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Consumer-Centric Digital Transformation: The Role of Service Orchestration and AI

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Abstract
Consumer behavior and expectations have changed dramatically in recent years, making customer retention and loyalty a matter of company's survival. Recent digital technology advancements allow companies to gather and cross-reference intended and actual consumer behavior data from various different sources. Large, complex data sets can then be converted into service and product recommendations with predictive intelligence to ensure personalized experiences for consumers. These factors combined enable efficient process orchestration which assures service systems synergy and offers smooth service journey for the consumer. However, current information systems can orchestrate processes mainly from an operations perspective, optimizing products and services' economics only. Therefore, we argue that market success requires developing enterprise architecture templates with service orchestration and experience intelligence capabilities at their core to transform information systems from operations-oriented into consumer-centric to allow seamless customer experience along the consumer journey and enabling smart personalization at scale. Specifically, we provide design principles for building experience-driven enterprise architectures and their information systems. By outlining current capabilities and limitations of enterprise information systems available on the market today, we suggest how to move from currently available information systems for process orchestration to consumer-centric service engines with process and experience orchestration features for experience-driven enterprise architectures envisioned by us.
While service design evolves from a focus on separate service encounters to a focus on the consumer's holistic service experience, enterprise information systems are not able to support businesses in centralizing and operationalizing accumulated consumer experience knowledge for service journey orchestration, smart personalization at scale and service experience governance yet. Here, we introduce the use of service experience orchestration and enterprise architecture information systems driven by process and experience intelligence for experience management of digitally transformed enterprises and aim to fill this gap. By aligning the IT landscape capabilities and limitations with recent developments in experience-centered service design, we introduce design principles for experience-driven enterprise architecture design in general and provide recommendations for their information systems in particular.

Keywords : Consumer-centric, digital transformation, service orchestration, artificial intelligence, AI integration, customer experience, digital services, intelligent automation, process optimization, personalized solutions, customer journey, technology enablement, data-driven strategies.

1. Introduction

Consumer-centricity is fundamental to the success of organizations in today's volatile, uncertain, complex, and ambiguous business landscape. Organizations increasingly rely on digitalization and transformation of business operations to better understand who their consumers are and what they need. These transformations enable them to align product and service capabilities and associated processes with evolving consumer preferences over time. However, it is often observed that organizations embark on digital transformation journeys where the technology-centricity of the journey undermines its intended objectives, and businesses wind up with extravagant technology deployments that do little to enhance consumer engagement. The rise of Artificial Intelligence further complicates matters, adding another layer of technology that organizations must deploy, integrate, and manage while overcoming challenges around data privacy, trust, and transparency.
In this chapter, we provide a framework for successful consumer-centric digital transformation which centers around consumer perceptions and experiences with the value propositions that organizations provide through their products and services. Our framework is grounded in consumer behavioral theorizing about experience co-creation and service orchestration and experience management. We argue that organizations require strong capabilities for consumer experience orchestration if they are to succeed in shaping and managing consumer experience perceptions across the many moments of truth in the consumer journey with the organization. Such experience orchestration capabilities are underpinned by experience insights generated from the deployment and use of consumer experience management capabilities, which leverage AI tools and algorithms to provide the data-rich, contextualized insights needed to enable timely, informed orchestration interventions.

2. Understanding Digital Transformation

Digital transformation is often misconceived and mixed with concepts such as the digital economy, market digitization, digitalization, and new digital technologies, frequently followed by the "everything is digital" mantra. When a company switches to an e-commerce format or a bank opens a mobile platform, these companies are embarking on their digital transformation journey; this journey becomes real for the company when the new customer-centric digital strategy is designed and aligned

with the execution of supporting digital initiatives and projects in order to innovate and deliver new and renewed digital services and solutions to all the targeted and relevant customers. For companies, digital transformation is therefore a journey from the now to the new, paving the way to their expected future outcomes.

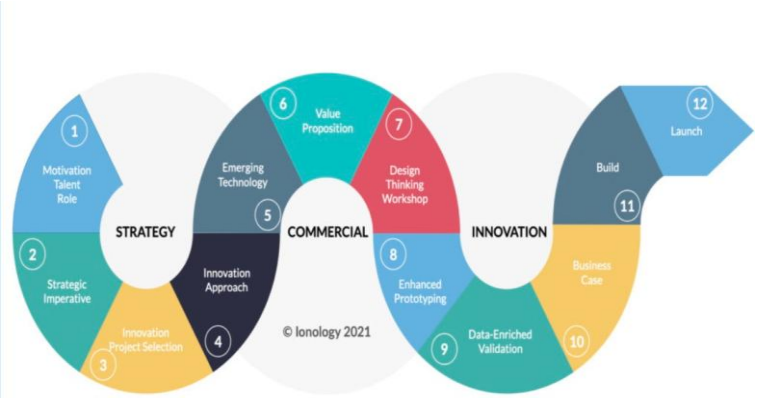

Fig 1 : Digital Transformation Framework

While consulting companies and business thinkers emphasize that companies are mostly using digital transformation to disrupt and strongly innovate their value offering and their business model, the general view is that for data and technology intensive companies, digital transformation should also be seen as a journey to move up in the digital value chain, by progressing from using digital technologies at the basic levels of enabling efficiencies or improving service delivery performance, by digitally recovering or renewing the core to become at the leading edge of the new digital economy by creating and deploying new digital and data technologies any-time, any-place, any-form to catalyze innovation in services, solutions, products and business model.

2.1. Definition and Importance

Digital transformation (DT) refers to the process of using digital technologies to radically alter business performance. This process has two sides: the first is descriptive and refers to the organization's actual value of managing DT; the second is prescriptive and identifies a set of priorities that can favor the leverage of such value. While the descriptive side is deeply rooted in the business concept of transformation, the prescriptive side is tightly related to the use of the term transformation. In fact, the importance of the word "transformation" relies on its ability to delineate an evolution path that passes through an intentional step of deliberate change of a strategic characteristic/characteristics over a certain period of time. As such, DT can represent the company's transformational path toward the exploitation of digital technologies for producing products or services or for managing processes or parts of priorities/critical factors such digital technologies-enabled innovation processes, sourcing process optimization, relationship with suppliers, customers and other stakeholders, optimizing organizational and cultural structures, ecosystem development. Over the years, digital innovation has enabled the introduction of multiple technological applications that, in turn, have allowed companies to optimize and transform various aspects of their business over time. None of these successive shifts, however, is comparable to the impact of the widespread diffusion and use of advanced digital technologies within and across companies, in terms of scale, scope, speed, and intensity of potential future changes. Such interfaces are very close to the consumer's real needs and can therefore guarantee a deep current and future value offer, but they also open the way to terrible threats. The term DT should underline that only a few companies have embarked on such an evolution path.

2.2. Historical Context

Digital transformation is a compound of two concepts that, as such, deserve to be unpacked: the digital, and transformation. Digital technologies are that set of combination and interdependently functioning set of technologies, their growth facilitated by an invariably growth of computing power, that when taken together emphasise the code nature of capital and information at least since the last quarter of the 20th century. Light and local data have undergone commodification and globalisation, such as other global, cheap and light transport networks, and solutions that automate the flow of passengers and cargo chasing entirely different business models from those of traditional airline companies and shipping companies. A signal oil shock and deflation in the early 1970s had preceded the gradual liberalisation of the financial capitalist economy. Financial markets had operated the disintermediation of financial intermediaries, while the low cost of computers banks started to introduce in transactions largely consisting in the making, the co-ordination and a profit on the length of delays in settlement and transfer, was changing travelling by plane.

