

# Technoentrepreneurship: New Framework for Public Policy Identification and Development with Special Reference to India

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## Abstract:

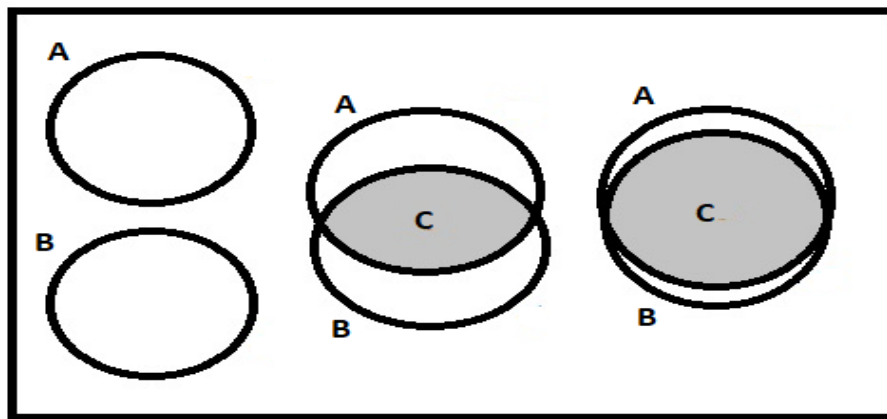
New business models have emerged under the broader umbrella of Technoentrepreneurship across the world. In the era of digital innovation and entrepreneurship, it becomes a priority for policymakers to design policies that can create a favorable environment for the growth and prosperity of digital enterprises. However, the question of concern is of course – Is there any theoretical basis to identify and develop the Technoentrepreneurship policies?

This paper contributes to forming a new theoretical framework for public policy identification and development. Based on the newly defined approach the relevant policies for Technoentrepreneurship from India have been identified. Further, the outline of the PRISMA Framework has been used to arrive at suitable public policies for the purpose of analysis. The proposed new approach will benefit the upcoming public policy research in the domain of Technoentrepreneurship.

**Keywords:** Entrepreneurship, Technoentrepreneurship, Startups, Need Model, Startup Policy, Ease of Business, E-Entrepreneurship, Doing Business Report, Information Technology, Digital Entrepreneurship

## 1. Introduction to Technoentrepreneurship

The term and the phenomenon associated with Technoentrepreneurship is quite a new addition to the area of research in entrepreneurship. The terminologies like e-commerce or startups either narrow or broaden the scope of Technoentrepreneurship. These terms – Technoentrepreneurship, e-commerce, or digital startups refer to the broad categorization of businesses using technology or business run by technology-aided tools or methods. The businesses operating in the IT/ITES industry or software enterprises are not the only business types categorized under Technoentrepreneurship. The enterprises that use a software interface to sell food online or the enterprises which use artificial intelligence to solve agriculture-related problems are also considered under Technoentrepreneurship. The figure below illustrates the nature of Technoentrepreneurship.



**Figure 1: Illustration of Technoentrepreneurship; Circle 'A' depicts the brick & mortar business and Circle 'B' depicts digitization. The intersection (gray area) of both circles represents the area of Technoentrepreneurship; Source: Authors' Model.**

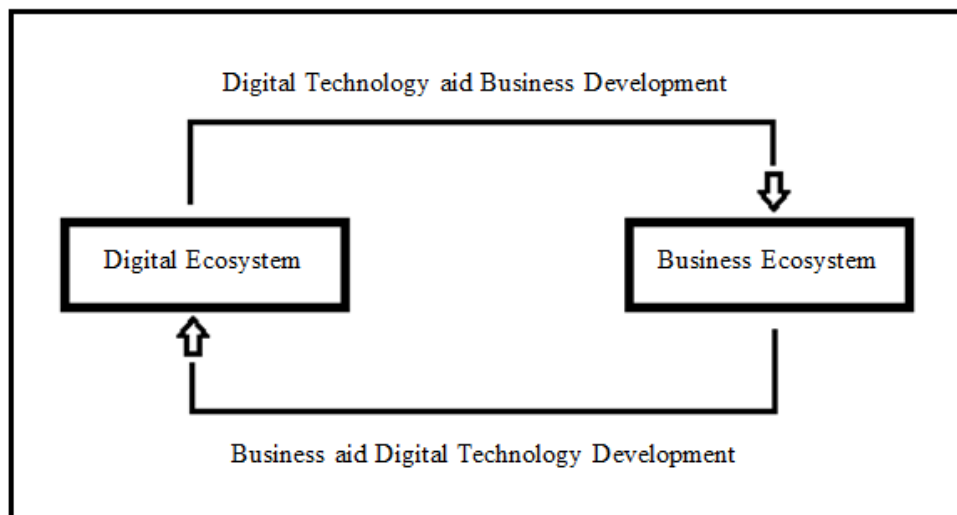
The debate surrounding Technoentrepreneurship is whether enterprises that are not completely digital in their operations should be considered digital enterprises or not. For example, restaurants that sell their food through online food aggregator platforms also may offer their food at their real dining places. These can be called partial digital enterprises. Such enterprises may not be considered equal to the enterprises where the complete value chain is in digital format; These are called total digital enterprises. It is to be noted that since it is the beginning of the era of the digital economy, it is not common to have total digital enterprise models everywhere; any enterprise will have some degree of digitization and also offline operations. Concluding this debate over finding a clear definition of Technoentrepreneurship it can be defined that ventures which have a maximum degree of digitization or when the maximum part of the value chain of the venture is digital then it is called Technoentrepreneurship.

## **2. Theoretical Framework for Public Policy Identification & Development**

In the era of continuous technological development, particularly in mobile technologies, social media, analytics, cloud computing, and quantum computing – thousands of new business models are emerging under the broader umbrella of Technoentrepreneurship. In this context, the question of concern is of course – Is there any theoretical basis to develop and analyze the Technoentrepreneurship policies?; To answer this question a new theoretical framework has been developed.

### **2.1 Two-Factor Model for Technoentrepreneurship**

It states that Technoentrepreneurship is derived from two factors. These factors are the availability of digital technologies and the availability of businesses that use & produce digital technologies. The Digital Ecosystem and the Business Ecosystem are predominant and exclusive causes of Technoentrepreneurship.



