ISB CTO

Week 2: CTO as Strategy Catalyst

One of the crucial roles of the Chief Technology Officer (CTO) is that of a strategy catalyst. But what exactly does this mean? What specific skills and knowledge does a CTO need to possess? And how can they contribute to an organisation as a strategy catalyst? In this discussion, we will explore these questions and provide relevant examples to contextualise this role.

Digital Transformation: Examples

To better understand the role of a strategy catalyst, let's consider a couple of examples. Best Buy, a traditional brick-and-mortar retailer specialising in electronic equipment for the home, faced an existential threat from the rise of internet-based businesses like Amazon. Realising the need for transformation, Best Buy embarked on a journey to become a modern digital retailer. Through their Renew Blue strategy, Best Buy successfully transitioned from a traditional brick-and-mortar retailer to a digital omnichannel retailer.

Another example is Asian Paints, a longstanding paint manufacturer that primarily relied on B2B distribution channels. However, Asian Paints underwent a digital transformation, positioning themselves as a data science company that not only sells paints but also assists customers in finding décor solutions for their homes and apartments. By repositioning themselves in this way, Asian Paints gained market share and became a modern company appealing to the millennials and the digital generation.

These examples highlight how companies recognised the threats and opportunities presented by digital transformation, digital strategy, and innovation. The success of such endeavours is often closely tied to the role of the Chief Technology Officer (CTO). In this context, we will delve into understanding the role of the CTO as a strategy catalyst.

Key Considerations for Aspiring CTOs

If you aspire to become a CTO and serve as an effective strategy catalyst, it is essential to acquire specific knowledge and skills. Topics to be explored include understanding the digital economy, recognising the challenges and opportunities it presents for disruption and innovation, and comprehending the dynamics of new partnerships within the emerging digital ecosystems. Additionally, grasping competitive moves for success is vital to drive digital strategy and innovation forward.

Digital Economy

There exist numerous ways to define the digital economy, yet at its core lies the increasing prominence of a wide range of technologies. These technologies, such as the cloud, facilitate seamless information transfer between different locations and devices, enabling a state of constant connectivity.

Role of Cloud

The cloud serves not only as a connectivity tool but also as a vital resource for data storage. In an era characterised by vast amounts of data, often referred to as big data, there is a pressing need to store this data efficiently. The cloud provides a solution to this data storage challenge, enabling the handling of massive volumes of information with ease.

Impact of Social Media Technologies

In today's world, social networking and collaboration play significant roles. The increasing prominence of social media technologies has created a plethora of opportunities for social commerce, an integral component of the digital economy. Additionally, platforms have emerged to facilitate content creation, commercial transactions, and connections among individuals. This evolution has given rise to new forms of collaboration between companies, all aimed at meeting the diverse needs of customers.

The Foundation Technologies (SMAC + IoT)

At the heart of the digital economy lie a group of foundational technologies. These include

- **Social technologies** such as Facebook and Twitter, which foster social connections.
- **Mobile technologies**, such as smartphones and tablets, that have further facilitated the digital transformation
- **Analytics software and engines**, the rise of which has enabled organisations to extract insights from vast amounts of data
- **Cloud services** like Amazon's AWS, Azure, and Google solutions that have experienced widespread adoption, leading to the migration of infrastructure from company premises to the cloud.

The integration of these technologies with the Internet of Things (IoT) completes the framework. Collectively, they form the foundation of the digital economy, often referred to by the acronym SMAC plus IoT.

The digital economy is a dynamic landscape that constantly evolves. Notably, the growing enthusiasm surrounding wearables exemplifies the ongoing innovations in mobility. As technology continues to advance, the social, mobile, analytics, cloud, and IoT framework remains fundamental in understanding the digital economy and its potential.

Drivers of Digital Economy

Moore's Law: Computing Capacity Doubling

Over 30 years ago, Gordon Moore predicted that computing capacity would double every 18 months. This prediction has held true, leading to exponential growth in computing power. The transformation is evident when comparing the room-filling

mainframe computers of the past with today's smartphones and smartwatches, which possess far greater computing capacity. This exponential growth has made massive computing power accessible to users, enabling access to vast amounts of information.