When services had gone digitalising, and schools, universities and publishers had started developing digital classrooms, interactive platforms, e-learning or distance education, and were recognising certificates digitally signed and time stamped, by 1993 the internet was on the verge of becoming the new only universal service that could provide every other type of service. Emerging at the nexus of macroeconomic cyclical growth, the introduction as universal ubiquitous telecommunication network of the internet and the digitalisation of financial, informational, educational, recreational, commercial, business, logistical, medical and governmental services was the dotcom bubble already indicating that. Although scholars had already highlighted how digital transformation involved more than technology, arguing that it entailed a rethinking of service design and

production around data and the interactions in which these are used to render greater efficiency and consumers' enablement, this aspect of digital transformation had become apparent only after the bursting of the dotcom bubble.

2.3. Current Trends

Today, virtually every sector of the economy has launched a digital transformation strategy. Digital transformation comes with the promise of improving the quality of products and services, the efficiency of production and distribution processes, transparency and trust in organizations, the effectiveness of public policy, well-being and social cohesion, etc. It will also create a new source of growth, based on accelerating productivity gains and increasing the variety and quality of goods and services offered. In this regard, digital is not just a new means of production, like manufacturing or transportation, but a radical innovation in the way production, transaction and governance processes within and between organizations are designed and implemented.

Digitalization is often equated with the transition to the digital mode of storing and transmitting information. Digital transformation, on the other hand, emphasizes the deep transformations that the pervasive and affordable digitalization of society and organizations trigger in the economy, organizations and business models, work and consumer models, and in our relationship with public authorities. These transformations are largely driven by the unprecedented reduction of the costs of storing, processing, and transmitting large volumes of information, and the explosion of consumer-generated digital data through various platforms. In this regard, data has become both a new factor of production, along with labor and capital, and a new source of business and industrial intelligence and competitive edge.

Data has become essential to support work and consumer choices, inform the design and implementation of public policies, guide investments and enable innovation. The digital transformation of consumers and organizations raises new challenges regarding data quality, access and sharing, the standards for interpreting Big Data, data governance, privacy and security, and data ownership. It also creates new opportunities for addressing these challenges through data services that leverage intelligence, prediction, automated or augmented decisioning, and collective intelligence.

3. Consumer-Centric Approach

In this work, we focus on consumer-centricity rather than customer-centricity or user-centricity. The term consumer is more inclusive and embraces all end-users of a service. In our analysis, we specifically refer to the telecommunication environments. They constitute an ideal candidate for our examination due to the profusion of services offered, the segmentation of users, and the continuous evolution of innovations in systems and processes that do impact service configuration. A consumer-centric approach emphasizes the consumer's self-adopted perspectives on the value they expect to gain from the service. The company offering the service needs to identify the consumer state-of-art to create emotional bridges to the proposed value and aspirations. Involving personal beliefs may trigger activation or create barriers for service acceptance and use.

When designing a service, contemplating a mechanical perspective only may overlook those emotional components that impact consumer behavior to use the service or not. Focusing on service-driven logic only might soothe disruptive or aspiring realization but may close doors to retaining or stimulating existing users. In a world where technology enables the design of similar services in terms of functionalities and performance stimuli that foster emotionless consumer behavior, a consumer-centric approach is a source of differentiation. The sensitivity matters as it concerns the expectations and the willingness of each consumer to adopt the service to satisfy their own personalized micro-needs and emotions.

Equation 1: Customer Experience Score

$$CX = \frac{\sum_{i=1}^{n}(S_i \cdot W_i)}{n}$$

Where:

- CX = Overall customer experience score
- S_i = Satisfaction score at touchpoint i
- W_i = Weight assigned to touchpoint i based on its importance
- n = Total number of customer interaction touchpoints

Implementing a consumer-centric approach is still facing difficulties. The main reasons are a fragmented organization that splits the service cycle phases, from technology optimization to service design and marketing, together with the lack of formalized and specific discipline to investigate the consumers' emotional and motivational processes. The latter must support the different service lifecycle activities, plus the transient nature of a service that is refined and develops with its positioning along the life cycle.

3.1. Defining Consumer-Centricity

Adapting a customer-centric approach has undergone various transformations since it was first conceptualized. From initially emphasizing the importance of understanding customers' needs and wants, to then promoting customer satisfaction as an organizational goal with the purpose of achieving market success, and finally proposing the 'value proposition' notion to explain why customers prefer certain products or services over others. The pursuit of a consumer-centric strategy is not an easy journey. It requires organizations to learn how to adopt a holistic business view of the customer. Because of this, the set of capabilities supporting a consumer-centric approach execution evolve and becomes more complex as organizations progress along their consumer-centricity journey.

As a strategy, consumer-centricity can be categorized into two strands, focusing on either consumers wants and complaints or on consumers perspective of service value. The first school of thought proposes the adoption of a proactive outward-looking perspective, where the goal is to proactively identify consumers' expectations on price, quality, and services attributes and develop solutions based on their complaints and dissatisfaction. The second school of thought concentrates on a consumer's viewpoint of value relative to that of competitors, with the goal of superior service value. It recognizes that the consumer compares service providers on the basis of what they get, rather than just a simple transaction price, and would choose the one offering the highest value net of price. Despite the contrast in focus, the two approaches complement each other as each highlights a related aspect of consumer behavior.

3.2. Benefits of a Consumer-Centric Approach

The consumer-centric approach has a number of benefits including heightened consumer engagement, greater value realization, the ability to leverage an integrated ecosystem of external collaborators, and improved financial performance. The consumer-centric approach creates a follower-fan relationship that strengthens the consumer-company bond, which, in turn, creates a protective loyalty moat against competitive incursions. Clear articulation of an organization's purpose is critical in using products and experiences to create connections and deepen relations with consumers. Purpose provides authenticity and personalized appeal to storytelling which, in turn, resonates with consumers.

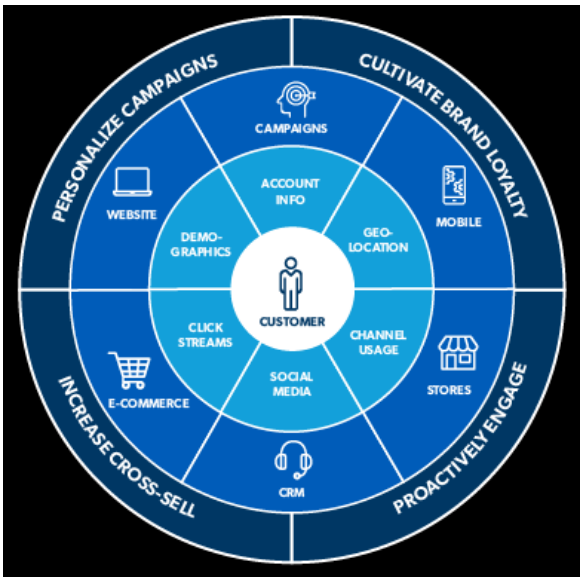

Fig 2 : Client Centric Approach

A consumer-centric approach nudges service providers to brainstorm on what services, opportunities or life events they could extend to the consumer outside the current transaction to surprise and delight them. It allows service providers to start thinking about how the service, delivered on the consumer's terms, can create an emotional connection that heightens loyalty as an outcome. Such authentic connections resonate with consumers' own values as individuals, providing the service organization with an opportunity to leverage their clout as influencers or advocates among their networks. Positive experiences reinforce the consumer service journey, building upon themselves over time and allowing organizations to profitably monetize consumer engagement.

