

# A theoretical Significance of improvising market performance in the digital economy

Jayadatta S

*Assistant Professor KLES IMSR*

*BVB Campus, Vidyanagar, Hubli- 580031*

*Research Scholar, KIMS, KUD*

*Email: [jayadattaster@gmail.com](mailto:jayadattaster@gmail.com)*

Dr. Shivappa

*Professor & Research Guide*

*Kousali Institute of Management Studies*

*Karnatak University Dharwad -580001*

*Email: [shivappakims@gmail.com](mailto:shivappakims@gmail.com)*

## Abstract

*We are well aware of the fact that the digital economy has considerably and substantially reduced market frictions and has also posed new challenges for efficient functioning of various markets. Also in particular the seaming drastic reductions in costs of search, transportation, entry and reproduction all have sound and profound implications for the role of platforms, value of innovation and also balance between firm's data needs as well as consumer privacy. Off late there is a proper structure promoting the development of applied digital technology through research based education centers and also international competence centers. Properly creating the conditions for a more reliable and secure process of generating, storing and also using data is the primary basis for protection from the cyber security hazard that which could act as a brake on technology advancement aspects. The research paper reviews some major recent economic research that which sheds light on major issues and also discuss as to how well designed policies on competition, regulation, consumer privacy and IP protection can all improve market performance in the digital economy. The research paper also highlights important implications for encouraging digital entrepreneurship aspects by focusing mainly on institutional, technology as well as local dimensions of context and various other such measures to develop significant entrepreneurial and digital competencies. It also includes policy interventions to develop information and communication technology (ICT) infrastructure, transport and other local distribution infrastructure and other such training opportunities to essentially develop digital entrepreneurs for improvising market performance in the digital economy.*

**Keywords:** *Digital economy, digitalization, digital entrepreneurs, ICT, policy interventions, market performance, digital technology*

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## Introduction:

Digital economy is sometimes defined narrowly as economic activities essentially in the form of information and communication technology (ICT) which includes the internet, telecommunications, IT services, software and hardware. However, the broader definition of the overall digital economy includes combined value of ICT

production and also digital inputs to rest of economy. There are different estimates about the size of the digital economy because of the differences in the definition. Also in 2017, the narrowly defined digital economy accounted for around 6.9% of the overall GDP in the US, 6% of GDP in China and around 4.5% of GDP in the global economy; however based on the broad definition the respective numbers were 21.6% in US, 30% in China and around 15.5% globally (as per 2019 Digital economy report, United Nations). There is no doubt that digital economy is impacting each and every aspect of our lives despite the differences in the definition and measurement. Besides, we consider the digital economy as encompassing all major economic activities that use or are actually facilitated by most of the digitized data, then it can be essentially considered as the entire economy. New digital technology and internet have certainly reduced costs of search, reproduction, entry, transportation unleashing enormous potentials for enhancing economic efficiency and effectiveness. Also at the same time, cost changes raise new challenges for organization of markets mainly because of their profound impacts on role of platform, the value and protection of innovation and also tradeoff between firms overall data usage as well as consumer privacy. The present paper reviews the highlights and insights from some of the recent studies on significant opportunities and challenges especially in the digital economy pertaining to such issues related mainly to platforms, consumer data and innovation and also discusses oh how well designed polices can certainly improve the overall market performance. Growing importance of various platforms and also platform enabled various products/services. Basically a platform is an intermediary for transactions and with the reduction in consumer search cost on the internet one might even think that there is a diminished need for intermediaries. Also, the internet has substantially lowered entry as well as consumer search costs, which certainly has greatly expanded the overall size of markets and besides increased the number of firms a consumer can essentially access. Technology context is also the 'architectural attributes of the underlying technology' that which shape the entrepreneurial/ innovational activities of various stakeholders within a given network as seen in various digital platforms and networking technologies. Both institutional context and technology context shape the local context through changing local practices. The institutional context (including government policies) shapes the ICT infrastructure (mobile/internet penetration rates) and other such physical infrastructure (logistics as well as local distribution channels). These aspects in turn affect various choices that businesses make about the extent of digitalization and also product/service delivery channels. Recent research has shown that by coordinating and also guiding consumer search, a search platform can however improvise market efficiency. However, it can also be ascertained that a platform may have distorted incentives when it is partially vertically integrity. In guiding consumer search a platform may also perform poorly when product quality is not observable. Also due to network effects and other such factors, platforms often possess enormous market power and may also abuse their market dominance.