Metcalfe's Law: Exponential Growth in Connections

Metcalfe's law explains the exponential growth in connections and the value derived from networks. With two telephones, there is only one connection possible. However, as the number of telephone owners increases, the number of possible connections grows exponentially. Social media platforms such as Facebook and Twitter exemplify this phenomenon, allowing millions of users to connect and engage in social commerce. Metcalfe's Law showcases the rise of social connections and the explosion of social media.

Bandwidth Law: Liberating Data Transmission

The bandwidth law highlights the evolution of data transmission capabilities. In the past, data could only be transmitted through narrow band networks, resulting in slow transfer rates. Today, with 5G networks and increased bandwidth, multimedia content, including images and videos, can be seamlessly transmitted to smartphones. This transformation has revolutionised various aspects of daily life, including shopping, where individuals can browse product images and make purchases without visiting physical stores.

Waves in Digital Economy

Within the dynamic landscape of the digital economy, we have witnessed a continuous stream of technological innovations. To make sense of this phenomenon, we can categorise innovation into waves, each characterised by distinct sets of technologies.

First Wave

The first wave comprises of foundational technologies, mobile technologies, analytics and cloud.

Foundational technologies

These are an integral part of the first wave. Among these social technologies such as Facebook and Twitter have

- Revolutionised social media engagement
- Connected customer communities, where word-of-mouth holds as much influence as traditional advertising

Companies can now leverage this social connectivity to foster collaboration among designers worldwide, leading to a new approach to R&D and innovation. Additionally, businesses are recognising the potential for crowdsourcing, tapping into the innovative capabilities of their customers.

Mobile Technologies

The emergence of these technologies is another crucial pillar of the first wave. This has opened up new business innovation opportunities, such as

- Micro-moments which involve creating impulsive purchases through geotagging, geo-sensing and geolocation
- Hybrid work and virtual collaboration that impact talent management and the treatment of employees
- Creation of seamless omnichannel experiences for customers
- Integration of in-store, online and app-based interactions
- Advent of augmented reality that has transformed customer experiences

Analytics

Analytics empower businesses to gain deeper insights into their customers, employees and suppliers. This newfound intelligence derived from data has led to the rise of search engine optimisation and innovative marketing and advertising strategies.

Cloud

The Cloud has enhanced business agility, enabling companies to follow their customers rather than expecting customers to follow them. For instance, imagine seamlessly transitioning from watching a movie on an app on your TV to continuing it on your mobile phone while outdoors. The power of the cloud makes this seamless transition possible, opening up new avenues for product innovation and customer relationships.

Second Wave

While the first wave of digital technologies, including social, mobile, analytics, and cloud, were undoubtedly significant and influential, they primarily focused on connecting people to people. For instance, mobile phones facilitated communication between their owners, and social technologies enabled interactions among individuals. However, a substantial sector of the economy, known as the physical economy, remained outside the realm of these technologies. This sector encompassed physical artifacts such as cars, homes, refrigerators, washing machines and even billboards displaying advertisements.

To achieve a comprehensive digital economy, it was essential to bridge the gap between the digital and physical realms. This is where the second wave of technology made a significant difference.

The second wave introduced the concept of the Internet of Things (IoT). While the precursor to IoT was the RFID (Radio Frequency Identification) sensor, its capabilities were limited. The advent of IoT transformed physical devices into smart devices, enabling their connection and integration into the digital ecosystem.

The second wave extended the connectivity beyond people-to-people interactions observed in the first wave.

- It enabled **people-to-object connections**, linking homes, cars, refrigerators, and other physical artifacts to individuals.
- **Object-to-object connections** became possible, allowing devices like refrigerators and washing machines to communicate with each other or with external systems such as utility companies.