A consumer-centric approach opens up the possibilities of digitally-enabled ecosystems where a rich suite of experiences curated from multiple service providers accelerate value realization for consumers. The importance of collaboration between co-creating partners in the knowledge economy cannot be emphasized enough. Multiple advantages accrue to all partners when they align activity to benefit the end consumer. Consumer-centric organizations develop mutually beneficial partnerships to enable value co-creation that goes beyond direct transaction.

3.3. Challenges in Implementation

The strong market competition and the changing customer behavior are challenges that businesses must face. Business theories and sustainable competitive advantage claim that companies must focus on product centricity or technology innovations within the product and service offerings and market toward the masses to maximize sales with an additional margin. However, with the digital transformation in all industries and businesses, customer behavior has changed due to the influence of social media and the vast information provided by the internet. Businesses must not only focus only on the product or service attribute. The context of the customer's situation is equally important. Therefore, the services around the customer and the business must provide more value than the competitive product to attract the individual customer. Besides, that additional value must be sustained. Several companies have invested massively in data collection and analytics to attempt who, what, and when to sell to each customer. The customer journey mapping and recommendations are heavily discussed in marketing theories. Customer-centricity is not new in business, but it has not been practiced effectively and systematically, and that is the challenge that we see with industry digitalization strategies. The insights gained have no influence in the business as our discussions with industry leaders show.

Studies have defined digital transformation as achieving higher performance with new digital leveraging business processes. However, there is no alignment between the demands to provide that service for the customer and the services that companies discuss in their digital transformation strategies, nor how they can orchestrate digital and real-world services. These are the challenges in the practical aspects when we review industry digital transformation strategies. On one side, these strategies are built with technology framework insights such as physical, digital, or digital twins, but on the other side, the outcome-based differentiation for the customer is not evident, meaning how this technology will support the generation of more value in the customer's journey. Neither is there an explanation of how those digital components will be orchestrated as a service.

4. Service Orchestration

The traditional enterprise operating model, encumbered by complex interdependencies, slow internal processes, and the friction external partners experience engaging with enterprises, inhibits the fast delivery of consumer-centering transformation. Service business model development and acceleration requires an enterprise service architecture that combines business capabilities for effective orchestration, speed, and quality of consumer-supporting services. Service orchestration is the key to effective service architecture design and its rapid componentization into service elements - reusable components that can be orchestrated dynamically into consumer-engaging services.

Service orchestration has an essential role as the design and build of operating model execution systems, building blocks, and their dynamic assembly enables the heart of digital transformation: building consumer engaging elements, how they are connected, and the portfolio of services that respond to different consumer needs. The operational component of consumer-centric transformation cannot be disassociated from the enterprise's business and digital architecture. Service orchestration encompasses organizational components, service journey components, applications, technology interfaces, and cloud capabilities combined to engage the consumer seamlessly in a defined service journey.

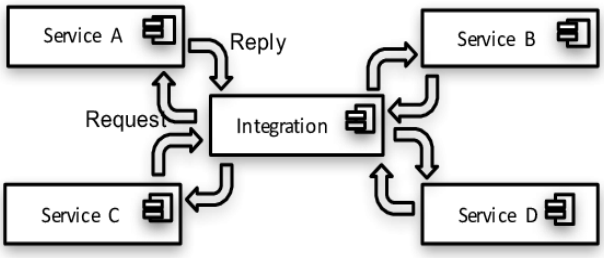

Fig 3 : Service Orchestration

Service orchestration is the combination of business capability components, that allows a business to carry out its goals: how to manage consumers, product offering development, sell its product offering, supply chain management, product offering delivery, account management, and the associated consumer experience. Each of these capability components is the business design point for a group of business processes and the technology. Service business models can be represented as enterprises focused on their services: services transform resources and a product offering is a service with no apparent transformation impact remaining. It is this impact that makes some relationships 'goods based' and others 'service based'.

4.1. What is Service Orchestration?

Service orchestration manages, participates, and monitors the provision of services by third parties while integrating them into Corporate IT. It has emerged as one of the leading enablers of the networked enterprise as it helps businesses interlink the multiple and varied activities needed for them to operate on a day-to-day basis, from the creation of their products and services, through to the customer experience they can provide. An SO must deal with both the structured and unstructured elements of service execution and also work with internal, external, and hybrid systems. It has to integrate resource intensive back-room functions with the more tactile and subjective functions that are customer-facing. Given both the communicative and collaborative nature of services, we are enabling organizations to create a network of virtual work centers that encompass a wide variety of capabilities based around differentiated and value-adding services.

Current systems and software do control and automate some elements of back-room processes; business rules software automates some aspects of front-room processes, but the links between the two are either too simplistic or don't exist. Equally, different organizational functions utilize disparate software, which forces them to work in standalone fashion. Operationally this means that service execution is inefficient and ineffective. In addition, in a complex and dynamic marketplace the simple changes that occur on a regular basis in most organizations cannot be dealt with quickly or intelligently.

SO solves these service execution problems because it is not transaction focused, but process focused. Moreover, these processes can link different organizational functions and multiple companies. Additionally, SO provides a user-friendly interface for management, process participants, and service users that allows simple access to all these processes without concern for the backroom IT systems that drive them. Furthermore, at any time, using SO the status of any process can be monitored and this information used to make decisions both operationally and tactically.

4.2. Key Components of Service Orchestration

Enterprise service orchestration and consumer-centric digital business transformation supported through an extensive ICT service ecosystem needs components and a shared understanding of the openness and extensive capabilities of this potential.

In a digital ecosystem, various partners can develop services and service capabilities, while also offering them through others partners service channels. Flexibility in service solutions, service combinations, and service partner offerings are required to address the diversity of differences of various customer segments and their specific needs in different value realization contexts. In enterprise service orchestration, the core service generating and value realization service is often a combination of services provided by the enterprise and its various partners. The enterprise need to orchestrate its own support services for consumer contact and service reliability in tight close collaboration also with partners service contribution, when for example physical delivery services or helpdesk services are provided by some partners. The service partner ring supporting the core service offering needs to be kept short and relevant, or otherwise customers do not expect a seamless consumer experience. Consumer contact can also have significant maneuvering capability in pushing and pulling in the orchestration of the core service offering and its supporting sub services. In business-to-consumer markets where consumer service expectations are similar there are also opportunities for extensive service innovation, where even one service orchestrator enters an adjacent customer service domain. But the business success must be part of the business ecosystem, creating value also for consumer other than the orchestrator.

4.3. Role in Digital Transformation

In the previous sections, we explored Service Orchestration, defining its general structure and its components. We emphasize a perspective guided by user experience, given that our main aim is to build Digital Services around the end-user. Thus, Service Orchestration becomes a Consumer Experience-oriented Digital Transformation enabler.

The Digital Services that compose this experience should be designed and implemented to meet the opportunities and challenges imposed by Digital Transformation, especially behavioral or attitudinal.

