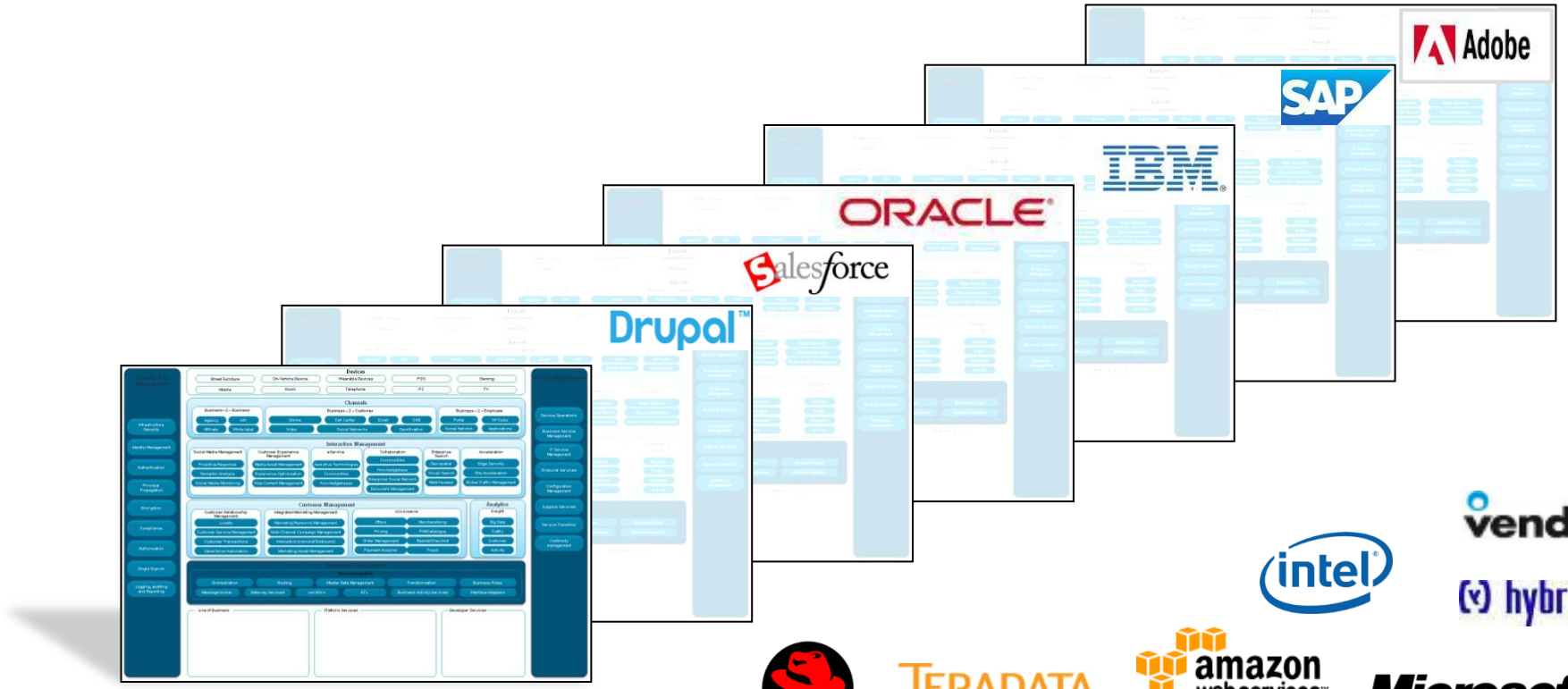
We work with our clients incumbent partners where appropriate







We are continuously evolving our partner ecosystem



Our repository of re-usable patterns and components is available to accelerate delivery

We can make available this Capgemini IP for helping our clients accelerate their speed to value and reduce delivery risk

This is How We are Doing It

Architecture documents inform the delivery of the platform upon which the eBusiness solution is delivered

Architecture

ARCHITECTURE DOCUMENTS
Architecture documents inform and guide the platform. Additionally parts of the architecture help guide design and development teams

Platform

PLATFORM DESIGN AND DELIVERY
The platform is designed with guidance from the architecture. The platform provides the basis on which the business applications are deployed and also provides the interaction with the wider eco-system

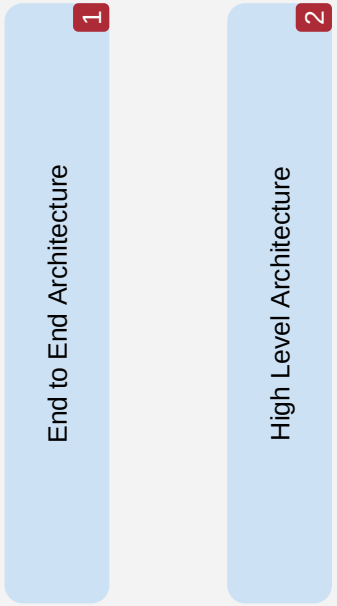
Design and Development

APPLICATION DELIVERY
Applications and content are designed and delivered on a per release basis utilising the services delivered by the platform

Release and Govern

DEPLOYMENT AND SUPPORT
Following testing, applications and content are released into production and are transitioned into operational support

We will document the architecture to provide a complete representation of the eBusiness solution



THE 'WHAT' AND THE 'HOW'
The conceptual and logical architecture, across the eBusiness solution, will be described in consistent terms to provide direction and control

- Applications Architecture 3
- Information & Reporting Architecture 4
- Infrastructure & Network Architecture 5
- Security & Registration Architecture 6
- Integration Architecture 7
- eCommerce Architecture 8
- Presentation & UI Architecture 9
- Service Management Architecture 10

WITH WHAT?
The solution architecture, by domain, describes the physical components we will use and defines how they should be deployed and configured

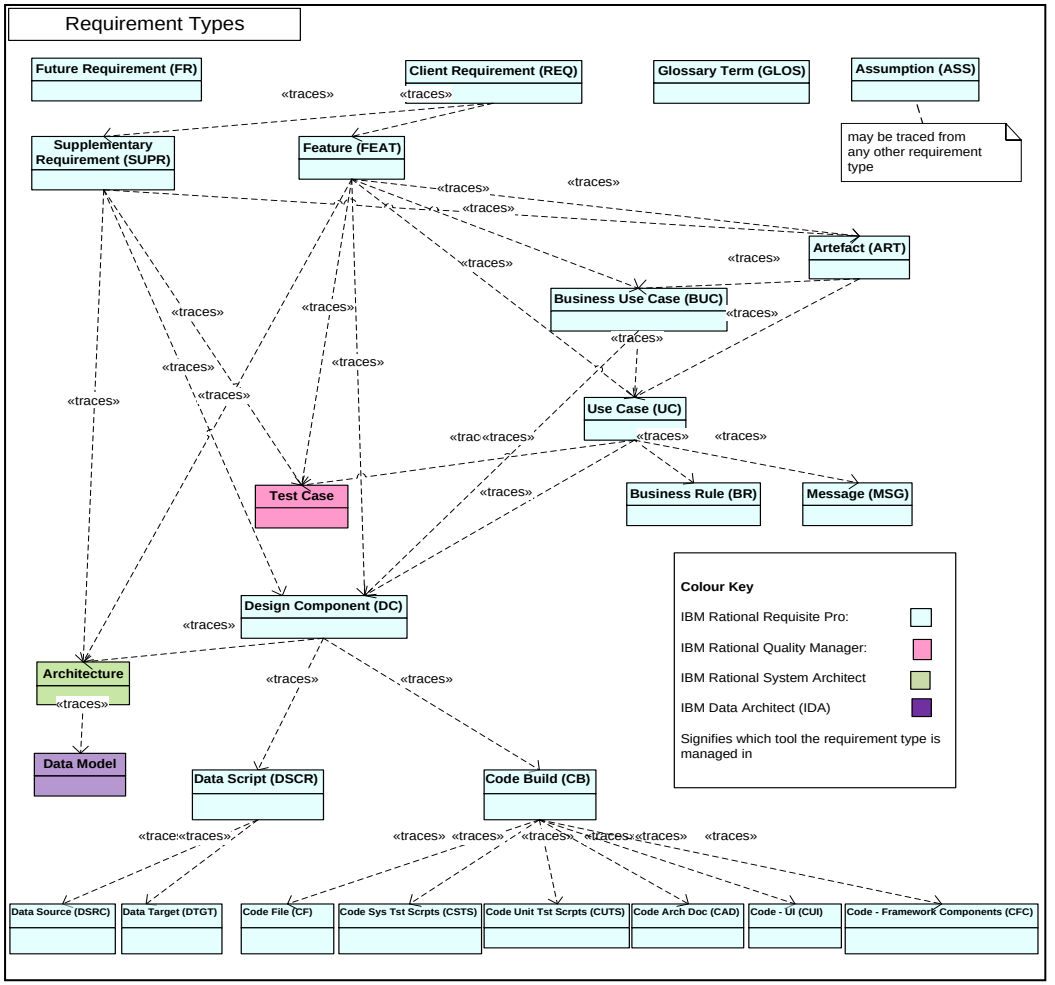
- Bus. App. Architectures and Tech Solution Docs
- BASS Designs
- Component Architectures
- Application Data Specifications
- Func I/F Specs, Tech I/F Specs, Service Specs
- TASS Architectures
- CMS Style guides, Themes, Admin
- Network connectivity, Configs, Support Guides