**Figure 2: Two-Factor Model of Technoentrepreneurship**

From the above model, it is evident that the definition and understanding of Technoentrepreneurship has a wide scope cut across various dimensions of technology and business-related requirements.

It is to be noted that research in the policy field of Technoentrepreneurship is a recent phenomenon. So there is a dearth of literature that could give a proper basis for various Policy factors oriented toward Technoentrepreneurship. For this reason, we propose a '**Two-Factor Model of Technoentrepreneurship**'. This model emphasizes the factors and policy dimensions that are inseparable and interdependent for Technoentrepreneurship.

**Digital Ecosystem:** The policy that stimulates the infrastructure, security, social, and esteem needs that ultimately actualizes the Digital Ecosystem.

**Business Ecosystem:** The policy that deals with various business operational aspects like starting a business, permits for construction, availability of electricity, property registration, trading across borders (both talent and technology), enforcing contracts and dealing with litigation, resolving insolvency, availability of credit, protecting investors, tax payments, are included under the Business Ecosystem.

## 2.2 Digital Ecosystem: The Needs Model for Digital Ecosystem (NMDE)

To make Technoentrepreneurship a narrative in the startup ecosystem "The Needs Model for Technoentrepreneurship" is proposed. This model enhances the perspective and brings in various dimensions which are fundamental to make the idea of Technoentrepreneurship more prominent to foster Industry 4.0 through public policy.

Actualization	Digital Ecosystem
Esteem	Innovation, Research & Development, Intellectual Property Rights
Social	Talent / Skilled Manpower, Skill Development Facilities / Institutions
Safety	Cyber Security, Data Privacy, Net Neutrality
Infrastructure	Smart Phone/ Computer, Data Server / Cloud Storage Facility, Internet

**Figure 3: The Needs Model for Digital Ecosystem (NMDE)**

The above model takes reference from Maslow's hierarchy of Needs (A.H. Maslow, (1943). It illustrates the various strata of needs necessary to build up the digital ecosystem. In a way, it focuses on the areas where policy intervention is required. Each 'need' in isolation may not be able to provide a strong causal relationship with Technoentrepreneurship. For example, wide internet penetration doesn't necessarily mean a vibrant digital ecosystem. So the researchers must be cautious and be able to understand that each stage is more like a stepping stone toward the ultimate actualization of the digital ecosystem. The policies which talk about the digital ecosystem must look into all the aspects in the hierarchy rather than any growth or uptrend of an element or parameter.

The digital ecosystem is in the fifth layer of the hierarchy. In the process of fostering the digital ecosystem in the national and state policies in the country, it is necessary to acknowledge all the layers. The Needs Model for Digital Ecosystem (NMDE) is not always unidirectional or bottom to top; at times the policy intervention at any of the strata affects its top or bottom layers. For example, the Reserve Bank of India's (RBI) guidelines say that the data related to all the payment transactions of the Indian national must be placed in India. This safety policy of RBI creates infrastructure needs that will create digital infrastructures like data warehouses or data centers in the country.

**2.3 Business Ecosystem: Ease of Business Metrics for Business Ecosystem**

The Ease of Doing Business Index (EOBI) published by the World Bank has been adopted to define the Business metrics for the Business Ecosystem. The ranking based on the index is published every year considering the various parameters which combine the broad categories of Starting, Operating, and Exiting the Business in a country (Bhanushali,2015).

<b>Set Up the Business</b>	Starting a Business
	Permits for Construction
	Availability of Electricity
	Property Registration
	Availability of Credit
<b>Business Operation</b>	Trading across the borders
	Enforcing Contracts
	Protecting the Investors
	Tax Payments
<b>Exit from the Business</b>	Resolving Insolvency

**Figure 4: Categories & Parameters of Ease of Doing Business Index (EOBI)**

The regulatory best practices for doing business in a country are considered to define the distance of the frontier for each parameter. Further, the economies are benchmarked and ranked accordingly. All the member countries of the World Bank are ranked to assess the business-friendly ecosystem available in a country. Since the EOBI is widely accepted it is adopted for the present study to enhance the perspective on the Business Ecosystem.

**3. Research Methodology:**

The theoretical framework developed in the previous chapters is used extensively for the discussion & analysis of public policy. The Two-Factor Model of Technoentrepreneurship (Fig 2) is proposed to be the theoretical base for the identification and development of public policies in the domain of Technoentrepreneurship. The Model has two fundamental dimensions: Digital Ecosystem and Business Ecosystem. For a deeper understanding of the Digital Ecosystem, the Needs Model for Digital Ecosystem (Fig 3) is designed. Further, for a deeper understanding of the Business Ecosystem, the Ease of doing business index (Fig 4) is adopted.

The fundamental method of research adopted in this paper is qualitative in nature.

The public policies which were implemented between the years 2014 and 2019 (5 years) at the National level in the Indian Republic by the Government of India (GOI) are considered for the analysis. The time frame was defined from the year the Digital India Initiative was notified by the Government of India and the previous year of official notification of Covid19 pandemic by WHO (Zanke, 2020).

The source of data is taken from the Economic Survey, Budget documents, press releases (PIB), and Websites managed by the Government of India (GOI). The three step procedure or the outline of PRISMA Framework has been used to arrive at the list of public policies that are to be considered for the purpose of analysis.

Identification: For the identification of public policies exhaustive literature survey has been conducted. The policies identified for the purpose of analysis under the Digital Ecosystem are based on the 'Needs model for Digital Ecosystem' and under the Business Ecosystem is based on the World Bank 'Ease of Doing Business Index'.

Screening: The committee reports, draft policies, draft guidelines, directions passed by any other government body, an ordinance of the central cabinet, bills lapsed due to the dissolution of Lok Sabha, and Supreme court judgments passed on the acts of parliament have been excluded from the study.

Inclusion: The policies approved by the Ministries, Cabinet of the Union Government of India, and acts passed by the Parliament of India are considered. In the selection of the policies, due care has been taken to see that all such policies are in operation.

In India there isn't any comprehensive database related to public policies on digital enterprises, e-commerce platforms, and start-up activity. So for the study it was only possible to adopt the outline of the PRISMA framework.