Service Orchestration allows Digital Transformation to have a path, the Digital Services Design and Deployment, regarded as first-class citizens. It articulates the evolution of the whole organization, not only the technological aspects. Service Orchestration gives organizations the required flexibility and agility to offer and renew Digital Services, as needed. It is through Service Orchestration that organizations guarantee a coherent user experience. By providing a set of options and possibilities throughout the user journey, the Digital Services are articulated to deliver value to both the Users and the Organization. Moreover, Service Orchestration allows organizations to learn and gather insights in one Digital Service so that these learnings can feed into the implementation of other services.

Given this brief background concerning Service Orchestration, we present here the SOλX conceptual model. It details the basic elements of Service Orchestration, which can be (and should be) used in different digital environments, focusing on the user experience. The name SOλX comes from the Service Orchestration concept but adding the functions of alignment and attunement prepared by the Digital Services design and implementation to enable Digital Transformation to happen. It can be seen as a Service Orchestration conceptual model.

5. Artificial Intelligence in Digital Transformation

In the midst of the unstoppable digital transformation of the business environment, artificial intelligence (AI) has emerged as the cornerstone enabling companies to reach new heights. Indeed, AI technologies have penetrated into all business areas, and we can assert that it is hard to think of any industry where AI will not sculpt the future. It is therefore no surprise that most organizations are outlining strategies on how and where to best try to harvest AI's transformational potential. AI offers essential new capabilities that, if designed and utilized correctly, can significantly accelerate and increase the effect of digital transformation initiatives. In fact, AI is radically innovating the technology stack that companies are using to automate, augment, and transform business processes, products, and services. This section aims to provide an initial overview of AI technologies, their effects on companies' consumer experience, and their use in business analytics. Although many different interpretations of AI exist, we will not enter into philosophical discussions on what intelligence is nor on what should be categorized as AI. Rather we adopt a pragmatic and general definition and define AI as a group of technologies that can analyze data and achieve specific tasks – such as speech recognition, envisioning, or natural language processing. AI is today performing many different functions at high levels in a variety of sectors, including legal services, business services, financial services, manufacturing, logistics, health, and agriculture. Research on the use, capability development, and effects of AI on organizations is booming and maturing, with its findings being exported to business.

Equation 2: Digital Maturity Index

$$DMI = \frac{A + P + C}{3}$$

Where:

- DMI = Digital maturity index
- A = AI adoption score (0 to 1 scale)
- P = Process automation coverage
- C = Customer experience enhancement score

5.1. Overview of AI Technologies

Digital transformation is often pushed by the adoption of the latest information tech by organizations and communication tech through which consumers may access and use services. The first motivates internal changes in organizations, like adopting cloud and mobile systems, new communication capabilities, agile or DevOps software practices that allow agility and continuous adaptation, the maturing of new service and product development capability, using data analytics for decision making, etc. The latter drives changes in relationships with outside market stakeholders, like having an omnichannel presence,

using new service delivery channels that lower friction such as chatbots or apps, or deploying self-service capabilities based on advanced technologies. Advanced technologies, such as Augmented or Virtual Reality, Autonomous Vehicles, the Internet of Things, and Artificial Intelligence are at the ultimate edge of digital transformation, as they often alter completely both internal and external processes. Among these techs, AI is the most radically disruptive and general purpose, enabling a reimagination of service and product processes, capabilities, and economic models.

AI or Machine Intelligence refers to a set of technologies that enable systems to exhibit intelligence, enhance and imitate human capabilities; a subset of IT that is able to sense external data, understand the context and the significance of its content, and adapt, learn, and act in consequence. This set of technologies has evolved rapidly in recent years, resulting in enabling increasingly complex, capable, versatile, and real-world applications by leveraging vast amounts of data and cloud computing processing capabilities. Affordable systems use, at times in combination, structured and unstructured data as inputs, AI technologies like Natural Language Processing, Computer Vision, Speech Recognition, Knowledge Representation and Reasoning, Machine Learning, Logic Reasoning, heuristic search, and Neural Networks, and output actions in recognized voices or virtual agents, or use Robotics to interact directly. These services and products are used for detecting behaviors, providing recommendation, analyzing patterns and indicating deviations, and enabling dialog.

5.2. AI's Impact on Consumer Experience

Although Artificial Intelligence technology has been already used in several consumer applications for some years now, its impact on the consumer experience has been still somewhat limited. The primary goal of AI in consumer-facing applications has traditionally been to enhance efficiency: saving consumers from effort, expense and/or time. By doing so, AI enables companies to provide a better service to consumers, ultimately enhancing satisfaction and perceived quality. Examples of efficiency-driven AI applications are chatbots, which take care of easy routing tasks, visual search, which enables customers to find the product they want more quickly and easily and personalized content and product offerings, which allow consumers to find the products or services that match their needs quicker. New and more sophisticated AI capabilities, however, are transforming AI from a consumer service-enablement technology to a true consumer experience-enhancement enabler. AI systems are increasingly being used not only to overcome consumers' efficiency barriers, but also to help them achieve personal goals, facilitate experience-journey orchestration or deliver emotional engagement. AI's impact on the consumer experience is becoming more profound as AI is evolving from traditional use cases in which Artificial Intelligence automates certain consumer tasks or actions to new applications that are breakthroughs in AI cognition, perception, language and action skills will allow companies to use AI to augment not only decision making or non-routine tasks assisted by supervision but also routine tasks completed by consumers. AI systems will not only provide recommendations but will act as new, trusted, autonomous agents on behalf of consumers, in areas as diverse as travel planning and on-boarding to investments, home construction and management or elder care.

5.3. AI and Data Analytics

Organizational investments in data infrastructure and advanced analytics are driven by the belief that superior insights will deliver superior decisions, and superior decisions will result in improved operational and financial performance. The hope is that improved insights can lead to improved decisions in all areas of the business, from marketing and selling to merchandising, fulfillment, and customer service. Answering basic questions about product performance and consumer behavior is not cheap, and therefore answers are not sought after and may not exist when needed. Corporate generated data are mostly descriptive; multinationals frequently lack the organizational ability to create credible performance estimates in individual markets that can be compressed to manageable corporate level data.

Data-solving bureaucracies with analytics capabilities focused on all geographic markets can lead large consumer product companies to reshape their marketing strategies. They can provide insights into which product characteristics drive the usability in which markets, which communication vehicles are most effective in building brand equity and are most appealing to the local consumer, and which buy decisions impact brand choice. Analytics surfaced ideas for the grocer's private-label rollout, such as taking advantage of its monopoly in opening-price-points. Service optimization models guide decisions about how many items should be warehoused at different locations in anticipation of seasonal surges in demand and other events, which led to boost purchases of products associated with football parties.

6. Integrating Service Orchestration and AI

Digital Transformation aims to establish value-adding processes using tools and technologies. The entry point for further study, the interdependencies of marketing service tools originally discovered in earlier work, could be substantiated by the relevant data from a particular European online hotel broker. The report gives a specific example of the automatic coordination and management of business services. Subsequently, assigned to the topic of behavioral digital transformation, different use cases and rules were developed that serve as bases for Digital Transformation strategy consulting and business service monitoring.