REALISED HOW?
The designs for each Client business application, together with supporting components, is defined in design documents

Document references identify the specific documents which are described in a catalogue and associated through a map

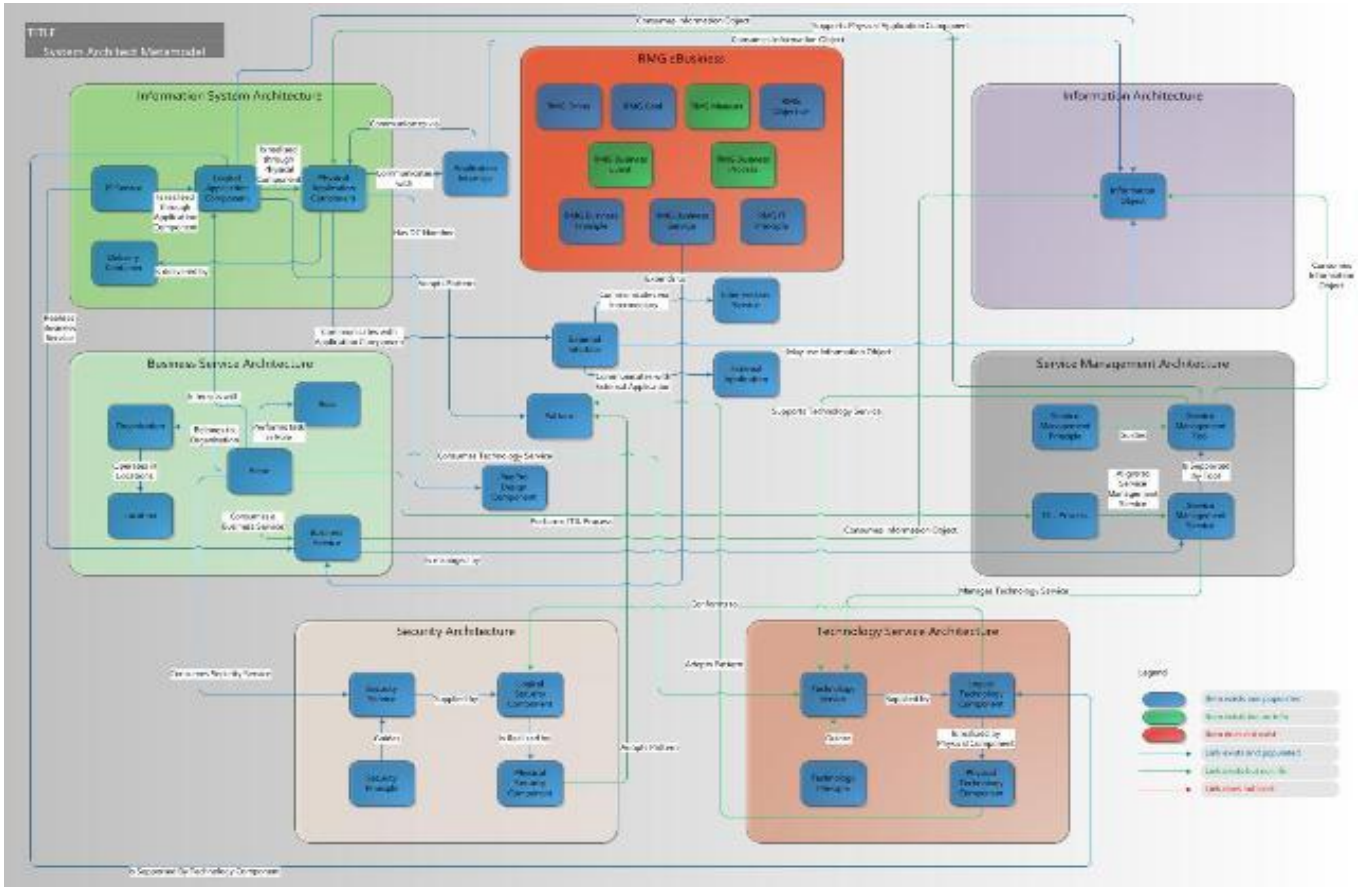
A key benefit of architecture is traceability. We are using the Rational Toolset to track traceability from Requirements

- Clients functional requirements enable us to define features
- Features, together with operational characteristics, are described in artefacts
- Use cases flex features and place them in context whilst allowing rules and information flows to be defined
- A use case gives rise to a test case
- From use cases, components can be defined the design for which is governed by architecture
- Architecture must be able to encompass all the foreseen features and the architecture must be fit for purpose as identified though the non-functional requirements
- Components are realised through application code (unless SaaS / package solutions can be found) which is then governed

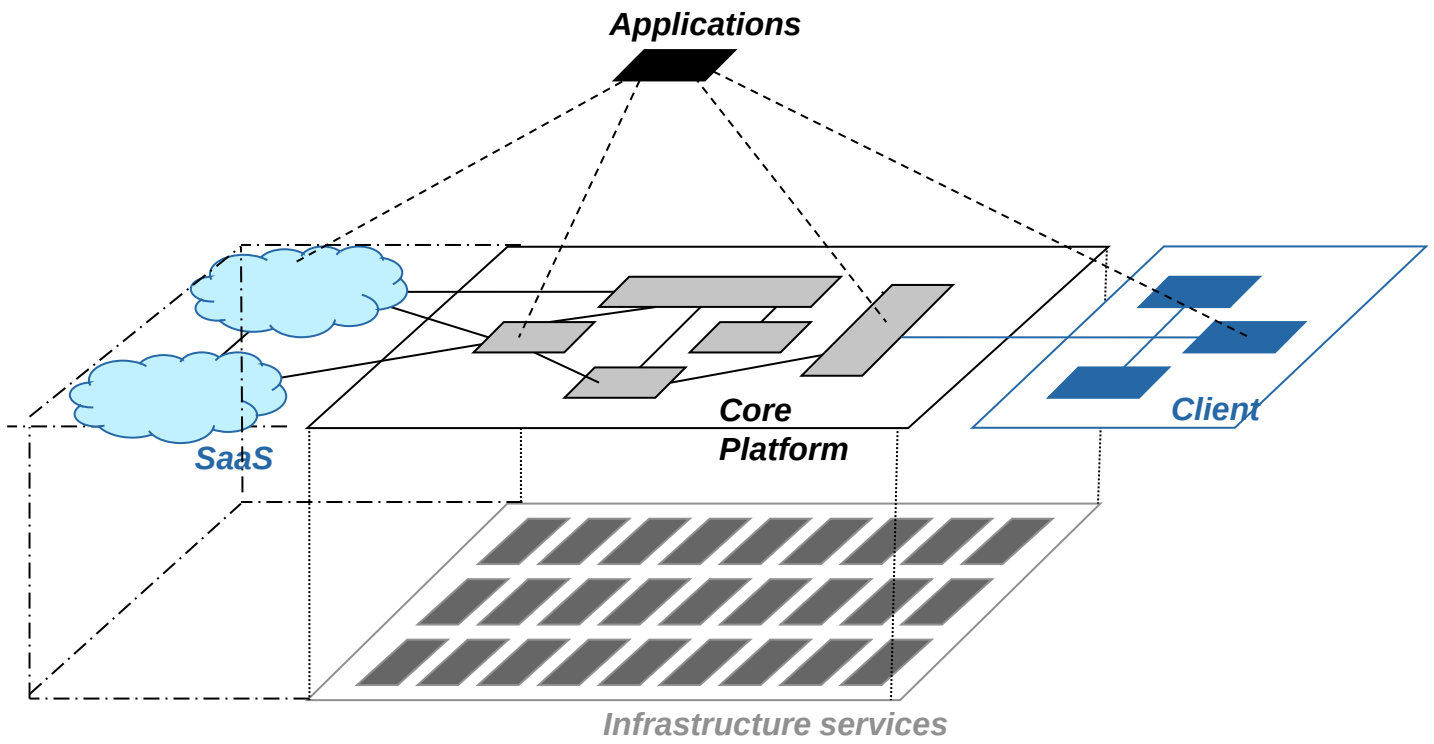


Complimentary to requirements management and traceability is the governance of the architecture through System Architect

- System architect is used to capture architecture information
- Both catalogues and matrices are easily held in SA
- Conceptual services as well as logical and physical components are recorded in SA
- The structure of SA has been largely influenced by the relationship of our domains and artefacts
- Diagrams and documents are managed through collaboration tools