#### **4. Discussion – Review on the Policies with regards to Digital Ecosystem and Business Ecosystem**

##### **4.1 Digital Ecosystem**

###### **4.1.1 Digital India Initiative, 2014**

“Digital India initiatives have put a thrust on re-engineering and revamping existing government schemes and designing new initiatives to meet changing economic needs. India is forecast to be a USD 5.2 trillion economy by 2025 and the contribution of digital services to the GDP is expected to grow 10 X in the same period.” (IAMAI, 2019)

The emerging digitization initiatives are fostering the institutions to transform their workflow using digital technologies in a way they have a tremendous impact on the economy and society (Chakraborty, 2016). Universal digital literacy is a social need for capacity building to elevate the ability of citizens toward the digital ecosystem. The delivery of government services through digital modes ensures that citizens get used to the digital ways of living. This has a cascading effect to bring about sociocultural change in society. Another category of the policy indicates the Infrastructure needs to support the digitization efforts of the government (PIB, 2014). “Government strategy for digital India needs to become firmly embedded in mainstream modernization policies and service design so that relevant stakeholders outside the government are included and feel ownership for the final outcomes of policy reform” (Saldana, 2015).

“It is important to note that ICT (Information and Communications Technology) alone cannot directly lead to the overall development of the nation. The overall growth and development can be realized through supporting and enhancing elements such as literacy, basic infrastructure, overall business environment, regulatory environment, etc” (Chakraborty, 2016)

#### **4.1.2 National Intellectual Property Rights Policy, 2016**

“The National IPR Policy is a vision document that encompasses and brings to a single platform all IPRs. It views IPRs holistically, taking into account all inter-linkages, and thus aims to create and exploit synergies between all forms of intellectual property (IP), concerned statutes, and agencies. It sets in place an institutional mechanism for implementation, monitoring, and review. It aims to incorporate and adapt global best practices to the Indian scenario” (DIPP, 2016)

The policy doesn't identify the business model to be categorized under intellectual property. The category of copyrights would somewhere have a say on the intellectual property of digital knowledge but it will not cover all the aspects of digital technology. All the other categories like trademarks, industrial designs, or trade secrets have very less relevance to the digital ecosystem.

It is high time that industry experts should sit with the policymakers to make them identify the need for a national discussion on the IP policy orientation toward the digital ecosystem. Nevertheless, the policy initiative is a commendable move in the space of protection of Intellectual property and a stepping stone for upcoming policies as well (Sharma, 2018)

#### **4.1.3 National Digital Communications Policy, 2018**

“The policy envisions India's transition to a digitally empowered economy and society, through the establishment of ubiquitous, resilient, and affordable digital communication infrastructure and services. It seeks to unlock the transformative power of digital communication networks and attempts to outline a set of goals, initiatives, strategies, and intended policy outcomes.”(Deloitte, 2018)

The policy has three categories; creating infrastructure for digital communications, fostering services and technologies through investments, innovation, and IPR generation, and ensuring safety and security for digital communications. The categories mentioned and the objectives underlying are very interesting. Under the first category, the need for increasing internet penetration across the country is widely recognized. In the second category, the aspect of creating an IPR policy in line with the global standards focusing on digital

communication is identified. Further, it aims to attract over 100 billion dollars of investment in the digital communication sector to accelerate Industry 4.0. Re-skilling and training are also part of this category. In the third category data protection regime, net neutrality principles are given importance.

“Specifically in terms of a regulatory approach, the NDCP 2018 aims to inter alia (i) reduce (a) regulatory burden, (b) barriers that hamper investment, (c) give an impetus to innovation; and (ii), promote consumer interest in the digital communications and infrastructure space. This appears to align with the Government's larger aim of 'ease of doing business'.” (Nishith Desai Associates, 2019)

“This regulatory change has formalized the hitherto Telecom sector to become a Digital Communication sector and the Network Operators as Digital Telco or Digital Communications Providers. To be relevant in the Digital era Tele Companies have to innovate and evolve their business models: The induction of the telecom sector within the overarching Digital ecosystem & economy (including the much-needed regulatory policies); thus opens new avenues for growth and innovation-driven business models” (Sarkar, 2019)

#### **4.1.4 National Policy on Electronics, 2019**

The vision of the policy is to make India a global hub for Electronics System Design and Manufacturing (ESDM) by providing support through creating a conducive ecosystem for manufacturing core electronics components and enhancing the capability of manpower through Re-skilling. The core idea is to make the country the net exporter of electronic goods.

The policy also envisages the promotion of Industry-led Research and Development, and innovation in all sub-sectors of electronics and early stage Start-ups in emerging technology areas such as the Internet of Things (IoT), Artificial Intelligence (AI), Machine Learning, Virtual Reality (VR), Drones and Robotics, Additive Manufacturing (3D printing), etc. This opens up a wide range of opportunities for tech startups to capitalize on.

A significant part of the policy is the establishment of the 'Sovereign Patent Fund' (state-led corpus to acquire the IP assets) which will ensure the technology transfer which further enhances Technoentrepreneurship in the country (PIB, 2019).



#### 4.1.5 National Policy on Software Products, 2019

“The policy talks about the positive aspects of developing the software product industry in order to keep pace with the advancement of technology globally. Higher levels of innovation are required for leveraging new and emerging technologies like Artificial Intelligence, the Internet of Things, Block Chain, etc. to the maximum advantage across sectors of the economy. The "National Policy on Software Product" (NPSP) is the first significant step towards achieving this goal.” (SS Rana & Co-Advocates, 2019)

It is a much-required policy to shift the country's software industry which is oriented more toward outsourced projects and BPO kind of jobs to Software Products development.

Getting into the details of the policy is set to nurture 10,000 technology-specific start-ups across the country by utilizing already existing infrastructure created both by the government and private sector. Here the idea of this policy is a little unclear and subjective in nature. The policy doesn't specifically mention the mechanism of utilizing the infrastructure and doesn't mention the role of government and private entities in the same. Looking at the funding mechanism the government earmarks Rs 1000 crore for creating a venture fund or a fund pool attracting 4,000 crores from the private sector which will be the funding mechanism for all the 10,000 start-ups.

But here the method for identifying the 10,000 start-ups and the magnitude of the fund to be allocated to each start-up was not discussed elaborately. Rs 500 crore is specifically set aside to provide R&D funding directly to the start-ups, and companies though with this a gap in R&D is filled. But it is very minimal considering the scale of outcome expected. The policy talks to create a million IT professionals to cater to the product industry. It's a challenge in itself. The policy also talks about creating a single window clearance platform for regulatory and legal issues which is a welcome move (PIB, 2019).