Digitalization, off late has greatly increased the value of innovation and also the need for intellectual property (IP) protection. As many digital products have distinctive property of low production and transportation costs this is especially true, hence it is essential and feasible as well as efficient for one firm to serve a large market with innovative product so that innovation becomes more valuable. On the other hand, strong intellectual property rights especially patent protection is needed in order to deter imitation and also provide desirable innovation related incentives. Also the literature on economics of innovation has devoted quite increasingly more attention towards sequential or cumulative innovation where effects of patent policy are very much different from those for a single level innovation factor. Two recent studies that which yield new insights on how patent policy may improve an industry's overall performance in innovation are discussed here. Firstly, Chen, Pan and Zhang (2018) analyze how exactly patentability standards impact the rate and direction of innovation where rate of industry innovation is shown to vary with patentability standard in an inverted U shape. Besides, Chen and Sappington (2018) study the optimal and poignant rule for patent infringement damages in a sequential innovation environment. As values of innovation rise and also costs of imitation fall, IP protection and innovation will certainly play vital role for economic development in the digital age. Furthermore, increase in IP protection and also reduction in search cost may increase efficiency of market for technology giving rise to much more external innovation rather than internal innovation. To gather and essentially store data, equipped with loads of digital technology firms not have enormous capability to go ahead and learn about consumer preferences and also utilize such knowledge in their day to day business activities. To facilitate various transactions some consumer data, such as those with information to open an account with a firm are quite obviously needed. Also for those firms to provide better products consumer data can be very much useful. For instance, to design and produce new or better products for firm's information about consumers and consumer demand can help. During the covid-19 pandemic the enormous impact of various products and services enabled by digital technology/digital data is in full display.

It is summarily opined that for atleast three reasons, consumer information collected by firms can also potentially harm consumers. Firstly, firms may well use consumer purchase history to readily engage in price discrimination. Secondly, consumers may generally have an intrinsic preference for privacy issues and hence suffer from the collection of their personal information by firms they are associated with. Thirdly, data breaches can leak certain information which are personal in nature and harm consumers. New insights on the potential trade off have been offered in recent research in economics in protecting data on the optimal design of regulatory policies imposed upon. Today during this pandemic scenario, virtual meeting platforms such as Zoom video communications Inc, Microsoft teams, Google meet etc amidst large declines of the overall stock market are conducting academic conferences and business meetings which are being held online and also have led to substantial increases in stock prices. While having already provided with conveniences before majority of online shopping sites for groceries and online ordering for restaurants are certainly a necessity for many people during this pandemic period. Also one of the common practices is online provision of healthcare services and virtual doctor appointments. Thus it can be interpreted that clearly digital economy has certainly played a decisive and crucial role in supply of goods and services during this ongoing pandemic and it will also continue to be a driving force for economic growth in the upcoming 'new normal' afterwards.