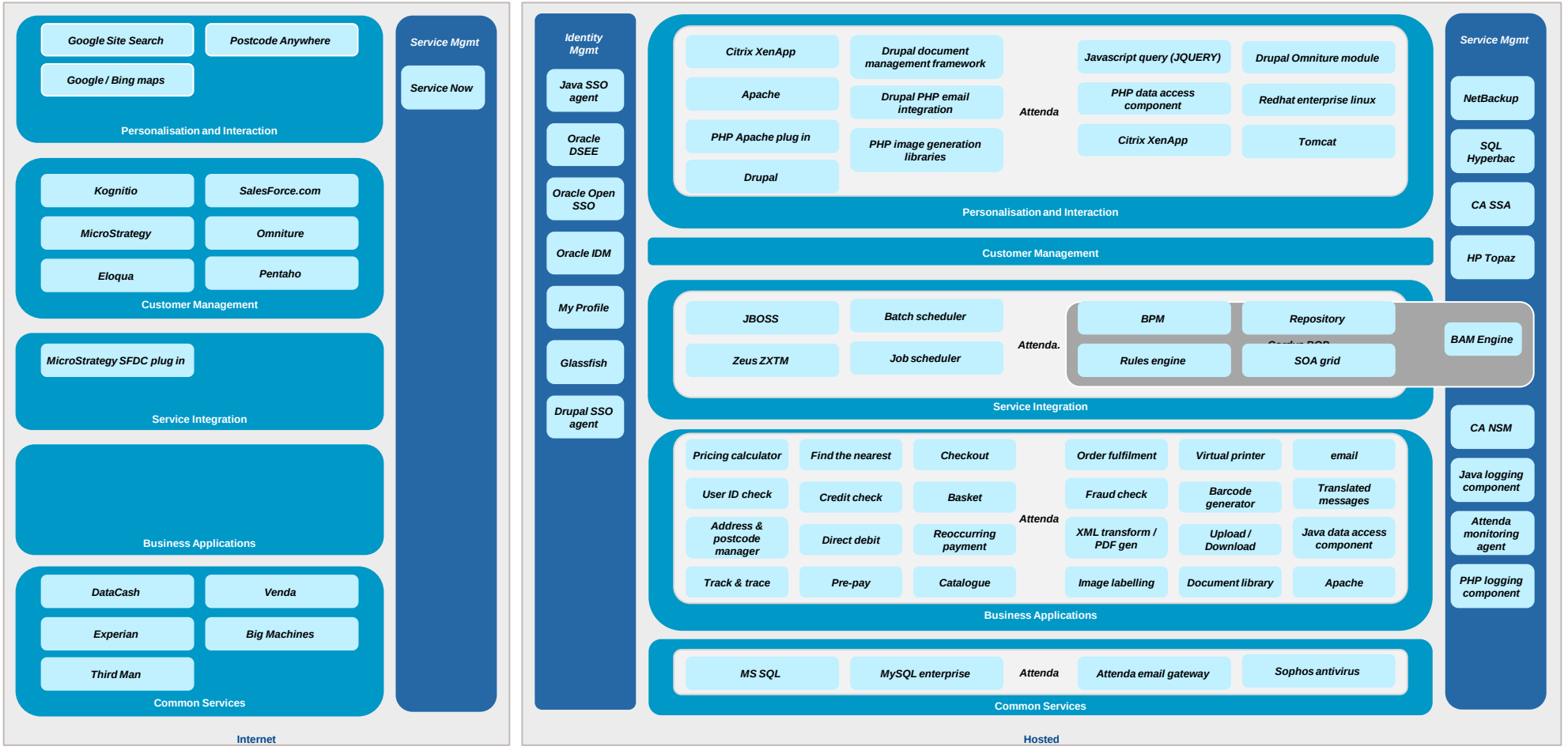
We will create an architecture for the platform – Immediate – and then build applications per release upon this



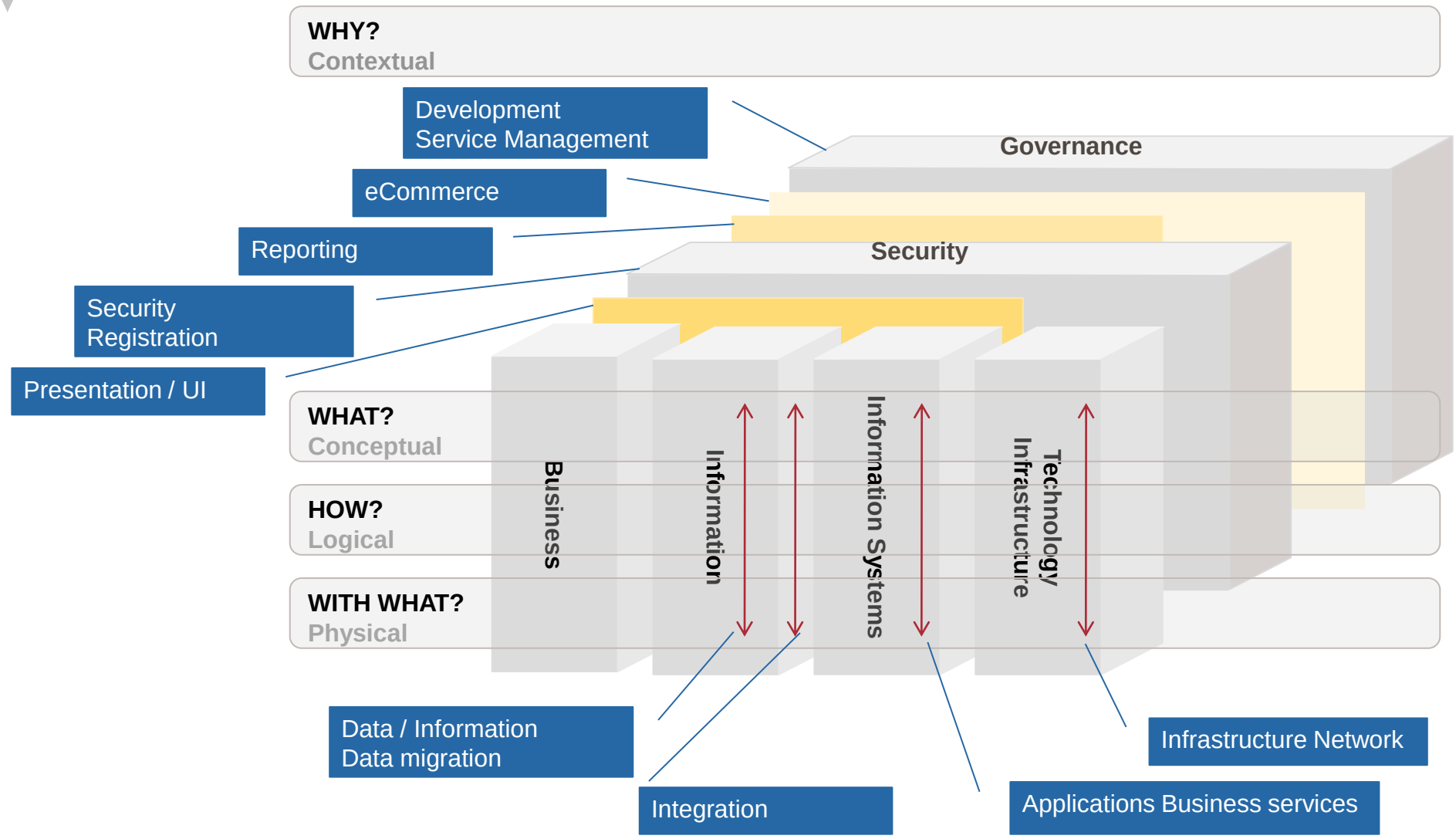
A bespoke (aka. specific for Client) application takes different "services" provided by the platform, together with Client and SaaS services, and "wires" them together to form new functionality

The Immediate platform covers hosted and SaaS components

All software platform components are shown that directly support the delivery of Client applications (purely 'infrastructure' software is not shown)



The different viewpoints of the eBusiness architecture all fit within the Capgemini architecture framework model



Integration Architecture

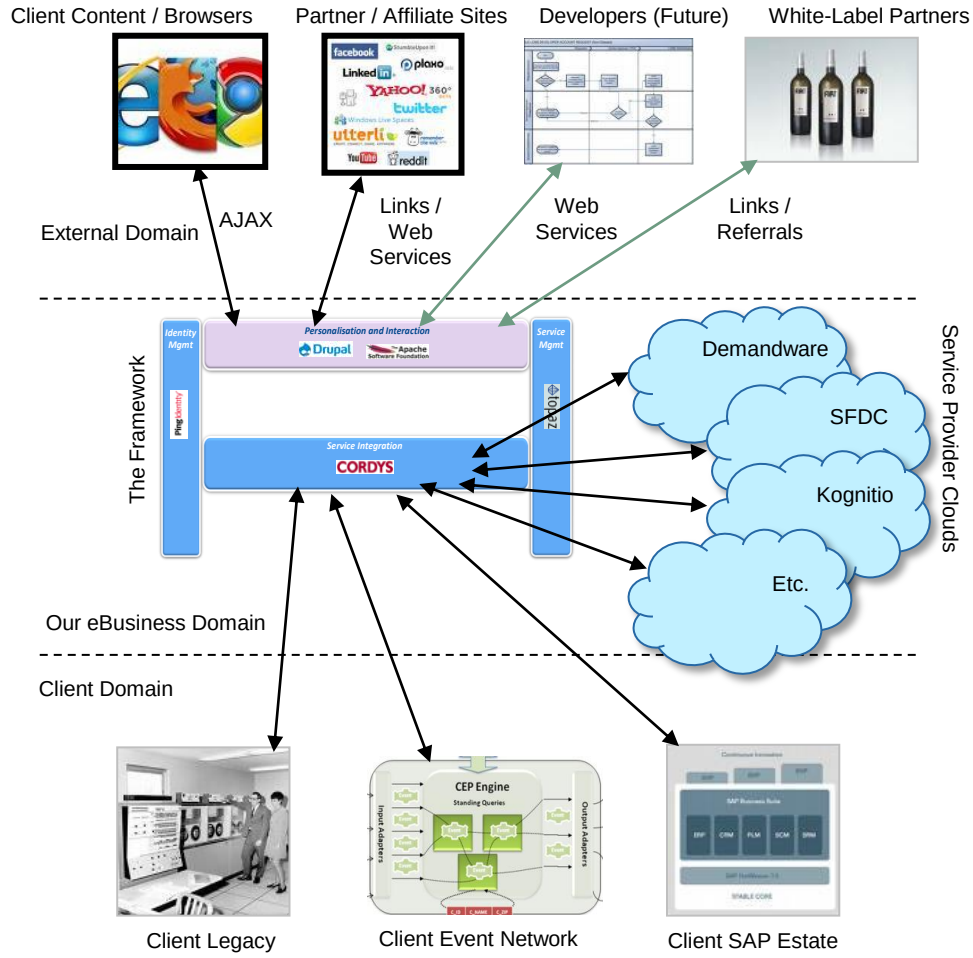
Three Different Domains of Integration

The nature of the integration is quite different between the three groups

- The External Domain
  - General web services
  - From the browser, affiliates, even web developers / partners