Nevertheless “Increase in innovations and IP creation in software products and integration with emerging technologies, especially AI and IoT have led to the emergence of several entrepreneurial opportunities under the Digital India program. This has boosted inclusive and sustainable growth in the sector” (Mehidratta, 2019).

#### 4.1.6 Observation on the Public Policies for Digital Ecosystem in India

The policies oriented toward the Digital Ecosystem in India are limited in scope. A lot needs to be done to ensure that needs such as infrastructure, safety, and esteem are to be fulfilled. Specific policies are required to enhance social needs also. It is observed that though there is general awareness about the future of the Digital

Ecosystem there aren't substantial consistent efforts put forward in the public policy space in India. There are discrete policy initiatives however they are not enough to galvanize the momentum for a vibrant Digital Ecosystem.

#### 4.2 Business Ecosystem

This dimension of Technoentrepreneurship is viewed as limited to parameters and metrics as per the World Bank's Ease of Doing Business Report. But before there is any in-detail discussion on the policies associated with the Ease of Business dimension; it becomes a priority to look back into the performance of India after rolling out the Digital India Initiative. There have been many policy reforms undertaken but due to the bottlenecks in the enforcement system there still needs to be a lot to be done. (Garg, 2018) The Ease of Doing Business is an assessment of 190 economies and covers 10 indicators that span the lifecycle of a business. (PIB, 2019)

India's Global Ranking between 2014 and 2019						
YEAR	2014	2015	2016	2017	2018	2019
RANK	142	134	130	131	100	77

Table 1: India's Global Ranking in Ease of Doing Business between 2014 and 2019

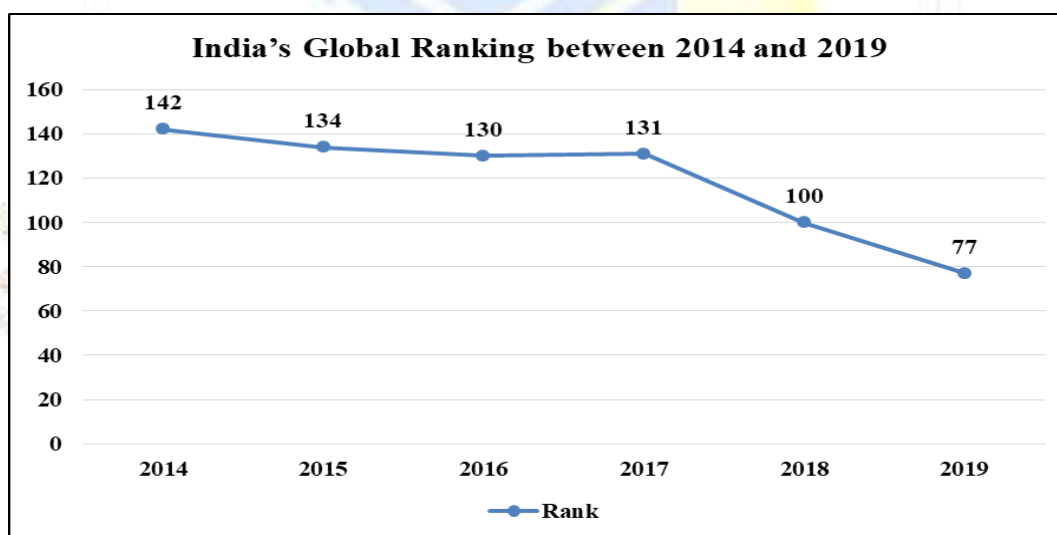


Fig 5: India's Global Ranking in Ease of Doing Business between 2014 and 2019

The first glance into the track record provides a very optimistic picture into the efforts that were put in to bring India as a global competitive destination for Business investments. However it is required to get into the details to understand the dimensions that require more focus. The report published by the World Bank tracks the business environment in Mumbai and Delhi (Chawla, 2017).

#### 4.2.1 Starting up a Business

"India's Companies Amendment Act of 2015, effective May 26, updates the previous 2013 amendment with new provisions designed to improve ease of doing business. It addresses issues such as incorporation, corporate governance, and management of subsidiaries" (Dixit, 2015).

The requirement of minimum capital for both public and private companies has been removed through the Companies (Amendment) Act, of 2015. No Fees for Company Incorporation for companies with an authorized capital of up to Rs. 15 lakhs (PIB, 2019).

Simplified Proforma for Incorporating Company electronically - a single form created by merging five different applications – Name reservation, Company incorporation, Director Identification Number (DIN), Permanent Account Number (PAN), and the Tax Deduction/Collection Account Number (TAN) (PIB, 2019).

The requirement of inspection under shops and establishments has been removed. Procedures for starting the business have been reduced and the time taken to set up a business has been halved. (DIPP, 2019)

Indicator: Starting up a Business					
Year	2015	2016	2017	2018	2019
Rank	158	155	155	156	137

Table 2: Rank under Starting up Business Parameter from 2015 to 2019

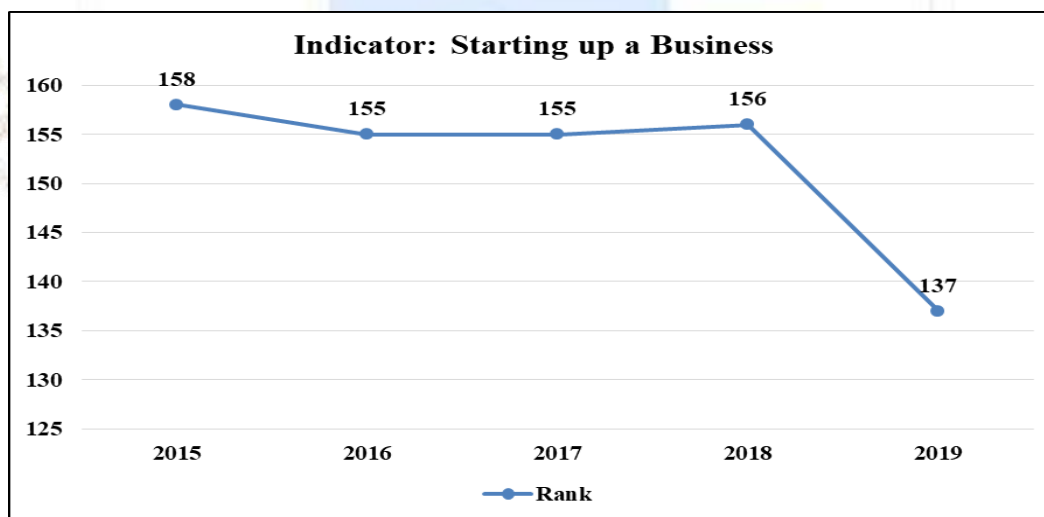


Fig 6: Rank under Starting up Business Parameter from 2015 to 2019

The ranking shows not a significant improvement in the time frame of 5 years. This shows that a lot needs to be done in terms of the policy to make a significant rise in the rankings