### **Platforms as major information intermediaries:**

To find product and price information consumer often need to incur search costs and intermediaries have long existed to reduce such costs and also facilitate transactions. To quote an instance, shopping malls have traditionally served as intermediaries for many consumers who search for products and services from different sellers. Consumers can access various products and services at lower search costs as transactions are increasingly mediated through internet and digital technology. Suddenly a question arises as to whether lower search costs in the digital economy can reduce the need for intermediaries? In order to answer this question one must recognize that the internet and digitalization have also greatly expanded the market and consumers nowadays also face a much larger set of sellers to choose from. In making intermediaries more valuable for facilitating transactions the market size effect appears to be the dominant force between sellers and products in the digital economy. This has certainly led to the enormous commercial successes of major platform companies such as Amazon, Google, Tencent and Alibaba. Platforms operate in different ways. For instance, Google's search engine provides sponsored links to sellers who win keyword auctions. When consumer clicks the seller's link a seller makes a payment to Google regardless of whether and how much the consumer purchases it from the seller. An online marketplace on the other hand may host various sellers, each of whom could be actually charged a fixed hosting fee of even a commission as a percentage of the transaction amount (Example: Expedia for hotel booking). For independent sellers an online store like Amazon is both a multi-product retailer and also a marketplace as it sells various products by itself while also hosting independent sellers as an intermediary.

Athey and Ellison (2011) and Chen and He (2011) were the early contributors that which explore the role of major platforms as information intermediaries thus guiding consumer search. A platform has a certain number of advertising positions which are made available to sellers through auctions and sellers are placed on the platform in the order of their bids. With higher quality sellers offering a product, sellers do differ in quality that which is more likely to meet a consumer's need. To visit a seller each consumer must incur a search cost through which the consumer uncovers whether seller's products is a match for him/her. At a higher position on the platform in equilibrium a higher quality seller is willing to bid more because he expects that a consumer searching his site is more likely to find a match and also make a purchase. As each consumer has the same value for her matched product even if it is sold by different sellers set the same price. Consumers also possess the incentive to visit sellers sequentially in the descending order of their positions on the platform anticipating the seller's strategy and also their paid placements. The platform however acts as a coordination device enabling majority of the consumers to search more effectively and efficiently thus finding a match with less expected search cost and in turn also enabling high quality sellers to reach more customers in longer time period. It is also believed that the problem of low quality products and sellers in the online market is related to low entry cost in these markets. Chen and Zhang in their research study opine that under plausible conditions the quality effect certainly dominates when entry cost is low so that social welfare and consumer surplus both initially rise with search cost even though they eventually fall at some instance. This also suggests that in a digital economy, wherein entry barrier is very low for majority of the markets,

regulations that which impose entry restrictions could actually improve the market performance. However, the increase in entry costs, possibly in the form of licensing fee, or even a minimum quality standard, a certification of qualifications can certainly matter which can raise the product quality and also boost both consumer value and overall total welfare.

### **Some of the major challenges and lessons learnt by applying digital economy are as follows:**

Experience from developing and also applying digital economy assessments methodologies does point to the following mentioned lessons and challenges:

1. Clarifying and also prioritizing objectives
2. Securing essential coherence among assessment tools and devices
3. Addressing the need of poverty and also inequality
4. Strengthening country implementation
5. Promoting local demand and also effective use of local resources
6. Integrating innovation aspects
7. Integrating digital economy into a country development strategy
8. Collaborating across various sectors and also varied practices
9. Engaging in effective business
10. Managing increasing demand and also risks wherever necessary
11. Attending to proper process, participation and also partnerships

Let us discuss all the above mentioned points in detail:

➤ **Clarifying and also prioritizing objectives:**

The primary objective of assessment became data collection in most pilot studies. Almost all the resources went to tool refinement and also data improvement; little however was left to formulating the new or updating the ongoing digital development oriented strategy. Also assessment data at times was quite confused with strategy.

Ranging from tool development and data collection, to actually building capabilities for assessment, formulating specific recommendations, generating national consensus on strengths and weaknesses and designing digital transformation strategy pilot assessments were aimed at implicit objectives. Also for the tools and processes which are used for assessment purposes the balance among competing objectives have varied implications for the engagement team skill mix, resources and also accountability.