In this context, leveraging AI-enhanced algorithmic self-healing technology, digital symbols – search engine entries, shop ads, personalized recommendations, and so on – could serve as focal points for the orchestration of behavioral service monitoring. These could be made user-specific and secured with the modeling. Therefore, the leading question either refers to the application of specific algorithms by company-internal data sources in the orchestration of the service system or, in general, to the integration of the physical world in the development of digital market places. In this respect, it seems to be necessary not only to understand the logical sequence of on-site actions as an essential feature of activities in the firm during Digital

Transformation and both printable and clickable symbols as qualifiers of digital market experiences, but to make this visible through the embedding of AI in market-oriented Digital Transformation models.

Equation 3: AI Service Efficiency

$$ASE = \frac{R_{AI}}{R_{Total}} \times 100\%$$

Where:

- ASE = AI service efficiency percentage
- R_{AI} = Number of service requests handled by AI
- R_{Total} = Total number of service requests

6.1. Synergies between Service Orchestration and AI

Over the years, many experts have employed the term "AI orchestration" to express the fact that, generally, orchestration techniques work in conjunction with some kind of AI strategy in many services. For instance, the areas of cloud computing, edge computing, and microservices have proposed advanced algorithms to coordinate a multitude of microservices, cloudlets, or edge nodes, usually based on AI techniques. More recently, novel services based on large language models have grown immensely. A large language model is a particular architecture of neural networks that utilizes a deep learning process which requires the performance of many synchronizing services. Once a service, such as online chat, hosts millions of users worldwide, it then requires a strong orchestration architecture due to the size of its temporary workloads. The combination of AI and service orchestration has many synergies that have only recently been presented. As a result, this section will not focus on classical AI topics within the area of service orchestration.

On the one hand, we describe how all of the central paradigms of service orchestration can be leveraged by AI. On the other hand, we explain how, generally, AI systems will benefit from enhanced techniques on their orchestration. We delve into the beneficial tools that can be developed, and the missing techniques or policies that have not yet been proposed. In the framework of this section, service orchestration is understood primarily as the coordination of non-AI enabled services, perhaps those based on microservices, edge computing, or cloud computing, as well as other more classical distributed systems. AI systems refers to those neural intelligent architectures based usually on supervised or unsupervised deep learning techniques, that have the ability to emulate advanced cognitive functions of human intelligence. The main types of AI systems are generative models based on huge language models, transformers, recent large-scale multimodal models, reinforcement learning architectures, few-shot and zero-shot learning, and conversational agents.

6.2. Case Studies of Successful Integration

Providing integrated services to a consumer has challenges of different types, such as, high variables in publicly available services and difficulty of estimating availability, suitability and prices for every variable. These are challenges for many industries including tourism and travel. There are many vertical solutions which provide their customers with better connectivity for specific problems in the above domains. For example, logic for travel also needs logistics. Digital businesses have developed solutions for mobile and land logistics for long-haul agencies. Their focus was serving or connecting the land and city logistic offers in a complementing way. The focus was on providing their customers the best combinations of much smaller time windows rather than the cheapest. Such systems have been integrated with many airline, booking and other services. The development of solutions for multi-modal transport, to reach the airport but also after a flight has been underway. Verticalization of such systems has been focusing on the long-haul part. Recently platforms have emerged which go deeper. They include all required layers for travel and destination logical connectivity. They take specific attention to entertainment and well-being, dynamic billing synchronization and provide specific customizable business logic. Such platforms validate all service calls for the involved providers and allow the others to manage new providers connecting new supply and business logic defined by the travel agencies. For these layered stacked suites, plug and play solutions are being developed by third parties, to provide entertainment, tourist options, hotel bookings, product unique business logic, validation and connection for their clients. Using the same layered logic for web building, have begun to connect these different stacks in non-travel industries.

7. Implementation Strategies

A successful service orchestration and an AI solution for consumer-centric service delivery requires more than simple technology deployment. Innovation-oriented organizations view the implementation of such solutions as a part of their ongoing digital transformation and undertake such projects with the objective to redesign entire workflows, augment and mobilize an evolving ecosystem, and rip unprecedented efficiencies. Big bang approaches undertaken for rapid transformation have been shown only to succeed in creating a negative culture by alienating employees. Given that such early implementations often lead to inflated cost structures, organizations should therefore plan first and then invest selectively in technology solutions that create a lower-cost structure.

Projects following the 'twice bitten, thrice shy' approach, establishing important change initiatives only after the infrastructure enabling such transformation helps engage, enable and augment service employees embark on a more evolutionary implementation strategy towards lower operational costs. Enterprise ecosystems are designed and executed over an evolving framework. Forward-looking organizations invest in new service solution technology. After selecting the software platforms and development enablers, they integrate these operations into their existing enterprise ecosystem and enterprise architecture to carry out the orchestration of the other enterprise core and non-core services. These companies subsequently invest in

augmenting their service employees after implementing large embedded AI projects to reduce cost. Organizations undertaking such a careful, multiyear transformation shape their capital allocation, spend early dollars behind the enabling infrastructure and establish functionally-matrixed shadow IT organizations to trial and show measurable results from the use of the selected platforms. The ability to realize business impact through change management execution – both driving initial adoption up to the upper 75% of the organization, but also developing an innovation-execution rhythm that enables a focus on "how" as much as on the "what" of implementation through best practices is key.

7.1. Planning for Digital Transformation

Companies adopting Digital Transformation (DT) have to recognize that for DT to succeed, it is much more than a project; it is a full-blown program that will require investment as part of a longer-term transformation strategy which is aligned with the overall objectives of the business. Also, it is imperative to understand that Technology enables and facilitates DT, but ultimately it is about rethinking how Value is created, delivered, and captured through your Value proposition, supported by your Value networks. These two principles should guide businesses when planning their Digital Transformation investments.

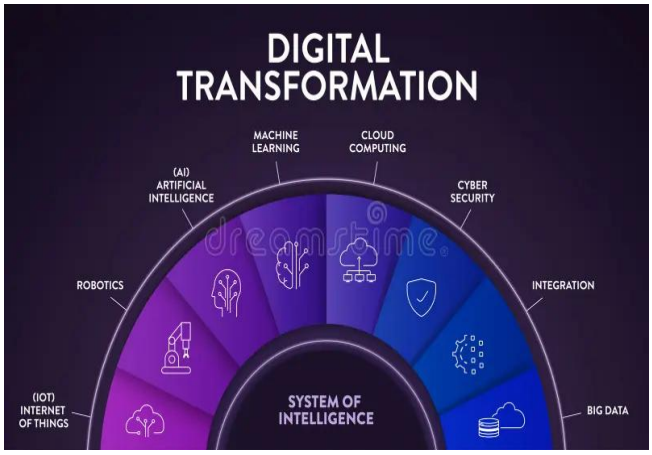

Fig 4 : Digital Transformation diagram infographic banner with icons vector has artificial intelligence, cloud computing, the Internet of Things, data analytics, cyber security, machine learning and robotics

The first of these principles leads businesses, before committing too much to DT investment in any of the new Digital channels, to dedicate resources to the strategy work of conducting in-depth exploratory analysis of the characteristics and DT budgets of their Customers Segments, of the Value proposition Importance-Performance matrices of each one of those segments, and of the ecosystem Value-net of each Customer segment as well, to help confirm or reject hypotheses about Digital channel needs for such segments and for the Value propositions directed at them. They should identify to which existing Customer Relationships (CRs) Value propositions currently being delivered through traditional channels relate and update their Customer Value Model accordingly. This will assist with the understanding of how much consumers expect to 'Disintermediate' or 'Intermediated Access' in terms of Total Cost of Ownership by use of those channels as compared to construct the value gained by experienced service chain Value Add / Loss at both User and System levels. Such exploratory analysis should seek to elaborate and activate consumer attributed Value hypotheses to Digital channels, which will subsequently provide the basis for banding consumers into different Digital channel DT categories, thus facilitating preparation of DT Budget Estimates for the different consumer segments.