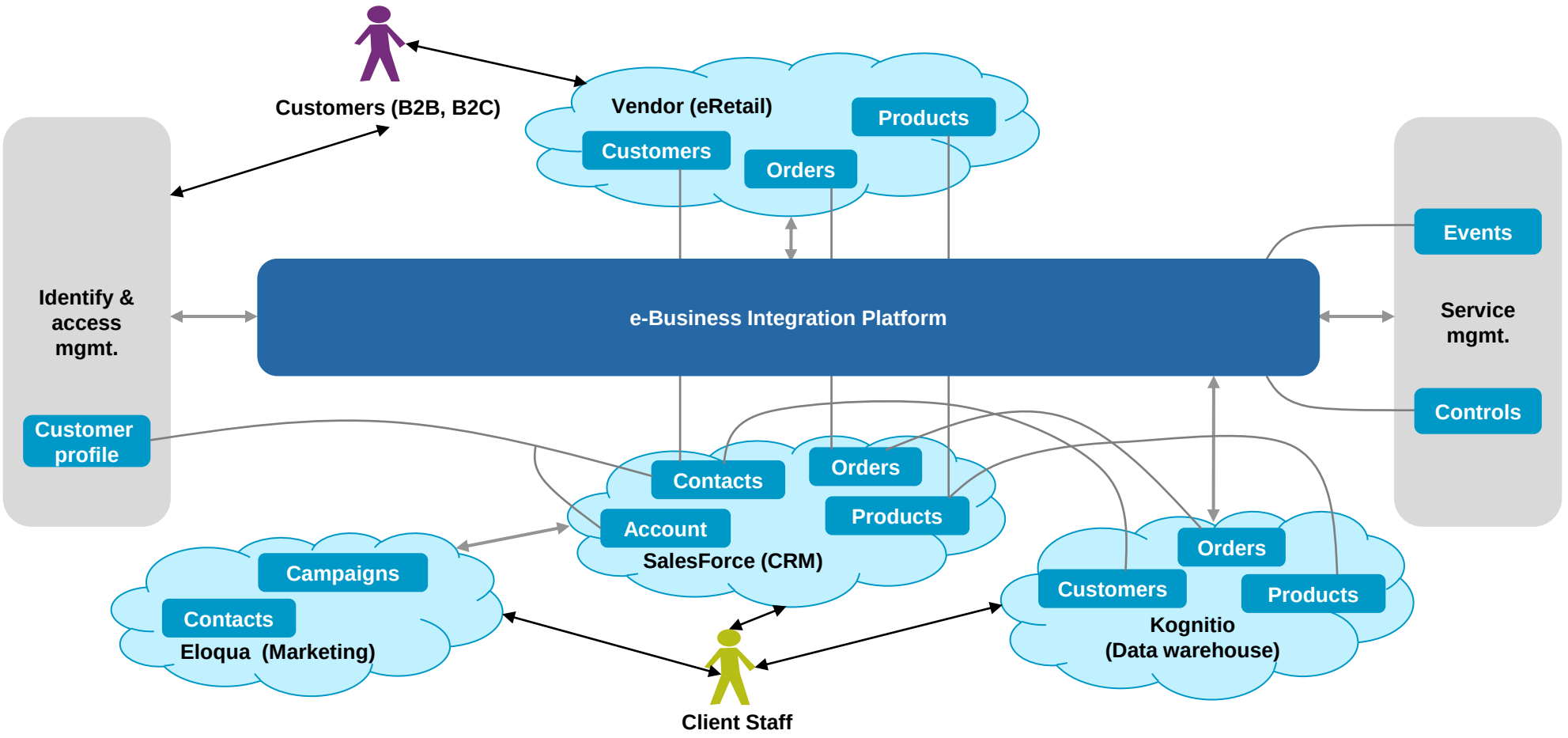
- The eBusiness Domain
  - Integration needed for our solution to function
  - IPR to be retained by Capgemini

- The Client Domain
  - CSC-supported systems
  - Via Client's integration platforms
  - Particular need for throttling, strong audit & monitoring