➤ **Securing essential coherence among assessment tools and devices:**

Within the World Bank group (WBG) drawing on pilot assessment experiences, coherence among various digital economy (DE) assessment tools proved to be a key challenge. Various global practices and regions became attached to their own assessment tools. Adapting rapid prototyping and moving towards a standard comprehensive assessment framework was the original WBG goal that would be adapted only as deemed essential and also necessary to specific country conditions. Critical decision however vests upon determining the boundaries of the digital economy ecosystem. Also a comprehensive coverage of the entire ecosystem would capture key interdependencies within the overall ecosystem and also enhance the economic impact. But however, the scope of assessment may be dictated by the skills, time, data and other such resources that might be available for assessment. Also country leadership may well be interested in specific aspects of the digital economy which might help to determine the focus of assessment tool.

➤ **Addressing the need of poverty and also inequality:**

Digital technologies are likely to contribute to rising inequality unless they are harnessed for inclusive development. Evidence so far suggests and shows that among and within developing countries the aggregate impact of digital technologies is highly uneven (World Bank, 2016). Yet to achieve shared prosperity and reduce poverty many of these technologies such as mobile money offer new and significant opportunities. However, as a central focus for their digital economy strategy none of the sample pilot countries made moderating inequality and reducing poverty. Also at the national and sub national levels, the current assessment tools did not provide any adequate coverage of digital inclusion and income inequality. Also to capture digital related income, gender and geographic disparities current national level assessment indicators are too aggregate. Also assessments often failed to explain the persistence of barriers

to suitable inclusion: what actually explains slow and uneven adoption? Also how efficient and effective is current usage in contributing to poverty reduction? Why promising applications for poverty reduction often fail to scale up? What significant mechanisms would be needed to counter monopolistic and clustering tendencies of various digital platforms and digital industries? Assessments also did not attempt to systematically track and empowerment impact as such of new available technologies. Besides in shaping and implementing an inclusive transformation strategy assessment results were not used to engage poor communities.

➤ **Strengthening country implementation:**

To render judgement on the capabilities of existing institutions to go ahead and implement proposed strategies most pilots did not assess the implementation quality of past strategies. Yet, country experience suggests that the hardest part of digital transformation is the implementation of digital economy strategies (Hanna 2016; Hanna & Knight). During strategy formulation phase successful countries have done the most preparation for the implementation stage. However, digital transformation essentially calls for developing new institutions, mobilizing local ICT services sector, creating new cadres of digital leadership, strengthening digital governance and also including new information and innovation officers (CIOs).

➤ **Promoting local demand and also effective use of local resources:**

In general, assessment indicators did not adequately capture actual adoption rate and also effective use of digital technologies and also in public agencies, small businesses and traditional businesses in particular. Yet, it is seen that the greatest dividends are ultimately realized from diffusion and also spillover of digital technologies into significant key economic sectors and areas. There is significant scope to stimulate public demand for most developing countries for innovative and locally tested digital solutions, especially for those coming from technology SMEs and local innovators. The uptake however is relatively low despite significant strides in providing citizens with government services online. This likely suggests that the urgent need for demand mobilization measures, such as strengthening demand for good government initiatives, retraining civil servants and also promoting digital and media literacy at large.

➤ **Integrating innovation aspects:**

Pilot country assessment of the digital economy is focused mainly on the adoption of the latest technologies. It however neglected to include adaptive, incremental and also bottom-up innovation that which would be necessary for the diffusion of existing technologies and also their fit into new contexts. Also within the public and private sectors assessment of local innovation and entrepreneurship ecosystems did not give due attention that could be scaled up and also integrated into a proper digital economy strategy. Policy innovations and unconventional economic thinking are the calls for the rise of digital economy which calls for exploring new pathways to local value capture and creation. For instance, servicing local markets and also poor communities would often require creating blended digital analog processes. However, assessments should push for likely innovations that which come from the grassroots, beneficiary engagement and cross-sectoral collaboration.