#### 4.2.2 Permit for construction

The process of obtaining construction permits has been streamlined to an online single-window system. The procedures and time has been reduced compared to earlier. Building quality control index has also improved. The cost involved in the process also has been significantly reduced. (DIPP, 2019)

"Risk-based classification of buildings has been introduced for fast-tracking building plan approval, inspection, and grant of occupancy-cum-completion certificate. The requirement of submitting notarized certificates or affidavits for building plan approval has been replaced with e-undertaking in Delhi. Multiple inspections at the completion stage have been replaced by a single joint inspection in Delhi. Road cutting and restoration for water and sewer connections have been simplified." (PIB, 2019)

Indicator: Permit for Construction					
Year	2015	2016	2017	2018	2019
Rank	184	183	185	181	52

Table 3: Rank under Permit for Construction Parameter from 2015 to 2019

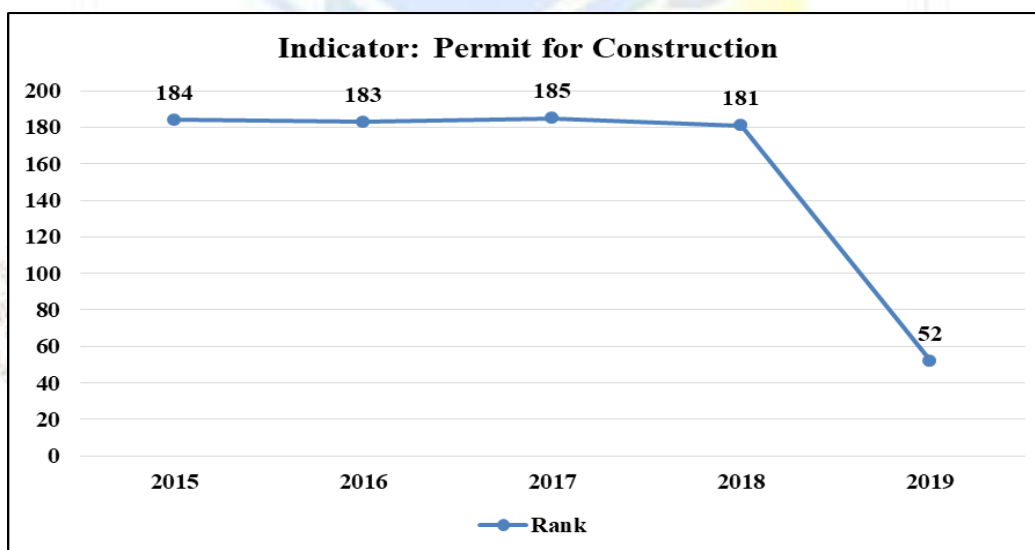


Table 7: Rank under Permit for Construction Parameter from 2015 to 2019

There is a significant and drastic improvement in the ranking under the indicator. The performance is commendable and should sustain the same.

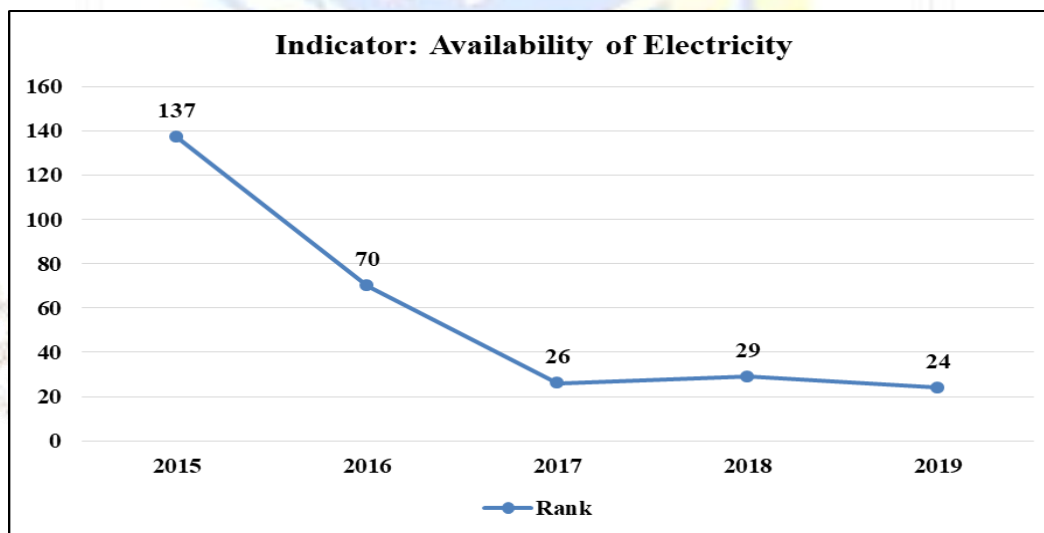
### 4.2.3 Availability of electricity

The cost to obtain electricity has been significantly reduced. So much so that more than half the cost has been reduced; this gives a major relief for the entrepreneurs to reduce their initial inception costs. Adding to this the time requirement has been reduced as well. (DIPP, 2019)

"Procedures for internal wiring inspection by the Electrical Inspectorate (in Delhi) have been eliminated. In Delhi, service line charges have been capped at INR 25,000/- in electrified areas for Low Tension loads up to 150 KW. Time taken by the utility to carry out external connection works has been reduced in Delhi." (PIB, 2019)

Indicator: Availability of Electricity					
Year	2015	2016	2017	2018	2019
Rank	137	70	26	29	24

**Table 4: Rank under Availability of Electricity Parameter from 2015 to 2019**



**Table 8: Rank under Availability of Electricity Parameter from 2015 to 2019**

There is a substantial rise in the rank and it can be seen that the improvement is consistent after the year 2017. The consistency in the ranking has to be sustained.