This convergence opened up a wide range of possibilities for innovative products, services, and experiences such as:

- **Wearables:** These devices, equipped with smart sensors facilitate connections between individuals and their devices. The second wave essentially merged the physical and digital worlds, enabling seamless integration and transformative opportunities.
- **Dynamic and intelligent billboards:** The second wave enables the transformation of static billboards into intelligent billboards. By leveraging IoT capabilities, these billboards are able to detect individuals and tailor advertisements based on their preferences. They become dynamic platforms that offer personalised content, enhancing the effectiveness of advertising campaigns.

The New Digital Reality

This can be described as what is out there in terms of technology trends and uses that influence digital innovation, which in turn influence the need for rethinking business strategy. Some of the new elements of the digital reality can be summarised as follows:

Big data analytics and artificial intelligence

- Marketing managers employ behavioural segmentation and gain insights into sentiment and purchase behaviour.
- This enables smarter decision making and personalised recommendations, revolutionising market segmentation.

Social web

- Introduces new forms of customer-firm interactions and influences attitudes and consumption behaviours.
- Firms can leverage social media intelligence to capture consumer-to-business (C2B) messaging.
- Consumers express their sentiments on social media, allowing companies to gauge brand perception and customer experiences.
- Consumer-to-consumer (C2C) interactions on platforms like Facebook and Twitter
  - Contribute to a deeper understanding of customer sentiment
  - Play a significant role in marketing and customer relationship management

Mobile apps and Cloud computing

- Powerful platforms for delivering services to consumers
- Offer personalised information, product preferences, and convenient payment options.
- Redefined the customer interface, with companies like Starbucks enhancing customer interactions through app-based ordering and loyalty rewards.

Internet of Things (IoT)

- Connects products through sensors and software, enabling advanced functionalities. For instance, cars equipped with telematic services can track maintenance needs and automatically schedule servicing, streamlining the customer experience.
- IoT-driven services make customers' lives easier and contribute to a more efficient and convenient product usage.

Robotics, drones, and 3D technologies

- Are shaping the supply chain landscape
- Offer quick and efficient order fulfilment
- Disrupt traditional trucking and logistics industries

Augmented and Virtual reality

- Enhance customer interactions and product discovery.
  Examples: Customers can virtually tour homes, try on clothing, visualise furniture in their own space, and experience virtual test drives.
- Offer endless possibilities for immersive and engaging customer experiences,
- Transform the way customers engage with products and services.

Competing in the Digital Economy

There are three dimensions or rules for competing in the digital economy. Today firms must position themselves to compete along scale, along scope, and along speed.
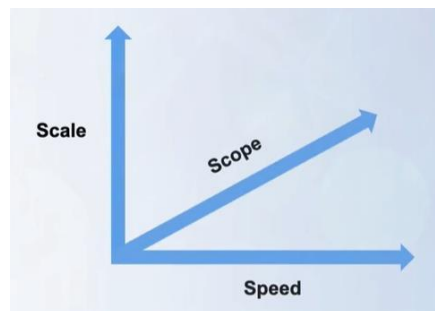
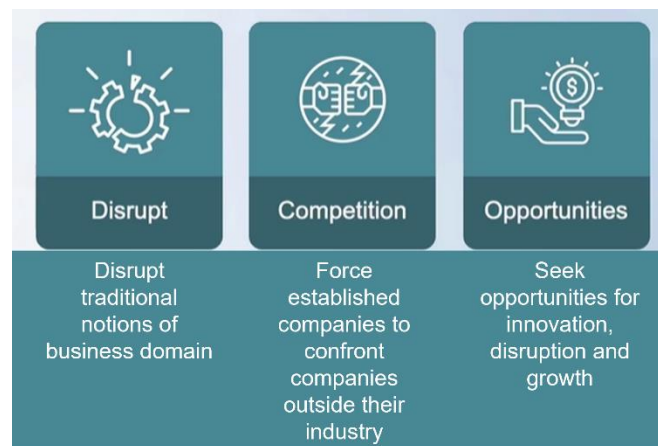Let's look at each of these concepts with examples

Scale

- Refers to market share or customer penetration.
- Examples:
  - Google's dominance in online searches, with 80% market share in online advertising
  - Uber's exponential growth to 3.9 million drivers and delivering 7.6 billion rides annually
  - Airbnb's ability generate is more than four times the number of room bookings made by the rest of the hotel industry

- Provides valuable customer insight, making it crucial for companies to aim for dominance in their respective markets.