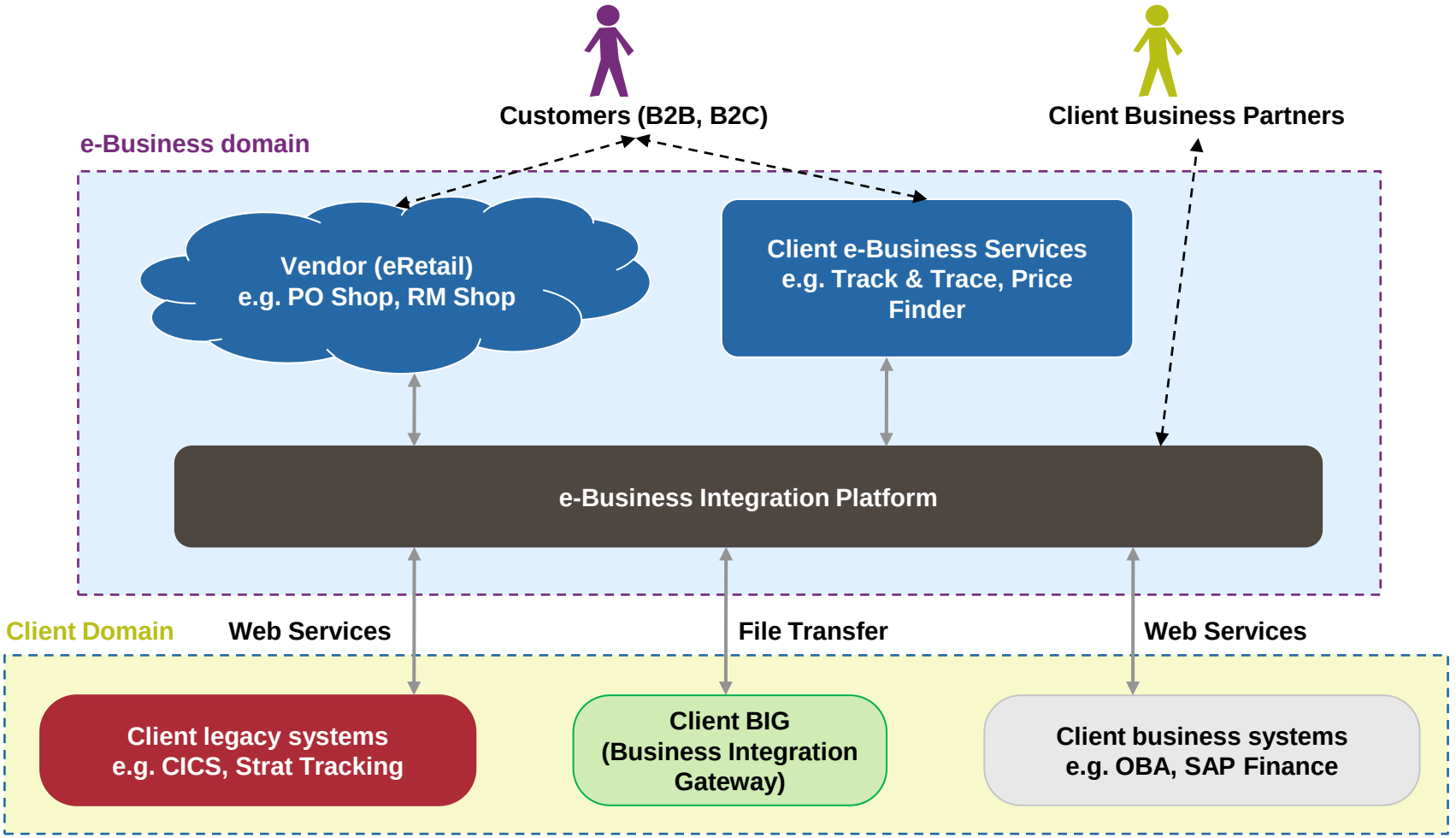
The eBusiness Domain

Integration between internal eBusiness components

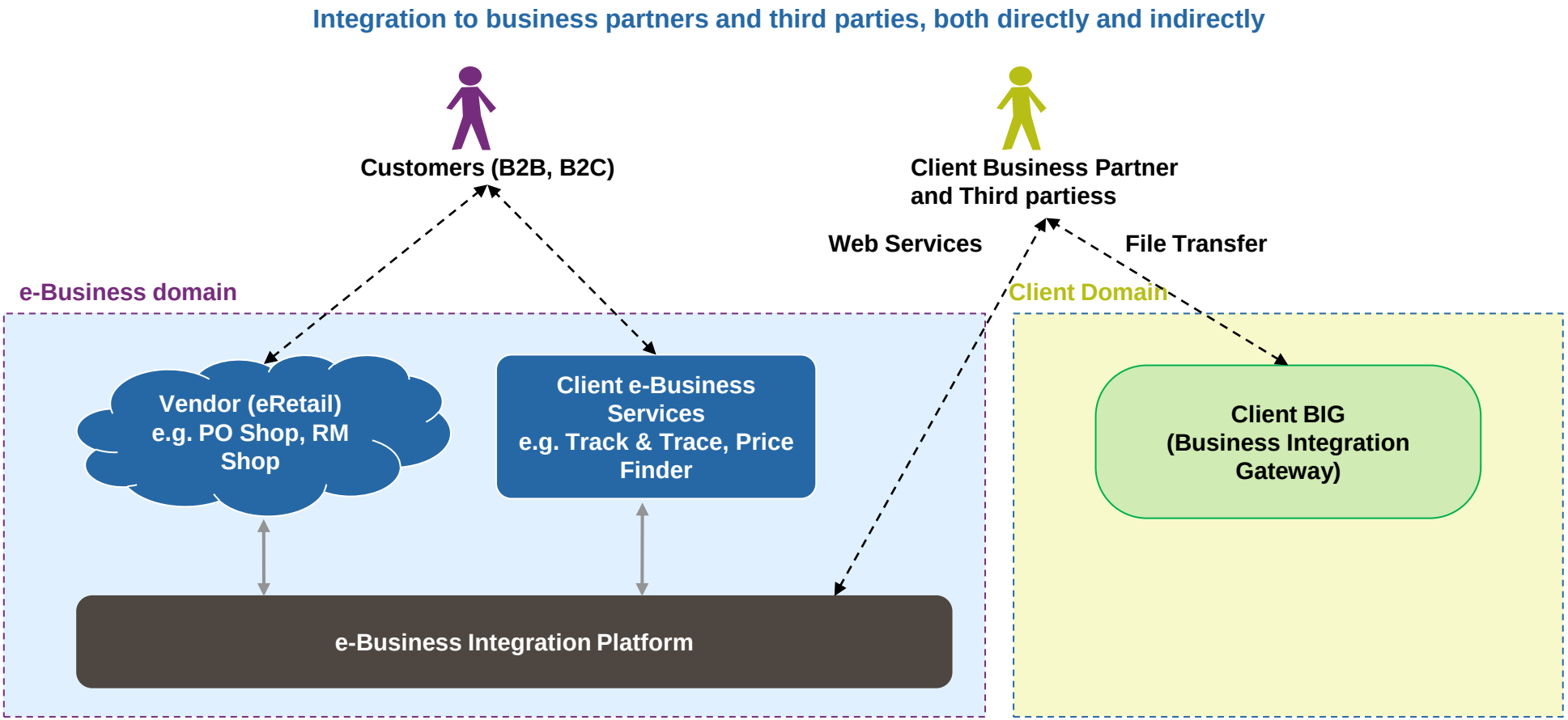


The Client Domain

Integration with Client Enterprise information systems (driven by eBusiness)