#### 4.2.4 Property Registration

The indicator finds very less mention in the reports produced by the government. It can be acknowledged to the complexity of the issue of private property both acquisition and compensation. Further, this can be attributed to delays in the process and various pressure groups involved in the process. There isn't any specific policy initiative showcased in this regard since the subject 'Land' is a state subject except for the National capital region of Delhi as per the Constitution of India.

Indicator: Property Registration					
Year	2015	2016	2017	2018	2019
Rank	121	138	138	154	166

Table 5: Rank under Property Registration Parameter from 2015 to 2019

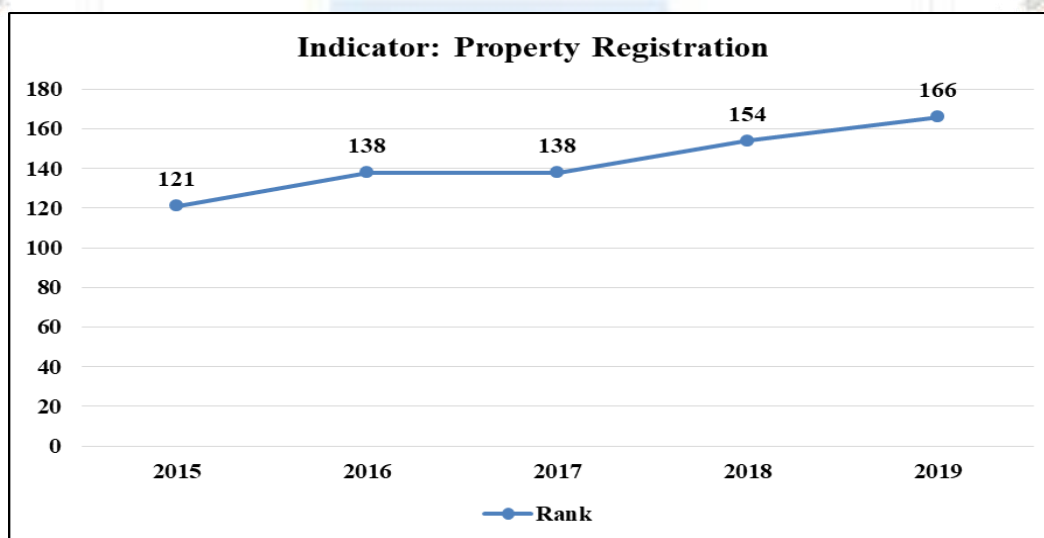


Table 9: Rank under Property Registration Parameter from 2015 to 2019

The above data seems very interesting among the indicators which improved. This indicator stands apart owing to its deterioration in the ranking. This shows that appropriate measures taken through public policy are required.

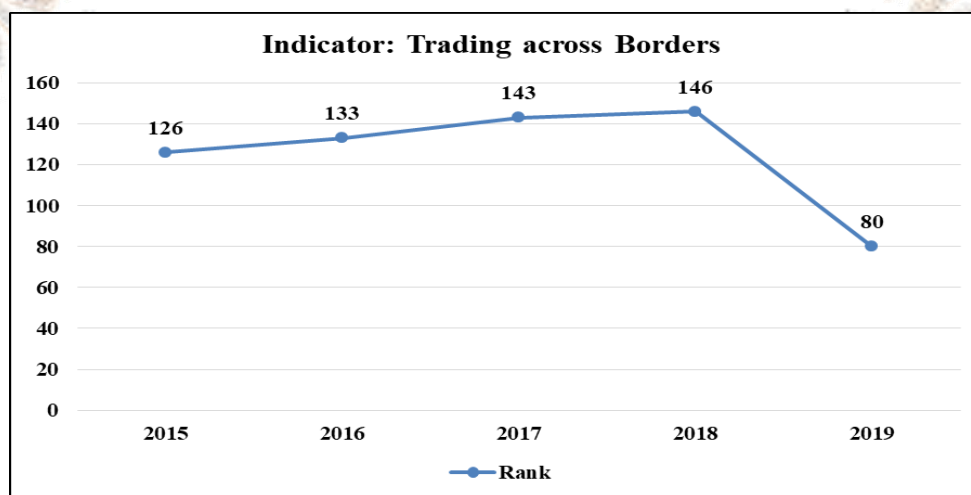
#### 4.2.5 Trading across border:

A robust Risk management system has reduced inspections. Electronic sealing of the containers enabled faster movement of goods (DIPP, 2019). The indicator has fairly performed in both documentary compliance and border compliance among Imports as well as Exports.

Implementation of an online application system - e-Sanchit, under the initiative of Single Window Interface for Trade (SWIFT), allows traders to submit with digital signatures all supporting documents electronically. This initiative helps in importing key infrastructure such as capital goods and electronic machinery (PIB, 2019).

Indicator: Trading across Borders					
Year	2015	2016	2017	2018	2019
Rank	126	133	143	146	80

**Table 6: Rank under Trading across Border Parameter from 2015 to 2019**



**Table 10: Rank under Trading across Borders Parameter from 2015 to 2019**

There seems to be an improvement in the ranking but it may not be considered something significant. Still, there need policy efforts to be put in to ensure further improvement.