Scope

- Refers to the number of industries a firm competes in
- Examples: Digital giants like Apple, Google, and Amazon have expanded their reach into multiple industries
- Enables some companies to become cross-boundary disruptors

Disrupt	Competition	Opportunities
Disrupt traditional notions of business domain	Force established companies to confront companies outside their industry	Seek opportunities for innovation, disruption and growth

Speed

- Measured by time to market and the ability to adapt quickly
- Trumps perfection, as customer needs evolve rapidly
- Focus on quick product launch and leveraging customer feedback to continually innovate and refine.
- Can be achieved by strategies such as
  - Open innovation
  - Customer involvement in the design process
  - Strategic A/B experimentation
  - Experiments with different versions

The digital economy has rewritten the rules of competition, necessitating a focus on scale, scope, and speed. Companies must aim for dominance in their markets, compete across industries and embrace agility and innovation. By understanding and adapting to these new rules, businesses can navigate the dynamic digital landscape and remain competitive in the ever-evolving digital economy.

Defining Business Strategy

In light of our understanding of the digital reality and the new rules of competition, it becomes essential to redefine business strategy. It is worth contemplating the nature of business strategy and its components. Commonly, business strategy encompasses considerations such as customer focus, differentiation, mission, vision, values, and resource management. While these aspects hold merit individually, let us now redefine business strategy by focusing on two concrete ideas:

- Business strategy should centre around achieving scale, scope, and speed. This entails a deliberate effort to expand operations, broaden the range of offerings, and maintain agility in responding to market demands.
- There is a need to envision or reimagine business strategies based on customer needs rather than being solely product- or service-centric. By shifting the focus towards understanding and fulfilling customer requirements, businesses can foster stronger connections and drive long-term success.

Illustration: John Deere's Transformation

To illustrate the redefined business strategy, let us consider the example of John Deere, a company with nearly a century of experience in manufacturing agricultural equipment. Operating across multiple countries, their equipment can be found on numerous farms.

Historically, John Deere was synonymous with farming. However, as global competition emerged, primarily from Asia with lower cost structures, John Deere encountered challenges in sustaining its competitive position, given the limitations of price-based competition. In response, John Deere underwent a process of self-reflection. They realised that their previous perspective positioned them as sellers of agricultural equipment. Their strategic definition revolved around being "in the business of making and selling agricultural equipment."

However, a pivotal insight emerged during this contemplation. John Deere recognised that they held a wealth of knowledge about the farmers they served, enabling them to establish a position of trust. They possessed valuable information regarding farmers' land holdings, weather conditions, and soil characteristics.

With this realisation, John Deere decided to redefine their business beyond the mere sale of tractors. Their new vision involved becoming the trusted advisors to farmers, shifting their focus towards comprehensive farm management and consider the holistic needs of farmers.

They identified three elements in farm management to focus their strategy on, weather, seeds and irrigation.

Weather

They acknowledged that weather played a critical role in farm productivity and yield. Unfavourable weather conditions such as excessive heat or rain could lead to crop losses. Understanding this vulnerability, John Deere

- Recognised the significance of weather data and its implications for effective farm management.
- Explored opportunities to provide farmers with
    - Intelligence on weather patterns, weather maps, forecasts
    - Sensors for rainfall, humidity, and temperature.

These were services they had not previously considered, but which held tremendous potential.