7.2. Technology Selection

The second dimension, technology selection, is typically described by the content of the service offer and the infrastructure. Infrastructure could be seen as the technology enabler of the service offer, and encompasses technologies such as the cloud, integration middleware, and low-code development platforms. The cloud constitutes the technology enabler, where the service organization is built. Integration middleware creates a push-and-pull integration framework between customers and the service organization, allowing for orchestration of non-digital interactive processes. Low-code development platforms create the technology enabler, where the content of the digital service interaction is built.

A rich and flexible selection of Low-Code applications is key to creating stickiness and customer retention. The content of these applications illustrates a creative digital experience, while the Low-Code platform allows a fast copy-and-paste deployment by the service organization. The availability of such a selection will be key to consumer-driven digital transformation. AI is the big question. Service organizations have used Robotic Process Automation to democratize electronic data exchanges with the business-to-business chain, and what matters now is to facilitate that democratization for the business-to-consumer chain, to deliver interactivity in service consumption. Lately, generative AI is becoming an enabler to deliver Tailored Interactive Services in Marketing, Sales, and Service. Tailored Interactive Services offer content that is personalized in the course of service consumption by digital assistants, and helps the service organization build customer intimacy and long-term attachment. But, the jury is still out. One of the clear lessons that we learn from the technology selection dimension is that the infrastructure is only one of the two pieces that matter in digital transformation.

7.3. Change Management

Introduction of significant changes within an established organization may be resisted by powerful stakeholders. In cases of consumer-centricity orientation, these will be management functions that may be the strongest opposers of the required digital transformation, as the silo organizational structure would require serious modifications. Therefore, the most painful process for large enterprises will usually deal with change management. Often companies recruiting an external partner to support implementation phases do not understand the amount of effort required to perform correctly the initial activities for a digital transformation, and they have been clear about how to manage the organization and the people.

The difficulty to change organizations, mostly when these lack digital culture, and the inexperience in external partners that assist them to do it result in early termination of transformation projects. Companies must communicate their strategic vision with clarity, teach and train employees on new skills to understand technology requests, and reward average and outstanding performance for processed results. Digital transformation decisions are usually strategy-oriented enough, and involve, or should involve, top management. However, actual operation of the transformation and management of its consequences should be shared by line levels, to reduce the risk for the organization to fail again. Therefore, a clear and simple structure of escalation should be defined, with the involvement of all key people dedicated to the project from both the customer and vendor sides.

Line management is also responsible for precautionary actions and decision a few days before implementation, to avoid serious stress in the organization and to facilitate the required changes in behavior and collaboration. After implementation, top management must monitor that most of the efforts are not flatched, as usually occurs. Structuring the organization in order to identify and reward key line players is indispensable, as they know better than market consultants the idiosyncrasies of people and operations.

8. Measuring Success

To avoid wasted resources and effort, organizations must be cautious in selecting appropriate Key Performance Indicators (KPIs) for measuring digital transformation success. True success in transformation should consider measurable results on competing and consumer-centric service experiences themselves, not just the supporting factors or means, such as measuring product revenue and usage. Examples of product-facing experience indicators include first call/visit resolution, total interaction and support channel effort, time-to-value, and customer satisfaction scales. Success in customer-centric design of experiences should include repeat purchase ratios, brand ambassador and advocate loyalty engagement, service experience narratives, and Top-of-Mind awareness. In developing a Customer-Centric Digital Service Framework for a leading healthcare insurer, one team used a mature digital engagement metric that included interaction and merge metrics among branded portals, microsites, and emails while including channel mix proportions for email, website, chat, IVR, and contact center. They also included supplements that considered demographic adoption, had meaning for the stakeholders and supported the digital service vision. Indeed, clever metrics can become enablers of transformation rather than just milestones to check against, driving digital strategy while the transformation is underway.

The concerned benchmarks are available for many industries, including retail and health. Their extensive surveys include customer research metrics—consumers' perceptions of and the importance of company branding, quality of product, pricing, customer experience, process, and service metrics, company and category share of wallet ratios, and Net Promoter scores across all channels. If not done, including a refresh of quantitative experience and pricing research might be in order organizations. Companies might find it difficult to secure stakeholder buy-in for these new direction-changing metrics. As a partial solution during the evolution, some industry benchmark metrics might suffer the lack of unique identification reported to the media or to detractors and the potential detractors could start as supplements. Organizations should also have an informal direct feedback mechanism about digital engagement utilize, effectiveness, satisfaction, and difficulty that consumers are experiencing. It could include an outreach to customers and prospects regarding their liking of using or attempting to use, and the difficulty they encountered while using. One could also do some focus group research for design guidance.

8.1. Key Performance Indicators (KPIs)

The question of measuring success has different implications in traditional companies as if compared with companies oriented towards digital transformation and service orchestration. In traditional organizations, various units are involved in measuring success and profitability. In fact, most success measures are unit-related, such as revenue, market share, advertising expenditures, or ROI. However, activity models enable the identification of such costs and cash flows at a much deeper level. In a customer-oriented model, we could look at such costs and cash flows over the customer life-cycle to also identify the profitability of retention and acquisition. Specifically, activity modeling may show how much of a customer's total enjoyment or use of a service, if feasibly measurable, correlates with the activity costs incurred. This correlation can assist designers in allocating service costs in a way that enables success for both the service provider and the customer.

Shareholder expectations on organizations have rapidly evolved from focusing mainly on short-term measures like earnings per share to a more balanced assessment against a range of financial and non-financial KPIs. This shift has paralleled a changing relationship between organizations and their providers of capital. However, traditional financial reports are still dominated by the use of conventional KPIs revolving around pre-tax earnings, expense control, net earnings, and return on capital employed or shareholders' equity. Furthermore, it also illustrates the severe limitations of public capital announcements in shaping the expectations of current and potential future shareholders. In this broader context, the concept of Value-Based Management has emerged, which has extended these ideas to a wider audience. Within a VBM framework, the aim is to identify those financial KPIs that are predictive of a future increase in shareholder or even stakeholder value.

8.2. Feedback Mechanisms

Prior to taking any action to adapt services, organizations need to understand how well services are performing and how successfully they are meeting the needs, desires and expectations of consumers. To understand this, organizations should gather consumer feedback on their impressions of services, particularly on services that are underperforming or experiencing high levels of consumer exit. Surveys, mobile and web apps, customer comment cards and consumer focus groups can all be valuable sources of feedback mechanisms.

When creating a feedback mechanism, the first task for service designers is to ensure that the feedback options will capture the information needed about service quality performance. Feedback should be collected on at least three key aspects of service quality: service effort; performance expectations, perceptions and experiences; desired outcome(s); experienced outcome(s); and overall satisfaction with the service.

Additionally, it is important to establish how frequently consumers will be prompted to provide feedback about the services they experience. Striking a balance is critical, as service feedback requests that are too frequent may irritate consumers and compromise the service experience, while requests that are not frequent enough may not capture important fluctuations in service quality and performance, or changing consumer expectations and outcomes as these will have a major influence on levels of consumer current state satisfaction. If feedback mechanisms are triggered too often, it would be appropriate for the service consumer not to be prompted for other feedback requests during a specified period.