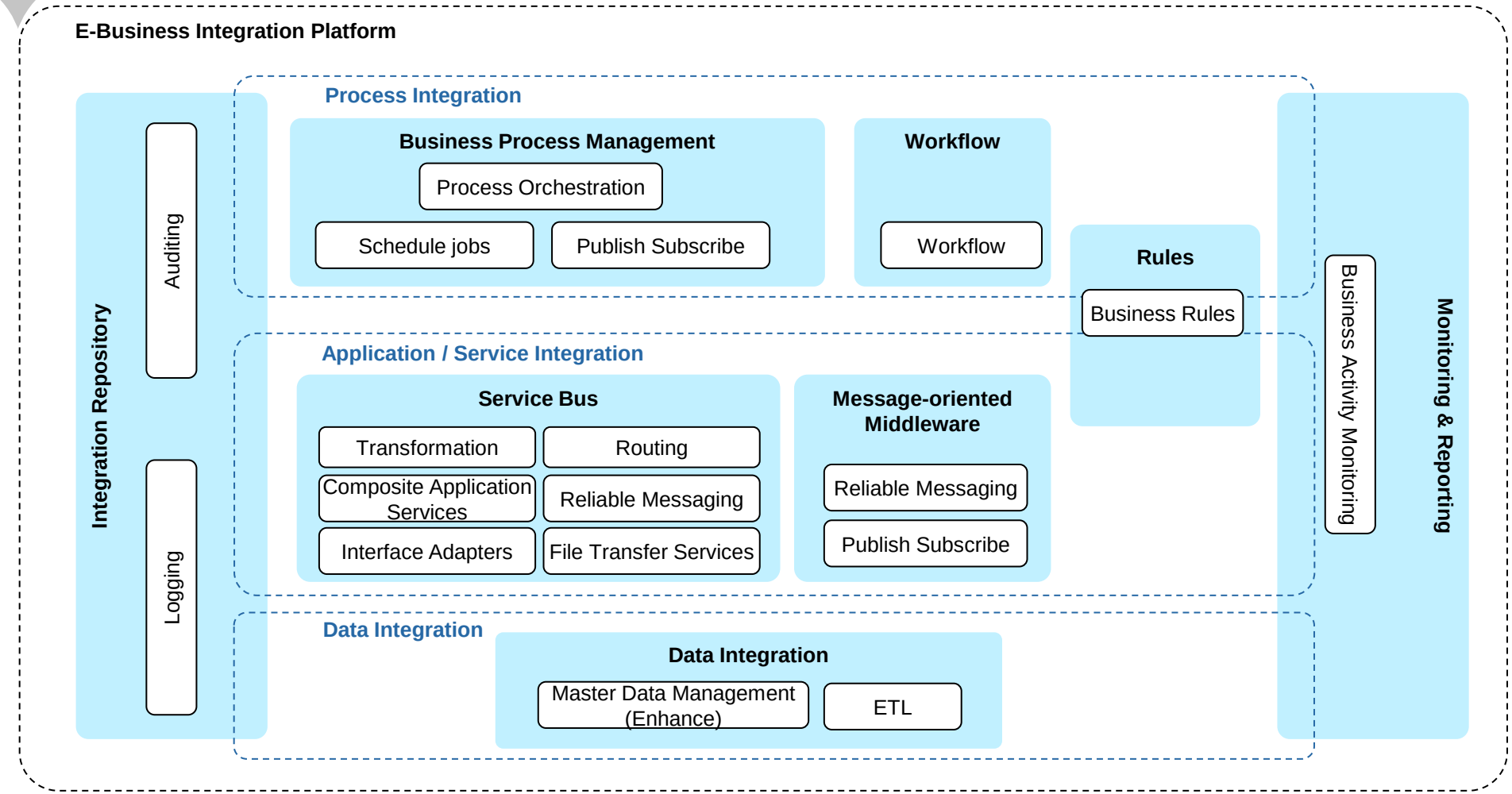


Third party integration



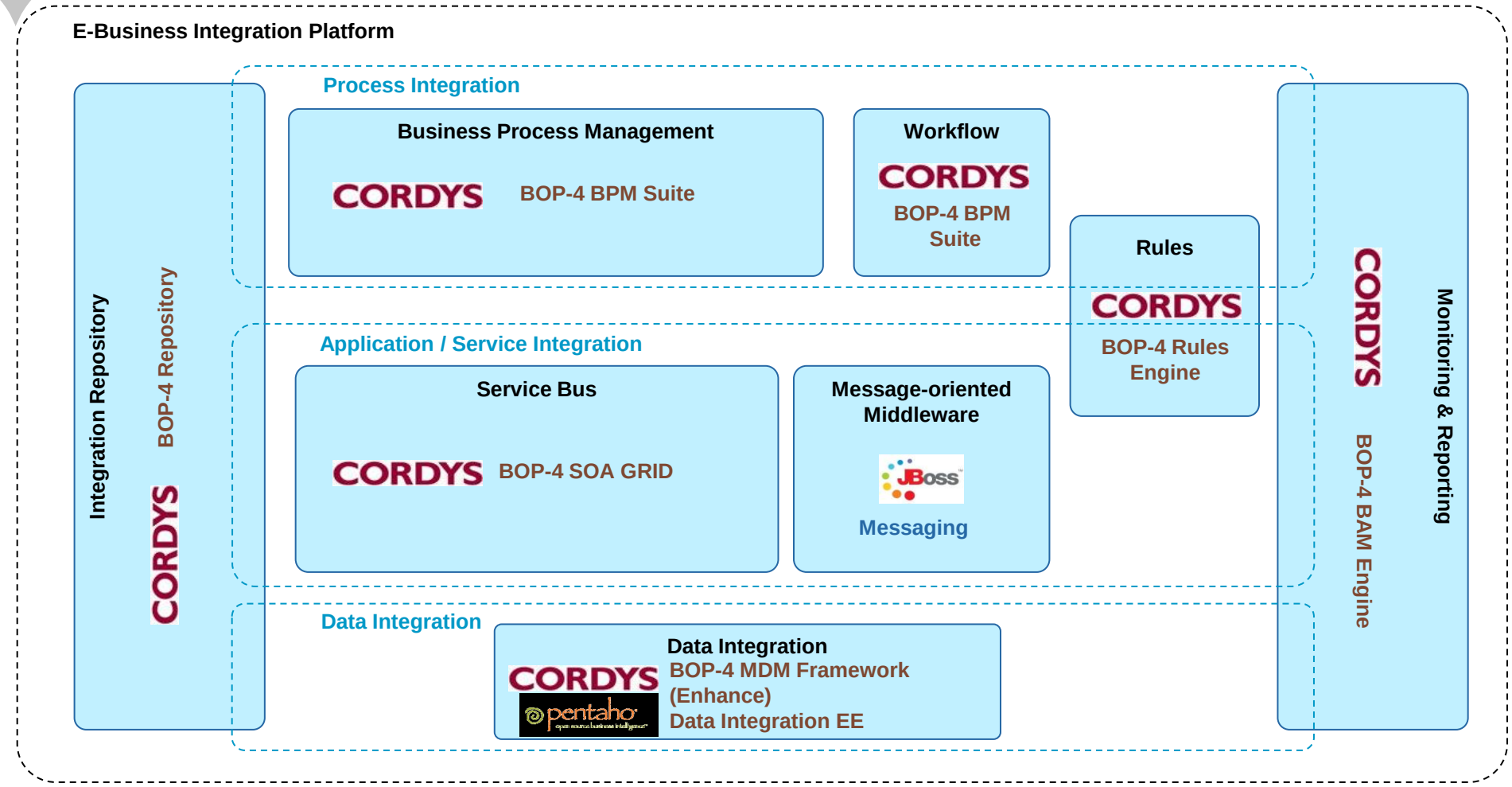
Each integration to be delivered will be considered within a decision tree and the appropriate integration mechanism identified

Overlay of Conceptual Integration Services within the Logical Integration Component Architecture



The conceptual integration services, identified from requirements, are grouped within logical components which in turn are instantiated through physical solutions

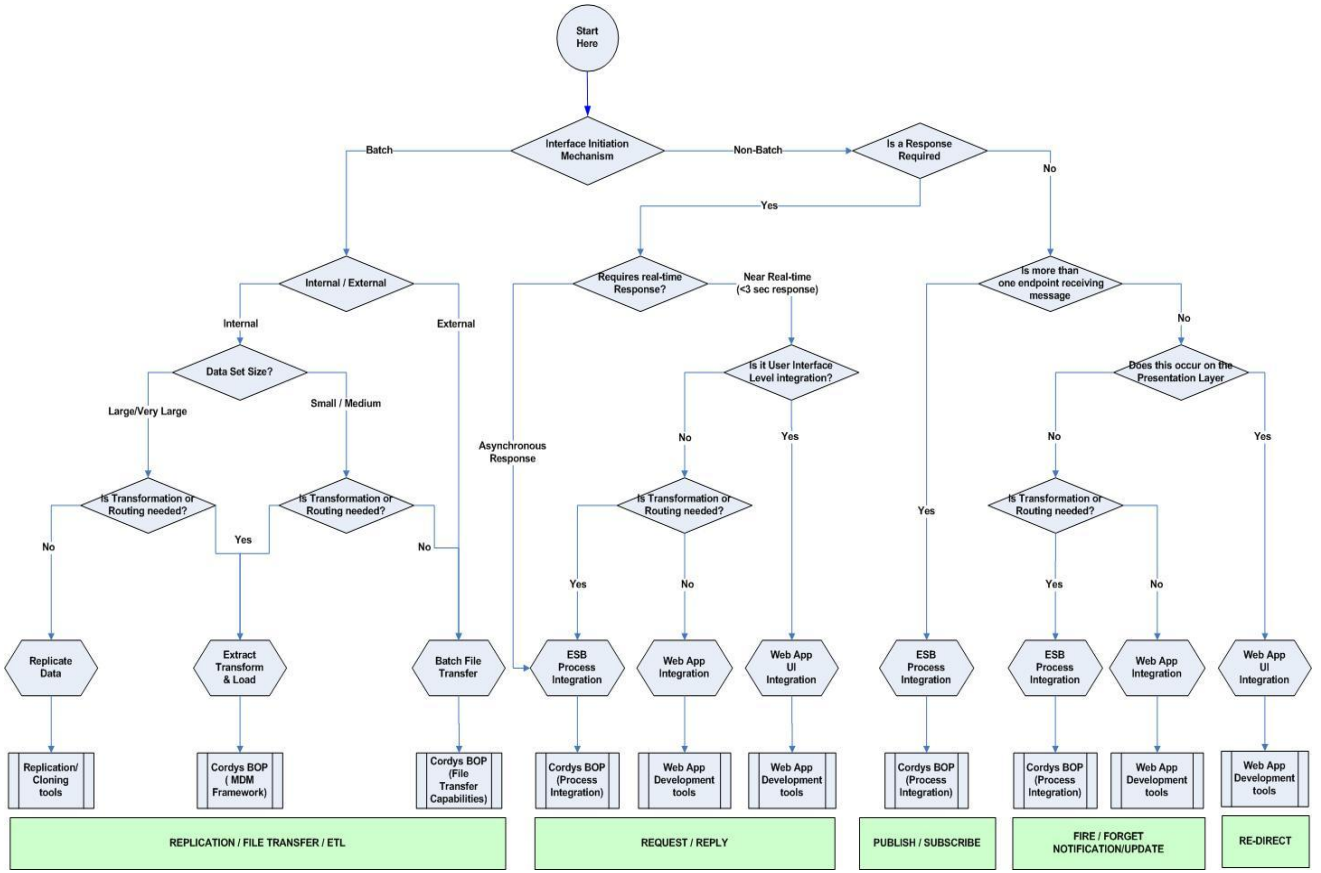
Overlay of Physical Integration Components Within the Logical Integration Component Architecture



The components and physical solutions offer different capabilities, both individually and together. Interfaces are considered through a decision to identify the appropriate integration mechanism

Integration patterns are delivered through the chosen integration architecture

- The interface catalogue classifies each interface
  - Replication / File transfer / ETL
  - Request / reply
  - Publish / subscribe
  - Fire forget / Notification / Update
  - Re-direct

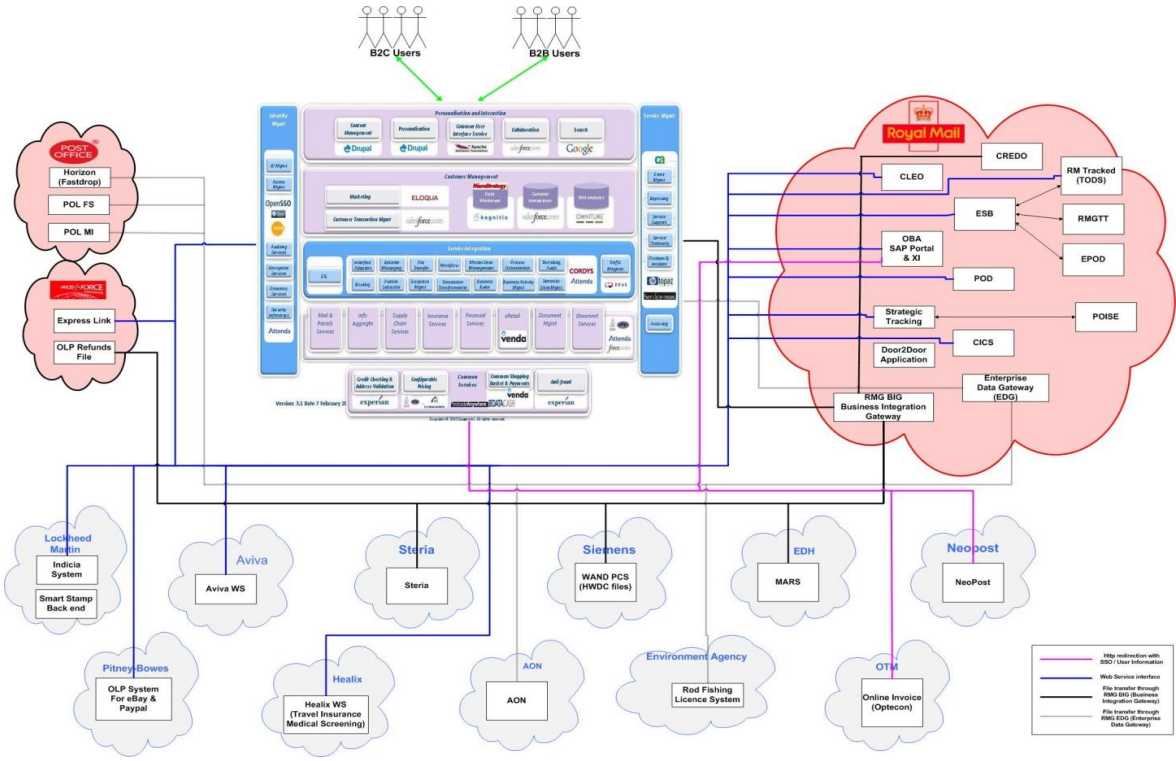


The different integration patterns can be used to differentiate all of the interfaces in an Enterprise view