Seeds

John Deere identified another crucial element in farm management: seed optimisation. The effectiveness of seeds relies on various soil conditions, including acidity and dryness. To assist farmers in this regard, John Deere aimed to

- Offer information through seed databases and farm performance data.
- Enable farmers to customise seed selection and treatment to optimise performance on their specific plots of land.

This domain traditionally fell within the realm of agricultural scientists, a field distinct from John Deere's expertise.

Irrigation

Proper irrigation plays a vital role in farm productivity. Balancing the need to conserve water while providing the right amount at the right time posed challenges. John Deere recognised the importance of irrigation optimisation. They began integrating field sensors, irrigation nodes, and irrigation applications to enhance water management strategies.

Reimagining the Business

Through this transformative process, John Deere realised that manufacturing agricultural equipment represented only one aspect of their offerings. While it served as an initial point of entry into the farmer's world, it presented an opportunity to redefine their business around farm management. By expanding their services to include holistic advice on weather, seed optimisation, and irrigation, in addition to providing equipment, John Deere positioned themselves as invaluable partners to farmers.

John Deere's historical advantage in scale, having served the largest number of farmers, afforded them a wealth of intelligence and insight. This knowledge surpassed that of their competitors. By redefining their business strategy to focus on farm management, John Deere effectively sidestepped concerns regarding price-based competition. This example exemplifies the new rule in today's business landscape.

The example of John Deere prompts us to reflect on our own companies. It is vital to consider the products we sell and services we provide. Are they the sole basis for defining competition? Understanding our customers and their specific needs is key. Exploring complementary consumption, or the additional products and services consumed alongside ours, can unveil opportunities for growth. By identifying and addressing customer pain points, we can strive to become trusted advisors, reimagining our businesses based on their needs rather than our products.

The Rise of Ecosystems

Having explored the transformative aspects of the new digital reality, the evolving rules of competition, and the imperative to reimagine competitive strategy, let us delve deeper into the practical application of these concepts. Is there a framework that can guide

companies in adapting to the new world order shaped by the digital reality? Are there specific questions that serve as catalysts for strategic thinking?

One fundamental question to ponder is the essence of your customer value proposition. A value proposition entails understanding

- Who your customers are
- How you serve them
- What unique qualities foster loyalty.

Building upon the customer value proposition, it is crucial to consider two categories of customer needs:

- **Delivered needs**
    - o Customer needs that incumbents in an industry operate around
    - o Example: Banks tailor their services to customers with established credit histories and steady incomes. They generally meet the standard needs of customers, such as banking and checking accounts, access to ATMs and physical branch offices.
- **Latent needs**
    - o Customer needs that incumbents consider non-profitable and do not serve
    - o Example: Banks generally do not cater to people with no steady income but need to do financial transactions

Disruption through identifying latent needs

To illustrate the impact of identifying latent needs, let us examine the disruption caused by Netflix in the video streaming industry which was dominated by Blockbuster with its convenient brick-and-mortar stores.

Blockbuster	Netflix
• Had stores that customers could walk into and pick their movie • Allowed customers to rent the movies for 24-72 hours • Imposed penalties for late returns of the rented moved to keep inventory moving • Stored only popular movies thus ignoring a niche customer segment	• Delivered movies to customers through mail • Delivered the top three movies from the customer's watchlist • Did not have any late fees so customers could watch movies at their own pace • Introduced the subscription model with a fixed fee

Sources of disruption

- Consumer dissatisfaction due to latent needs being ignored especially when they find their traditional experience to be stressful, intimidating, complicated and low trust

- Despite significant changes in consumer preferences, incumbents focus on delivering known needs leads to blind spots, leaving latent needs unaddressed.
- Altered consumption patterns and values due to the emergence of digital natives, represented by the millennial generation who prioritise environmental sustainability, purpose-driven business practices and innovative approaches to problem-solving.

To become a strategy catalyst in the digital economy, organisations must embrace the new digital reality, redefine their customer value proposition and uncover latent needs. By recognising the limitations of delivered needs and leveraging disruptive innovations, companies can stay ahead of the competition.