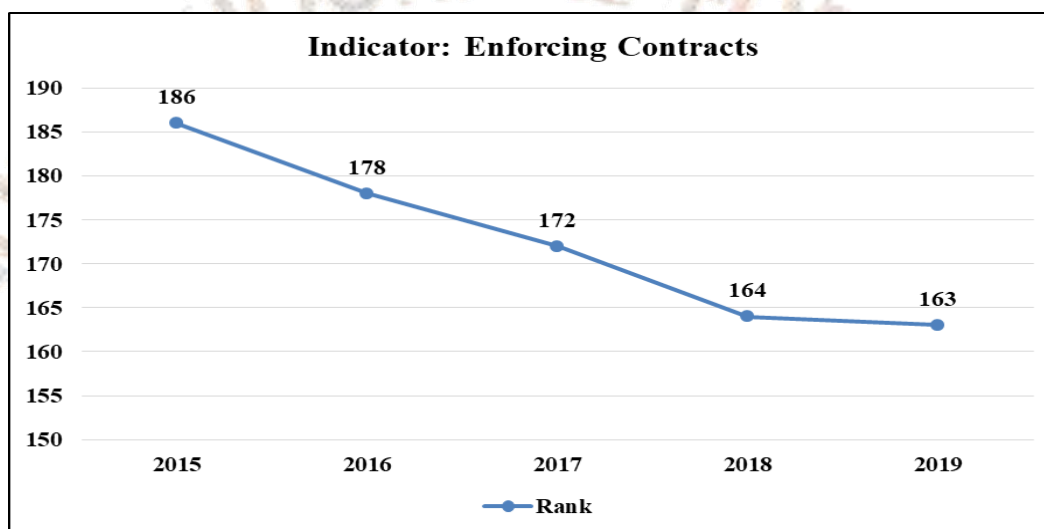
#### 4.2.6 Enforcing Contracts

"National Judicial Data Grid has been introduced which makes it possible to generate case measurement reports on local courts. The Commercial Courts Act 2015 has been amended to reduce the pecuniary jurisdiction of commercial courts from INR 1 crore to INR 3 lakhs to establish commercial courts at the District Level. This will help in speedier disposal of commercial disputes and reduce pendency" (PIB, 2019). Constitution of National Company Law Tribunal (NCLT) and National Company Law Appellate Tribunal (NCLAT): As per

the Companies act 2013 and further amendments for the same. The Union cabinet constituted NCLT & NCLAT (PIB, 2015). All of these ensure the speedy disposal of litigations related to companies (Kaveri, 2017)

Indicator: Enforcing Contracts					
Year	2015	2016	2017	2018	2019
Rank	186	178	172	164	163

**Table 7: Rank under Enforcing Contracts Parameter from 2015 to 2019**



**Table 11: Rank under Enforcing Contracts Parameter from 2015 to 2019**

Though there seems some minuscule improvement in the ranking there are a lot of policy efforts required to improve this indicator. This indicator can be considered one of the least performing.

#### 4.2.7 Resolving Insolvency:

To give impetus for improvement in insolvency-related litigations the Insolvency and Bankruptcy Code (IBC) 2016 was brought about by the executive of the Government of India.

"Enactment and implementation of the code will not only improve the Indian ranking on the world map in ease of doing business but also it will improve credit market, GDP growth, FDI and business environment as a whole" (Wadhwa, 2017).

The code introduced a reorganization procedure for corporate debtors and facilitates the continuation of the debtors' business even during insolvency proceedings. Under the IBC professional institutions have been proposed to be established for the effective handling of restructuring and insolvency proceedings (Vidhi, 2019).



The objective of the code is not liquidation but the resolution in a time-bound process. Further, the interests of the creditors are safeguarded through the concern undergoing the insolvency procedure (PIB, 2016).

Indicator: Resolving Insolvency					
Year	2015	2016	2017	2018	2019
Rank	137	136	136	103	108

Table 8: Rank under Resolving Insolvency Parameter from 2015 to 2019

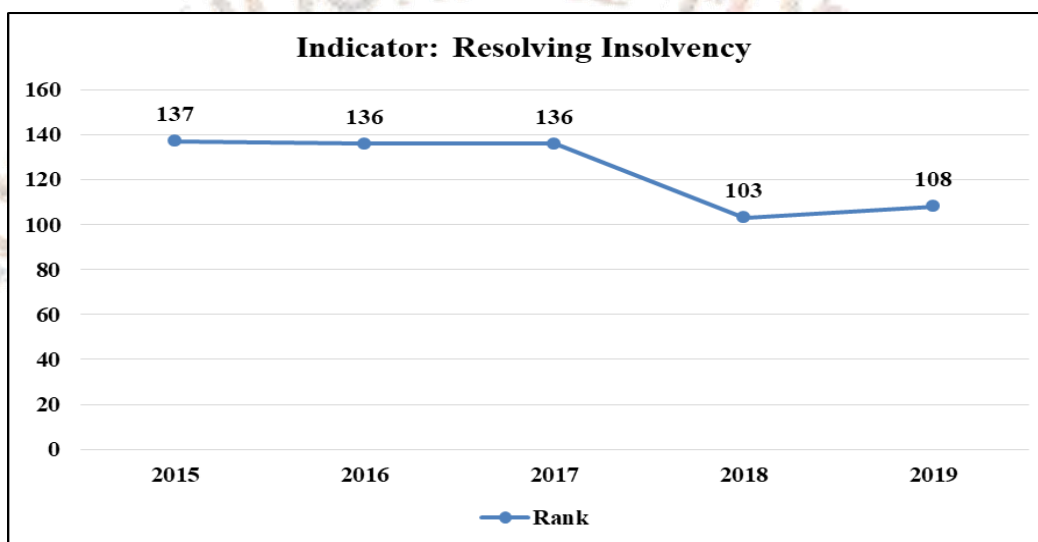


Table 12: Rank under Resolving Insolvency Parameter from 2015 to 2019

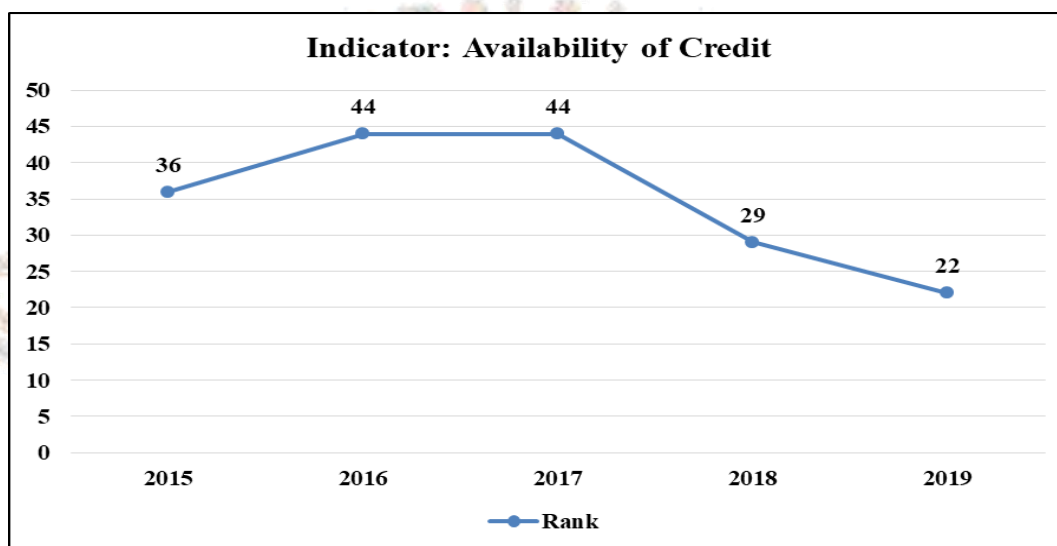
The domain of insolvency was relatively untouched till the IBC, 2016 was brought in. It can also be seen that after the code was passed there has been improvement in the ranking. But the rise in the ranking is not satisfactory. The bottlenecks involved in the implementation aspect of the policy must be taken care of.