8.3. Continuous Improvement

Consumer-centric digital transformation is an ongoing process that requires organizations to continually assess and improve the experiences they provide for consumers. Key performance indicators (KPIs) and customer feedback mechanisms help organizations assess the effectiveness of the current digital services ecosystem and how well it is achieving its intended outcomes. For this reason, the data collected and analyzed from KPIs and feedback mechanisms must be leveraged to initiate and sustain the improvement of the digital services ecosystem. The simplest efforts might be something as basic as changing an outdated image or text on a service website. But the most impactful efforts are those that use the data collected to guide teams in the evaluation of the ecosystem and initiation of significant enhancements.

The results achieved using the ecosystem, as indicated by KPIs and feedback mechanisms, are often initiated or influenced by decisions made as a result of the data provided. Ongoing qualitative case studies and structured interviews with consumers can help organizations recruit consumers to educate design, development, and orchestration teams on the experiences that consumers expect from the brand. These consumer teams can then be leveraged as partners in the ecosystem improvement process. Further, end-to-end service orchestration will continue to evolve and improve as consumers learn to efficiently choose, configure, and automate their service interactions. The use of AI tools continues to allow organizations to replace longer, more frustrating, and more expensive effort interactions with simpler and faster calculations. Digital services ecosystem improvement does not have to be only add-on activities to existing ecosystems. It can also be resourceful enhancement activities that lead to new services creating considerable new profitability streams. By designing an agile, principled, and thoughtful operating approach, organizations can prepare for sustained release of high-quality improvements and new functionalities.

9. Future Trends in Digital Transformation

We can see emerging technologies such as Generative AI and Service Orchestration changing the way consumers interact with brands and how businesses take decisions internally as well as on the client's behalf. Generative AI, with its capacity to reduce and assist in different creative processes, these online identity construction, company simulation and role representation will allow each of the consumers to receive tailor-made information, accessible by any means that will, of course, satisfy this same user. He will thus travel through the advertising and commercial policy of the company, but without having asked for it. The interconnection of services will result in considered recommendations adapted to the needs of each one. Using AI as a co-pilot in our business functions will allow employees to focus on value-added tasks, thus enriching the client-employee relationship and strengthening the companies' service value proposition policy.

Fig 5 : Digital Transformation

Here again, the sale of value-added digital products that have an impact on all actors and the entire work chain of the companies will encourage brands to use technology-enabled tracking tools that will reinforce links between the brands and the consumers, improving the user experience as long as they uphold the rights to the protection of personal data and privacy: a service orchestration system. They will act as a real Business Intelligence Unit by gathering, analyzing and processing information regarding the use and consumption of its digital products, generating monitoring reminders, enhancing the relationship with each of the customers by offering them new digital services in line with their activity. Such an ecosystem would be able to offer business innovation solutions tailored to measurable growth objectives. Businesses that will have made Digital Transformation a real strategic axis will become patterns that the rest of the organizations will be inspired by.

9.1. Emerging Technologies

Digital technologies are evolving rapidly and there are arguably too many technologies that could be included in a discussion around the future of digital transformation. Digital transformation cannot occur using only internal organizational capabilities such as digital infrastructure or core digital technologies. These are core internal components but the challenge of digital transformation is in combination with existing services and external ecosystem service components. Here, we will focus on several particularly potent external technologies that track toward enabling or disrupting consumer services and, in turn, consumer-centric digital transformations.

Augmented reality, combined with AI empowers the consumer. The smart phone is a piece of advanced technology but it has not fundamentally re-envisioned the consumer experience. Advances in augmented reality push toward real-time AR experiences that eliminate the issue of a second device being needed. Mass adoption may still be years ahead but we are starting to see early use cases, especially in retail. AR could be used to show bespoke virtual hologram tweaks to the visual appearance of items on the fly – and over video chat with my friend. AI will help with inspiration, suggestion and creating a realistic use case images. But if consumers can instantly experience purchasing decisions and share those purchase-path experiments with friends, and why wouldn't they do this – it becomes incredibly addictive. Similarly, AR apps on mobile will make it feasible to show people how really expensive surgical procedures will look in a lot more detail than a brochure or even high-definition video. It would seem worthwhile for the service provider to invest in the enormous upfront cost of creating the AR apps.

9.2. Predictions for Consumer Behavior

The digitalization of life is reaching critical levels on many fronts and this digitalized economy and society is starting to irreversibly influence the lived and anticipated consumer experience and overall customer journey. Consumers are demanding faster responses to their feedback and input but accustomed to only limited ranges for many products are going to be less patient with these limitations that can also barely influence their common experiences of a product or a service offered in such platforms, especially as becoming more diverse lifestyles and more exotic consumption that made peoples' identity are not stimulated and addressed anymore. Consequently, there will be an increased demand for more customer- and people-centric services that can anticipate changes in needs, for example customized recommendations. Furthermore, consumers seem to get used to instant evaluation input possibilities by simply posting on social networks and messaging apps and with that are starting to change the model of customer journey touchpoints influencing their experience and future purchases.

More individuals add more types of relationships and consumers are starting to expect evolving possibilities, service concepts, and touchpoints providing digital-stress-free communications and truly consumer-centric recommendations. The future of the consumer-centric customer journey will be focused, seamless, and personalized. All types of consumers expect instant connectivity, up-to-date information, and predictive intelligence throughout their interaction with brands, products, and services. To nurture these relationships that can help brands be digital-stress-free, hyper-personalization, and predictiveness are key requirements.

9.3. The Evolving Role of AI

The notion of enterprise digitalization has been around for a while. Overall, the intentionality behind these digitalization plans has often been more centered on the interest of the business rather than on that of the customer. For true consumer-centric digital transformation, made possible by the leveraging of customer intelligence, the enterprise must become an enabler of consumer success through digital means, helping consumers to achieve their objective in a way that they see fit, towards the service orchestration goal, and artificially intelligent systems can help a lot in the smart digital customer experience design.

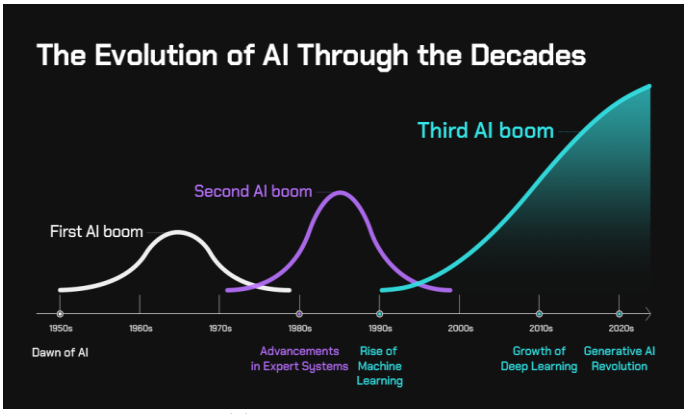

Fig : All About AI The Origins, Evolution & Future of AI

Artificial intelligence has been part of enterprise IT stacks for a while now and for some time it was mostly relegated to advanced use cases due to hardware availability, model efficiency, algorithm sophistication, and data quantity and quality. Due to the availability of large tech company cloud AI platforms, also thanks to the arrival of large language models, now the bar to experiment AI in business on potentially many more use cases is much lower. Companies are interested, especially about generative AI and individual companies have to find use cases and evaluate yields, on projects and potentially on other companies, which will bring them competitive advantages. It is to be expected that some will excel, while other investments will flop, and there will be a new wave of AI startups and scale-ups that will augment the IT service business for the orchestration of enterprise business models in a more AI-enabled services management way. Some companies, especially in the media space, are already experimenting with generative AI in a creative production capacity. In marketing and other customer-facing functions, also tech companies are also investigating ways to improve customer experience with a tailored strategy with the help of generative AI.