Interfaces support touch points between systems

At the highest level, all of the integrations can be overlaid onto one figure to provide an enterprise view of the interfaces between the different systems – eBusiness, Client and partners

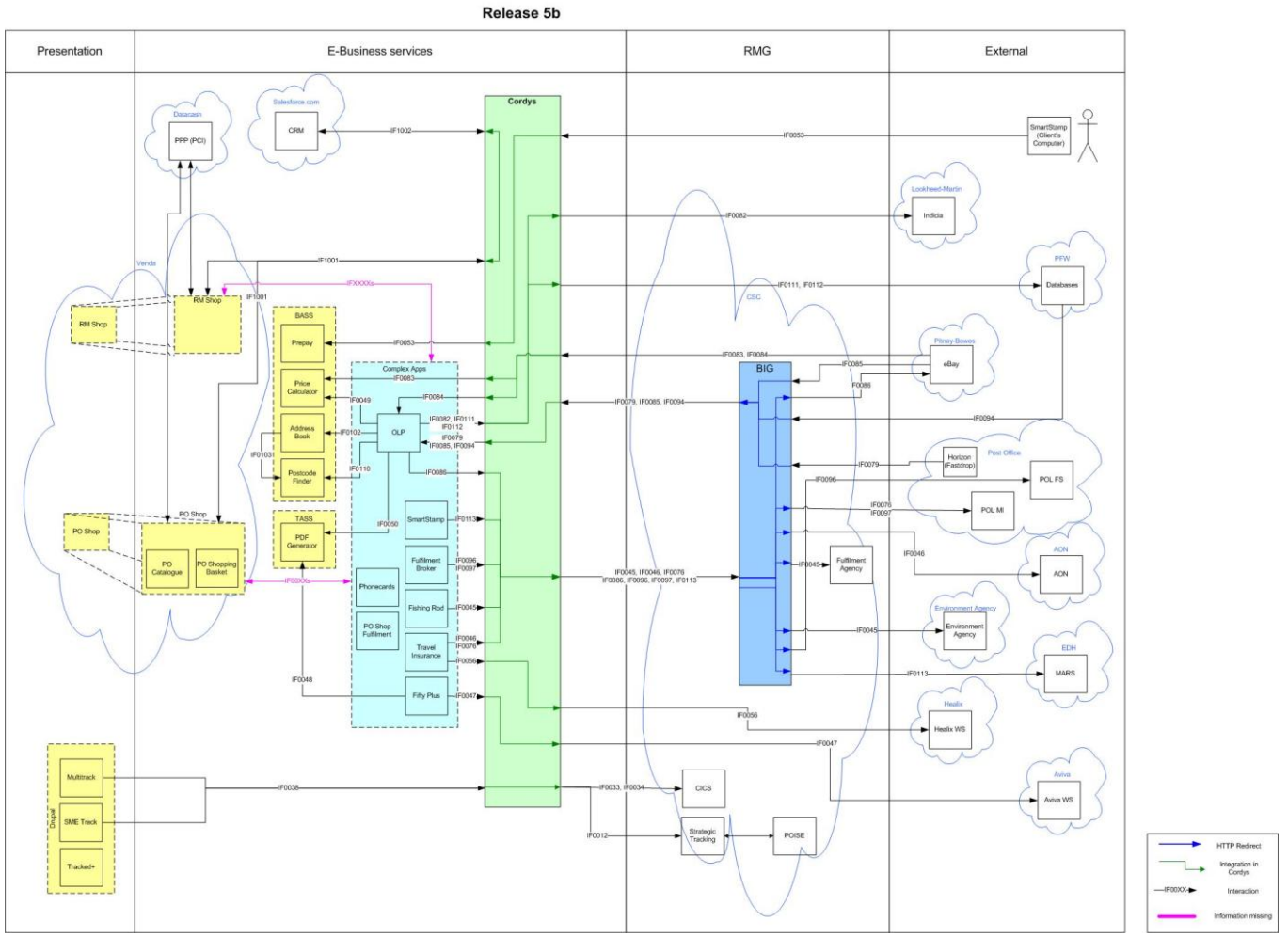
- The key categorises the integrations by technology
- Each line may represent a number of different messages
- Message management through intermediary services are not shown at this level



The next level shows the individual interfaces although, for clarity, these can't all be shown on one picture

We show the interfaces on a physical diagram that delineates the organisational domains

- These diagrams are produced for each release
- Interface references refer to the interface catalogue

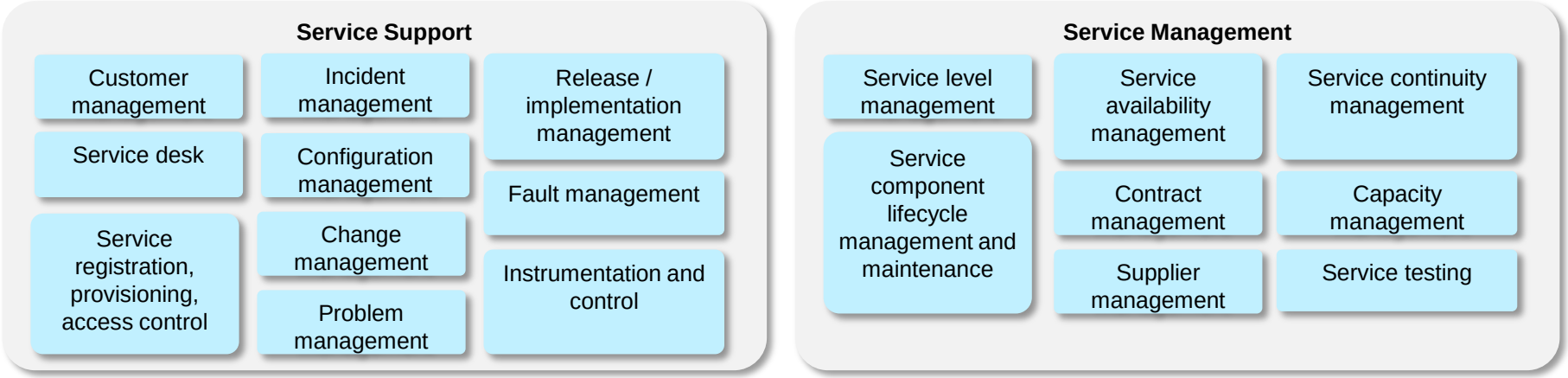


Service Management and Support Architecture

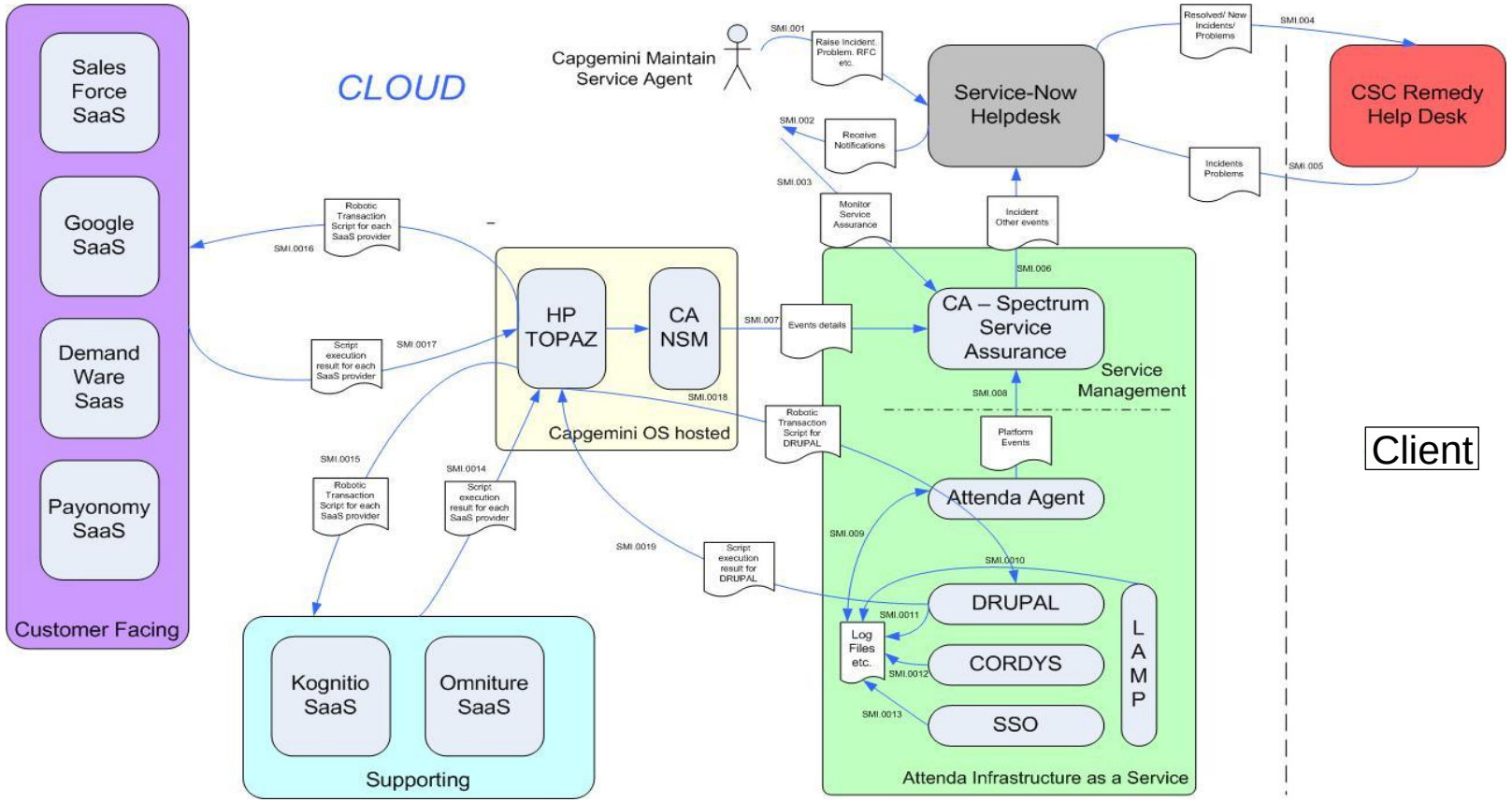
Our service management architecture is driven by requirements and best practice