➤ **Integrating digital economy into a country development strategy:**

One of the vital key finding of this review is that digital diagnostic tools made only modest progress in narrowing the gap which exists between digital economy strategies and country development strategies. Also in isolation of country economic development diagnostics digital diagnostics are often conducted and thus also fail to make a clear connection between progress which vests on digitalization of the economy and also progress towards achieving the sustainable development goals (SDGs). Ideally, as digital technologies can offer new options for development strategies the formulation of both the digital economy and country economic strategies should proceed interactively while development strategies may still harness digital technologies for new uses and also innovations. Also the present existing gap between digital development practice and country economic development practice should be bridged. More progress will however depend upon addressing the underlying institutional barriers that perpetuate the gap existing between development and technology specialists in developing countries and also aid agencies.

➤ **Collaborating across various sectors and also varied practices:**

A whole set of government approach within countries and multi-disciplinary development practices within aid agencies is required for an advancing economy wide digital transformation. Providing a cross-sectoral view of the state of the digital economy is the core objective of a holistic assessment of the digital economy thus enabling the country to design coherent policies and programs and also coordinate aid and investment measures for digital transformation. Besides collaboration among economic sectors and development practices to deliver more integrated solutions to advance digital transformation and thus help countries

break their own ministerial and sectoral silos as part of economy wide digital economy assessment is expected.

➤ **Engaging in effective business:**

In shaping national digital economy strategy engaging business as an equal partner remains a key challenge for most of the developing countries and aid agencies. Whilst to secure collaboration between the World Bank and its private sector arm significant progress has been made, much however needs to be done to engage IFC in the full cycle of assessment, strategy formulation and implementation and downstream investments. Full and complete IFC engagement in the digital economy would essentially require that WBG prioritize upstream policy reforms that which can unlock opportunities for deployment of private sector solutions in the digital economy. Prioritizing investments in the local digital businesses will also be required that which can strategically contribute to the whole digital economy ecosystem.

➤ **Managing increasing demand and also risks wherever necessary:**

Diagnosis of pilot digital economies on the whole erred more on strengths and opportunities, less on accompanying risks, downsides of digitalization and tradeoffs and also country's capacity for managing these risks. Also insufficient attention has been paid to ways by which digital platform firms exacerbate income inequality and also adversely impact the distribution of the gains. Besides assessments may give special attention to development of local digital platform firms that which can serve local needs and thus capture value and also digital intelligence from local data. It is also critical for developing countries in particular to use the diagnosis to assess the disparate impact of major digital innovations and also indiscriminate use of disruptive technologies on majority of semi-skilled jobs and local capacity to create alternative jobs and skills.

➤ **Attending to proper process, participation and also partnerships**

The process used invariably to assess the digital economy can influence outcomes, outputs, impact and also accountability. As part of promoting ownership and client participation it may be driven by such objectives forming partnerships and coalitions thus developing capacity and institutions and also mobilizing local knowledge in the process. Assessment tools were applied w.r.t pilot studies and excessive attention was given to refining the tools, data collection and also reporting but often at the expense of engendering successful ownership as well as effective use of destined results. The degree of local stakeholder participation in digital economy assessment and downstream strategy development varied quite greatly. To include intermediary institutions little effort was made to influence the composition of local participating team representing small businesses, civil society, trade and professional associations and also poor communities.

### **Consumer data and privacy protection measures:**

Gathering and storing required data is central part of digital economy. Regarding digital data over the internet in recent years, we have certainly witnessed an exponential growth. According to Global Internet protocol traffic, a proxy for data flows says that there has been a drastic and dramatic growth from 100GB per day in 1992 to around 46,600 GB per second in 2017 and is also expected to grow around 1, 50,700 GB per second in 2022 (as per 2019 Digital economy report released by United Nations). To essentially develop new products and also serve consumers firms have greatly expanded their use of big data analytics, digital platforms and artificial intelligence. Also access to data and the significant capability to utilize data have become very much essential for competitiveness of firms in the digital economy. For the crucial developments in artificial intelligence (AI) in particular, the growing ability of firms to analyze and also process massive amounts of data have gained paramount importance. In areas such as voice recognition, robotics and automation AI is already in news. Besides AI will also make self-driving cars a reality together with new technologies such as 5G and also new computational power. It is also currently estimated that by 2030 AI has the potential to generate additional global economic output of around \$13 trillion by 2030, contributing an additional 1.2% to annual GDP growth (as per 2019 Digital economy report released by United Nations).