10. Ethical Considerations

The rapid advancement of service orchestration and AI technologies has raised ethical considerations in the digital transformation of consumer-centric businesses. These technologies are built on digital ecosystems, which require a platform-based approach to enabling the emergence of interactions and relationships among all the actors sharing data in a dynamic environment. However, not all consumer-centric businesses are oriented towards helping consumers. Moreover, researchers note that businesses do not focus on the increasing consumer interdependence when preparing for their digital transformation, as it is not in their immediate interest. They focus instead on controlling their business operations and make decisions solely based on their own interests.

These features of the digital transformation of consumer-centric businesses represent obstacles to the ethical use of service orchestration and AI technologies, as the stakeholder theory of business ethics emphasizes that businesses should be aware of all the stakeholders affected by their operations, including consumers, and act in the interest of their stakeholders. The aim of this chapter is to search the foundations of an ethical digital transformation of consumer-centric businesses enabled by service orchestration and AI technologies. In line with the stakeholder theory of business ethics, we analyze the three ethical topics of consumer data privacy and security, consumer trust, and the responsible use of AI. These ethical topics could support the digital transformation of consumer-centric businesses, allowing them to both better reach their consumers and be more effective in their interactions.

10.1. Data Privacy and Security

Consumer data is typically processed within an organization, but with increased outsourcing and sharing of customer data with other parties, understanding where the data physically is in the platform is increasingly difficult to determine. Data can be electronically transferred to other parties or physically moved to other environments that lack the heightened security traditionally required for on-premise or ERP databases, or the data might itself be inadequately protected. These conditions can violate the security policies of both the customer and the service platform, creating legal risk for the platform. Moreover, the technical, legal, ethical, and regulatory considerations surrounding customer data privacy are constantly changing and often differ dramatically across countries. Essentially, organizations must ensure that their services comply with the data privacy laws of the countries in which the service is physically operating. No easy task, especially for services that utilize AI algorithms trained on the provision and consumption of millions of unique users across many countries.

Even when an organization thoroughly researches and manages the legal considerations surrounding privacy, it can still unknowingly create expressions and uses of the service that inadvertently diminish a customer's expectation of privacy. For example, although many data protection authorities have provided guidelines detailing what companies need to do to demonstrate robust data privacy and security practices, including how to ensure that customer data cannot be used to identify a user, relatively few organizations create services that include privacy-impact assessments in their development guidelines.

10.2. Bias in AI Algorithms

"Bias is a natural outcome of the data preparation process itself, whether that bias emerges through sampling methods or by virtue of the pre-existing prejudices present in the historical datasets from which algorithms learn. Because algorithms learn from historical data, whatever marginal errors or sampling bias might have been present in the original data is likely to perpetuate patterns of existing discrimination. Hence it is important to be very careful when creating datasets as they often are used without analysis of their potential flaws." A consequence of these data preparation processes is that it can take an extended period for algorithms to discount these biases once refreshed datasets are input. The unfortunate consequence of this state of affairs is that because algorithms are trying to predict probabilities based on learning from available historical data, they are likely to learn biases from it which can perpetuate existing business outcomes without adequately discounting the inequities reflected in those business outcomes. These biases can persist well beyond the refresh frequency for algorithms. For example, if crime data and airport usage data reflect biases which there are clear business reasons for removing, these biases may remain entrenched for years or decades, waiting to finally be discounted with a full set of data samples, and thus create inequitable actions in the operation of the AI algorithm. We must keep in mind that algorithms do not "understand" economic or cultural reality, and are like very dumb "super-experts" about the areas they're trained on. When patterns of economic and cultural activity conceal biases, algorithms do not normally question the impartiality of such patterns, instead continuing to predict biased behavior into the indefinite future. Bias is a natural outcome of the inherent goal of algorithms, which is to learn from available data." The possibility of bias within algorithms generated by AI is a significant and long-standing issue in the field of AI.

10.3. Consumer Trust

Because service orchestration relies on the collection, storage, and analysis of vast amounts of consumer data, any data privacy or security issues that could arise have the added potential to hurt consumer trust in service orchestration all the more. Consumer trust in service orchestration is essential to move consumers from digital or automation aversion to trusting that such capabilities will improve their consumer journey. The emerging discipline of service orchestration relies on building up consumer trust - equivalent to the trust that people have in a personal assistant - and creating interfaces that are simple, predictable, and controllable. When orchestrating services, AI can shape the user experience via influence as much as fulfill requests via control. When AI is woven into systems as invisible architecture, users simply assume their needs are understood. Consequently, organizations take the decisions and actions that users would want to do or take, if only they could take the time to do the thinking, remembering, and deciding. Embedded agency and inference rules can be built to proffer content and recommendations that users would choose on their own, thus saving the user effort. Accordingly, while there may be a temptation to strip knowledge workers of autonomy and turn everything over to intelligent automation, such a strategy could backfire. Ironic as it may seem, the greater the degree of AI and automation's agency, the greater the risk of incurring user resentment and overcoming expectation gap, which would erode consumer trust in responsive systems. Thus, AI needs to establish and maintain a delicate symbiosis with consumers in which it is at one time promotor and executioner of choice. Therefore, a challenge for service orchestration, and the AI that supports it, is creating intelligent but invisible experiences.

11. Conclusion

In this chapter, we discussed various use cases of consumer-centric digital transformation at different levels of maturity and identified service orchestration and AI automation as the glue to achieving this transformation. We examined how service orchestration and AI could reduce pains and increase gains by addressing specific consumer jobs. All these value co-creation at different levels must be done while preserving the service ecosystem's governance health, measured by consumer and other stakeholder trust. Mapping business services to consumer jobs and testing value co-creation scenarios mapped to ecosystem governance health are essential prerequisites to orchestrating synchronous service delivery and collaborating ecosystem partners. A compelling vision of digital transformation is a "completely customer-centric organization" where everything is orchestrated around the customer. However, we have found that most existing digital transformation is just improving back-end efficiency with little focus on the customer. Therefore, a critical checkpoint is whether a given type of digital transformation is genuinely consumer-centric or internally focused, i.e., "none or bad" orchestration. Service orchestration and AI-assisted automation can help organizations avoid such pitfalls. It is imperative to adopt a consumer-centric view of digital transformation and ask how the service-based infrastructure will help achieve that blueprint. After that, rethinking APIs and using orchestration and automation tools would be less of an internal technical architecture exercise and more of an activity supporting the consumer-centric vision of the organization. We conclude that such a consumer-centric approach to digital transformation is possible only with a sustainable collaborative ecosystem of businesses. These businesses orchestrate to help consumers achieve their jobs to be done and deliver joint customer value. Otherwise, the transformation is limited to optimizing an organization's internal processes, leading to a dead-end, for example, in the insurance and banking industries, where customer churn is rising.

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