- Client NFRs for operational management
- Conceptual Service Management services catalogue together with logical grouping
- ITIL v3 best practice for information technology service management

- Our overall premise is to ensure Capgemini Maintain Service has a comprehensive set of processes and tools to deliver **end to end service management**
- We developed a SM services catalogue driven from Client requirements and cross checked with IT Infrastructure Library best practice



The full deployment physical architecture depicts the SM applications as well as the interactions



The SM architecture will be deployed in line with the growing footprint of content and applications

Business Services and Client Capabilities Architecture

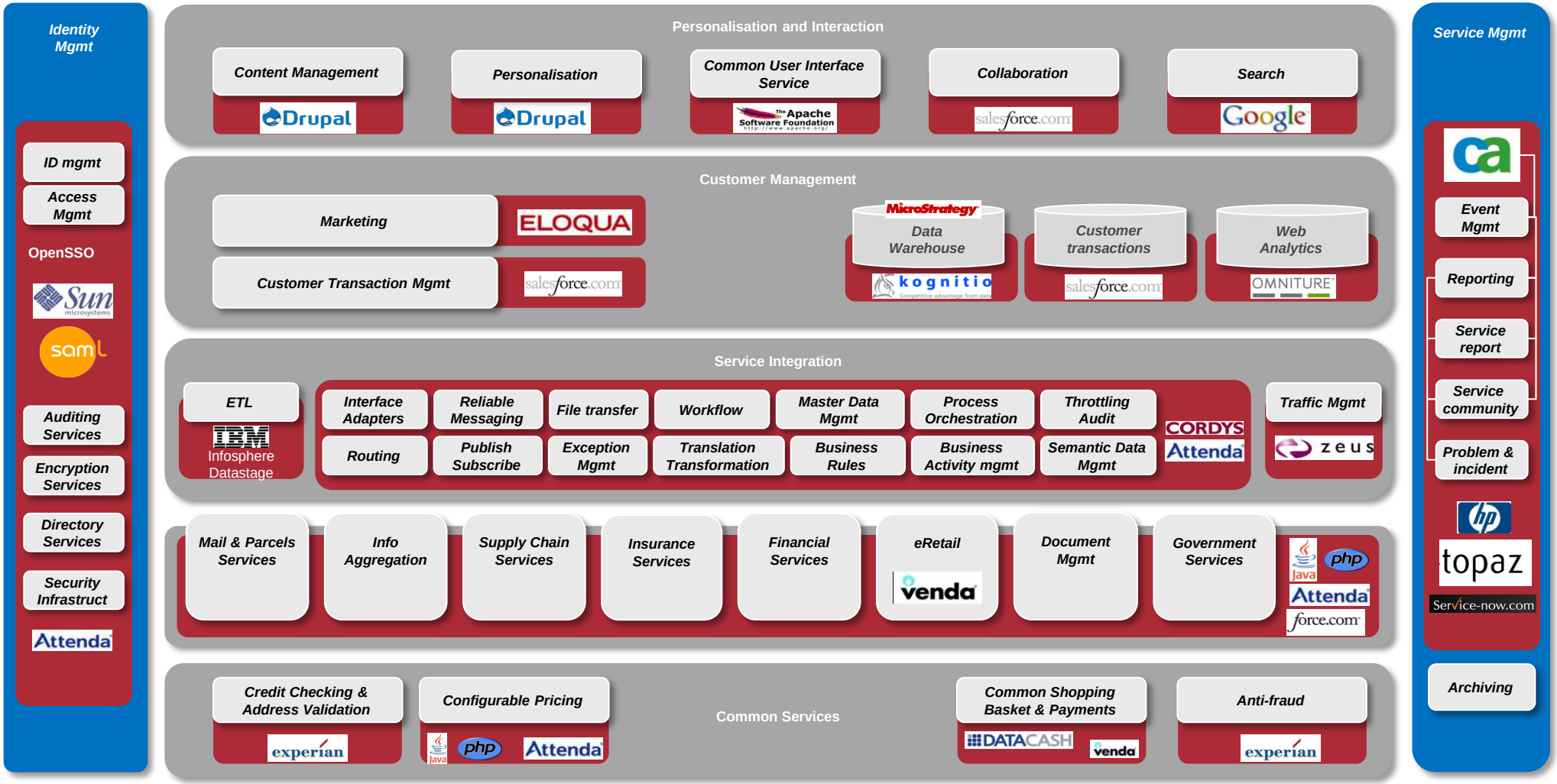
Beyond ‘Migrate’, a core value of the eBusiness platform is the delivery of business and technology building blocks

- We have already seen that the architecture of the eBusiness platform can be described through the traditional architecture aspects. In addition, the architecture can describe the business and technology capabilities that provide the building blocks for extending the eBusiness platform into the future

- **Business Transformation**
  - PAF lookup
  - Label printing
  - Track
  - Pricing
  - Fast drop
  - OBA
  - Data import
  - Billing
  - Address book
  - Notification
- **Technology Transformation**
  - Usability and accessibility
  - Data search
  - Tagging & Tracking
  - Content management
  - Measurement & MI
  - Channel Integration
  - eCommerce
  - Registration
  - Single sign-on
  - Process orchestration
  - Fraud & ID checking
  - Pricing engine

Architecture describes how these building blocks are delivered

The eBusiness High level ‘H’ Reference IS Architecture identifies the ecosystem of applications that are being deployed



The principles to deliver Digital Services differ from those of traditional IT delivery

	Previous Principles	Revised Principles
1	Business benefits and requirements drive IS investment and architecture decisions	No change
2	Timing of investment towards uniformity and standards is based on benefits case and opportunity	No change
3	Reduce complexity, cost of integration and TCO through use of standard solutions.	*Reduce complexity, cost of integration and TCO through use of standard solutions* ***where possible***
4	Reuse existing standard solutions before investment	*(Think global, act Local) look to reuse global experience, solutions and frameworks before investing locally*
5	Choose integrated package solutions before custom development	*"Buy not build" to leverage services as they emerge to maximise speed to value.*
	NEW	*Accept the need to manage a federation of services as business and IT boundaries disappear*
6	Reduce the overall product and supplier range, focussing on maturity and risk	***Minimise*** *the overall product and supplier range, focussing on maturity and risk*
7	Embrace industry standards and open SOA architectures	No change
8	Solutions must be scalable in terms of capacity, performance and business change	No change
9	Rigorous adherence to approved IS policies including security strategy, governance and risk policy	*Apply approved IS policies including, security strategy, governance and risk policy in an appropriate manner*
10	Embrace innovation to drive business benefits	*Embrace new and emerging business services to create opportunities*

Agenda

- Digital Transformation
- TechnoVision – Design for Digital
- Digital Architecture
- Summary

Summary

- **A digital world needs architects for digital design**

- **We need a vision what and how to orchestrate**

-**Reference architectures and digital design principles will enhance the Invariants of excellent Software Architectures**

Architects, design for Digital!

THANK YOU!

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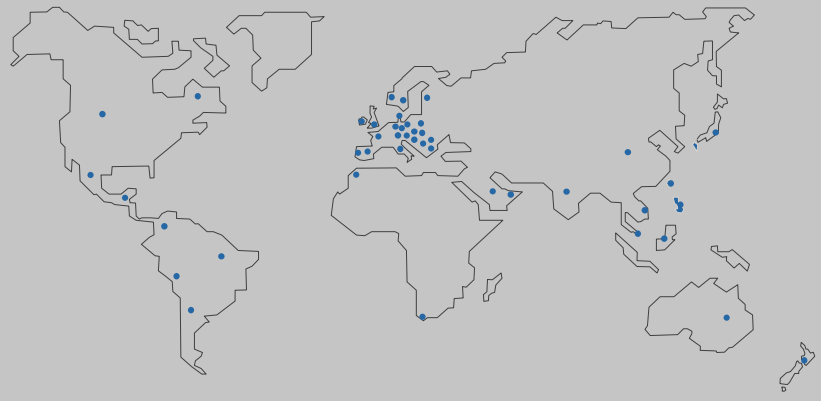

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