To learn and understand various ways about consumer behaviour and preferences firms have possibly using information about consumer's overall personal characteristics, their past purchases and so on. For opening an account with a merchant and thus facilitate transactions some of the related consumer information such as consumers name and address is often needed.

### **Platforms as major information intermediaries:**

Consumers frequently have to pay for search expenses in order to obtain product and price information. Intermediaries have existed for a long time to help minimize transaction costs and facilitate transactions. Shopping malls, for example, have long operated as go-betweens for customers looking for products from a variety of vendors. Consumers can access things at lower search costs as transactions are increasingly mediated through digital technologies and the Internet. Will the internet economy's decreased search costs reduce the need for intermediaries? To respond, one must acknowledge that digitization and the Internet have considerably extended the market, giving consumers a far bigger pool of sellers from which to choose. This market size impact appears to be the main force, increasing the value of intermediaries in the digital economy for facilitating transactions between sellers and products. Platform businesses like Google, Amazon, Alibaba, and Tencent have reaped significant commercial rewards as a result of this.

Digital technology adoption, diffusion, and effective application are crucial for equitable growth and poverty reduction. As a result, demand from lagging conventional sectors, small enterprises, and underprivileged communities should be assessed using digital diagnosis. Public demand for digital uptake and successful use in social sectors such as health and education should be given due consideration. To invest in digital literacy, digital public services, local content, societal apps, and other demand mobilization strategies, governments must collaborate with the commercial sector, trade and professional associations, and social intermediaries. These sectorial needs and possibilities should be captured in assessments. Jobs, gender, governance, the environment, and other cross-cutting concerns affecting shared prosperity should all be addressed. Digital economy diagnostics and follow-up support should be closely monitored by transformation leaders to ensure that inclusion concerns are systematically addressed and that digital transformation is used to alleviate poverty and moderate income and regional inequalities. Monitoring and evaluation of local innovation projects that are most relevant to inclusion should be included in assessments. The use of digital identity as a platform for inclusion may be given high emphasis in the assessment.

Tools, techniques, and reports for assessment should be broadly disseminated across aid agencies and countries. The lack of a consistent assessment system at this point should allow for debate, learning, and creativity. Partnerships with local universities and think tanks, as well as international organisations, should be promoted in order to develop and institutionalize assessment methodologies and to increase donor cooperation. Collaboration, risk-taking, learning from mistakes, openness, and trust should all be part of the assessment programme. Assessments should be viewed as chances for communication, research, and learning with clients by aid organisations. Creating shared platforms would take advantage of significant economies of scale in data collection and analytics for digital evaluation.

Information technologies have now become "one of the threads sewn into the fabric of organization" (Zammuto et al. 2007, p. 750). Given its disruptive character and cross-organizational and systemic consequences, digital technologies are seen as a crucial tool for driving organizational transformation (Besson and Rowe 2012). Changes at various levels within the organization are required to achieve successful digital transformation, including core business adaptation (Karimi and Walter 2015), resource and capability exchange (Cha et al. 2015; Yeow et al. 2018), process and structure reconfiguration (Resca et al. 2013), and leadership adjustments (Hansen and Sia 2015; Singh and Hess ). (Llopis et al. 2004). As a result, the focus of our investigation is limited to digital transformation at the organizational level (in contrast to implications at the individual level).