New Ecosystems

In the realm of digital strategy, it is crucial to consider the evolving landscape of disruption, latent needs, and delivered needs. In addition to these aspects, one must also recognise the significance of ecosystems as a strategy catalyst.

Every industry comprises three distinct groups of players:

- **Incumbents**
  - Traditional leaders who focus on fulfilling delivered needs
  - Example: Maruti in the automobile industry, Hilton and Hyatt in the hotel industry
  - May have blind spots regarding latent needs

- **Digital giants**
  - Limited set of tech companies
  - Example: Apple, Amazon, Facebook, Google, Netflix, Uber, Microsoft.
  - Possess exceptional capabilities in achieving scale, scope, and speed, primarily due to their substantial financial resources and access to top talent
  - Have the capacity to invest in experiments, embrace disruption, and take risks, thereby enabling them to address latent needs effectively

- **Digital entrepreneurs**
  - Start-ups initiated by individuals working for either digital giants or incumbents
  - Possess an understanding of latent customer needs and the imagination to develop innovative digital solutions to address them

Within every industry today, these three groups coexist, each playing a distinct role. Incumbents continue to hold their position as industry leaders, while digital giants disrupt the status quo through their substantial resources and talent. Simultaneously, digital entrepreneurs, driven by their understanding of latent needs and innovative ideas, emerge as influential players.

The Rise of Ecosystems

Contrary to the initial expectation that digital giants would displace incumbents, a different pattern has emerged. Rather than complete displacement, we witness the emergence of new ecosystems. For example, in the automobile industry, despite Google's and Tesla's early experimentation with autonomous and electric vehicles, respectively, the traditional automakers like Ford, GM, BMW, Audi, and Maruti have not been rendered obsolete. Instead, they have adapted by forging strategic partnerships.

Ecosystems have become the new rule of competition. In the automotive sector, this is evident as companies form alliances to offer enhanced services. For instance, Tesla's partnership with Ford, enabling access to its charging stations for Ford electric car owners, exemplifies the rise of ecosystems.

Identifying and collaborating with digital giants and tech entrepreneurs is crucial for launching experiments and innovations centred around latent needs, thus shaping the new landscape of strategy.

Competitive Moves for Success

Today, being a strategy catalyst entails the ability to educate, comprehend, and apply the rules governing new competitive moves for achieving success. Let us now delve into these essential rules:

- **Forming new ecosystems by identifying suitable partners**
  This entails recognising the potential collaborators who can contribute to the growth and innovation of your organisation. Collaborative partnerships enable the sharing of knowledge, resources, and expertise, ultimately leading to a competitive advantage.

- **Reimagining the business model around the customer**
  By amplifying the voice of the customer, you gain valuable insights into their latent needs. Understanding and addressing these unmet needs pave the way for innovation and differentiation in the market. Customer-centricity should be at the core of your strategic decision-making processes.

- **Leveraging the ecosystem for strategic experiments**
  This approach enables the exploration of latent needs within your target market. By embracing experimentation and continuously learning, you can identify new business opportunities that align with these latent needs. Such experiments foster agility, adaptability, and the ability to stay ahead of the competition.\

- **Leveraging the ecosystem to acquire new capabilities**
  Collaborating with partners who possess complementary skills and expertise can bolster your organisation's ability to innovate and address emerging challenges. This approach promotes growth through knowledge exchange, skill augmentation, and the cultivation of a dynamic network of talents.

To illustrate the importance of these rules, consider the example of Ford. Ford has leveraged its ecosystem to learn how to build smart cars, adapting to the changing

landscape of the automotive industry. Additionally, Ford has formed a partnership with Uber to gain insights into the behaviour of ride-sharing users. By expanding their focus beyond traditional car owners, Ford demonstrates an understanding of the evolving market dynamics and the importance of catering to various customer segments.

By embracing these strategies and leveraging ecosystems effectively, CTOs can position themselves as catalysts for driving strategic success, fostering innovation, and ensuring long-term organisational growth.