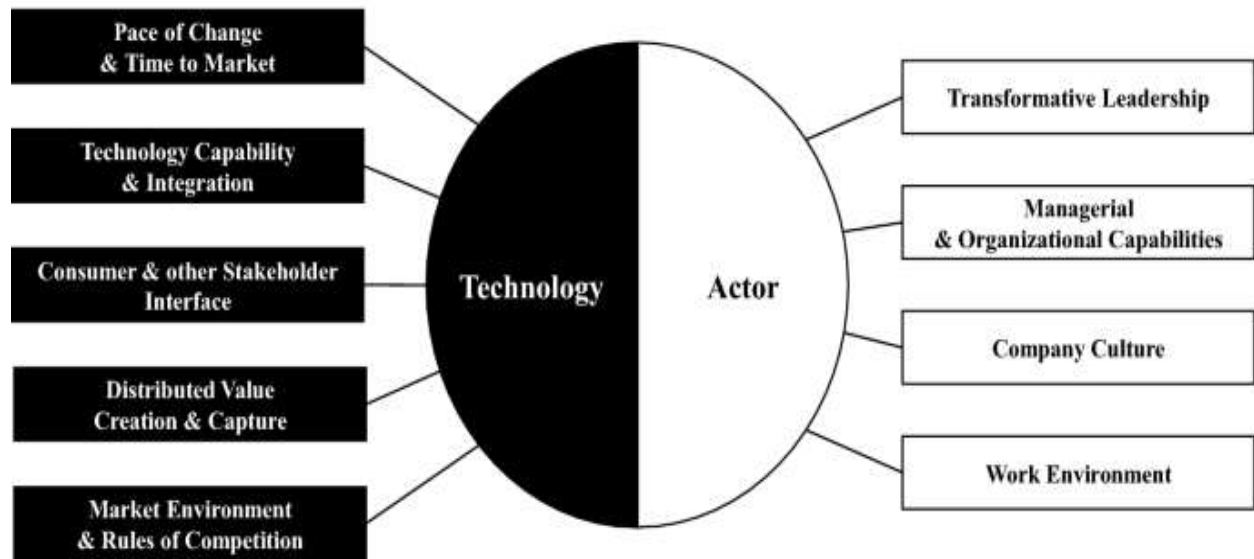
For a long time, scholars have recognized technology as a fundamental influence of organizational form and structure (Thompson and Bates 1957; Woodward 1965; Scott 1992). After a major drop in interest in this relationship until the mid-1990s (Zammuto et al. 2007), advances in information technology (IT) and the advent of pre-internet technologies have reignited its relevance in the context of organizational change. Thus, one of the scholarly roots of digital transformation research can be found in the literature on IT-enabled organizational transformation, a concept that comes from the field of information systems (IS) and has gotten a lot of attention since the early 1990s (Ranganathan et al. 2004; Besson and Rowe 2012). Morton (1991) claimed in his key work that for effective IT implementation, businesses must undergo fundamental transformations.

Several writers use several theories to describe the context of digital transformation, such as alignment perspective, configuration theory, resource-based view, dynamic capabilities, organizational learning theory, network view, or business process reengineering. It would be interesting to look at things from different theoretical perspectives.

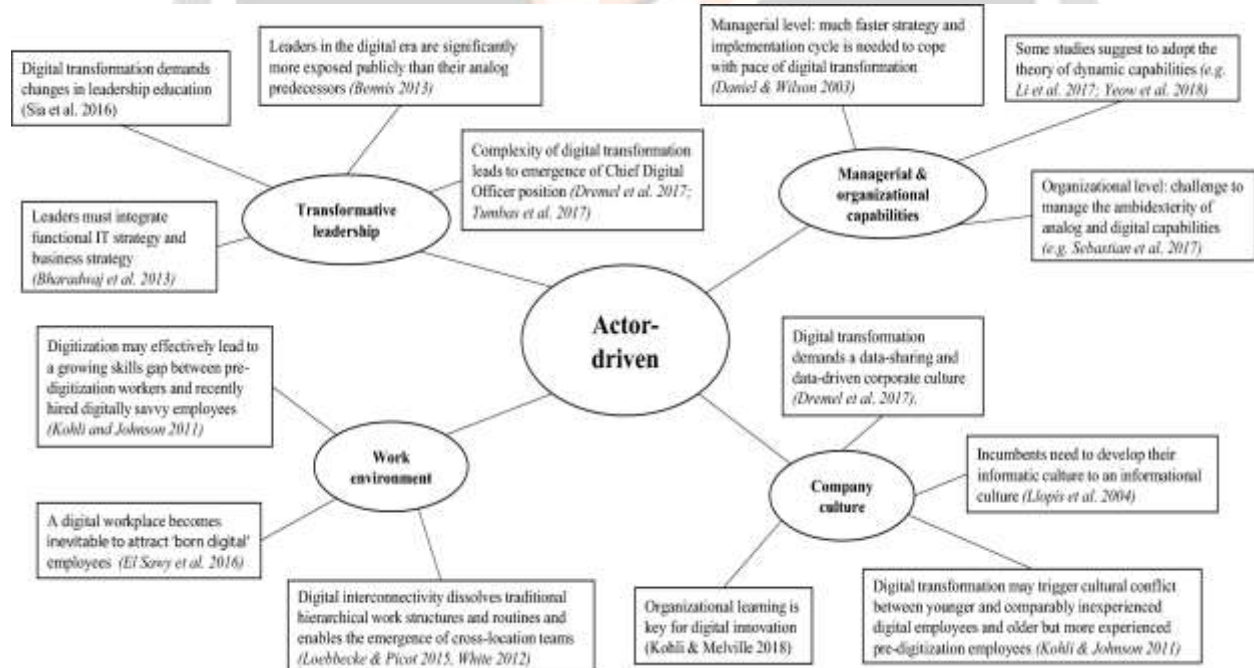
Second Order Themes

Aggregate Dimensions

Second Order Themes



Above image showing Digital transformation high level thematic aspects



Above image showing thematic map for actor driven themes related to digital transformation



## Technology capability and integration

In many cases, the technological capability and power of digital transformation applications, such as the Internet of Things (IoT), big data, cloud computing, and mobile technologies, is significantly higher than previous technology-driven transformations in terms of computing power, data storage, and information distribution. Previously, internal management information systems such as enterprise resource planning (ERP) or customer relationship management (CRM) were the primary focus of business changes (CRM). Typically, these reforms were restricted to enhancements to internal business processes (see Ash and Burn 2003; Kauffman and Walden 2001; Li et al. 2017). Cross-border digital technologies such as IoT devices (Ng and Wakenshaw 2017), 3D printing (Rayna and Striukova 2016), and big data analytics (Dremel et al. 2017) are now driving transformations that go far beyond internal process optimizations, as they have the potential to cause drastic changes to business models (Rayna and Striukova 2016), organisational strategy (Bharadwaj et al. 2013), and corporate curation (Dremel et al. (Kohli and Johnson 2011).

## Conclusion:

The Internet and digital technologies have fundamentally altered the way markets operate. The dramatically lowered costs of search, transportation, replication, and entrance open up a plethora of new market efficiency prospects. At the same time, the growing importance of platforms, innovation, and consumer data in the digital economy presents new issues in terms of effective competition, IP protection, and consumer privacy. This work has shed light on these new economic factors and the best design of policies to improve market performance, using insights from recent industrial economics research. The following key messages would be reinforced by lessons learned from the digital diagnostic programme: develop digital leadership and institutions; strengthen both the digital and non-digital foundations of the DE; align the DE strategy with overall country development strategies; set sectorial transformation priorities in health, education, and essential public services; develop digital economy skills and capabilities; address the digital divide. These proposals apply equally to aid organisations like the World Bank and poor countries.

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