#### 4.2.8 Availability of Credit

The government reports that explicitly mention the policy initiatives have limited themselves to showcasing any policy interventions specific to getting credit. But it can be acknowledged that the parameter has linkages with other parameters such as insolvency and safeguarding the interests of the creditors during the process of insolvency.

Indicator: Availability of Credit					
Year	2015	2016	2017	2018	2019
Rank	36	44	44	29	22

**Table 9: Rank under Availability of Credit Parameter from 2015 to 2019**



**Table 13: Rank under Availability of Credit Parameter from 2015 to 2019**

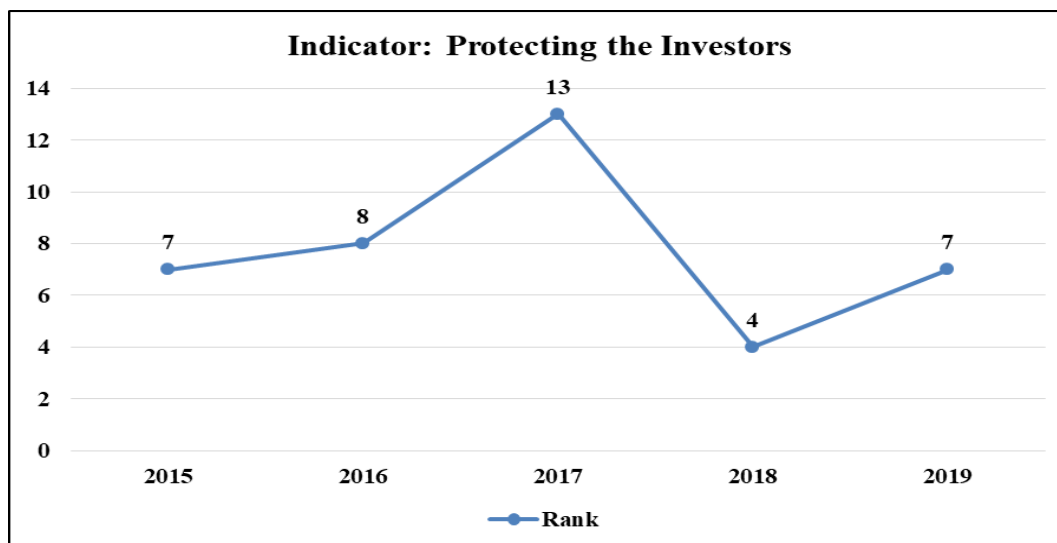
The above data shows that there is a fair improvement in the ranking. It also seems that the parameter has been performing well owing to the penetration of the Banking & Financial system.

#### 4.2.9 Protecting the Investors

"Secured creditors are paid first during business liquidation, and hence have priority over other claims such as labor and tax" (PIB, 2019)

Indicator: Protecting the Investors					
Year	2015	2016	2017	2018	2019
Rank	7	8	13	4	7

**Table 10: Rank under Protecting the Investors Parameter from 2015 to 2019**



**Table 14: Rank under Protecting the Investors Parameter from 2015 to 2019**

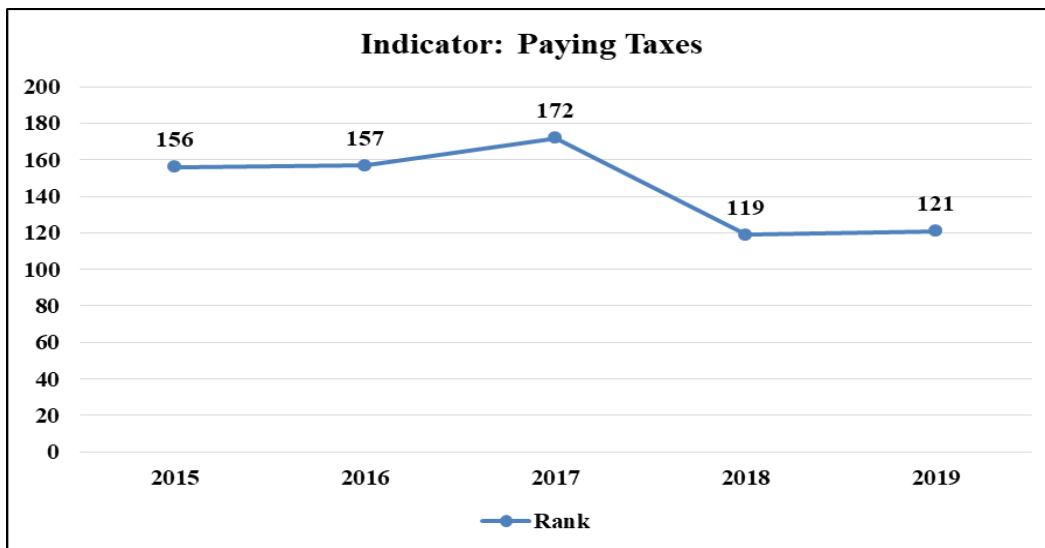
The data reveals there has been a fluctuation in this parameter but at the end of the 5 years, there isn't any change in the ranking. A better policy effort will ensure consistent improvement in the ranking of the parameter.

#### 4.2.10 Paying Taxes

“17 indirect Central and State taxes have been replaced with a single indirect tax, Goods and Service Tax (GST), for the entire country. The previous sales taxes including the central sales tax, CENVAT, state VAT and the service tax have been merged into the GST. Unification of these taxes will reduce the cascading effect of taxes and make taxes paid on inputs creditable to a higher percentage. Corporate income tax has been reduced from 30% to 25% for companies with a turnover up to INR 250 crore. Electronic System for payment of Social Security Contributions has been introduced enabling easier return payment. Payment of EPF has been made mandatory electronically. Administrative charges on The Employees' Provident Funds Scheme, 1952 (EPFS) were reduced in March 2017 from 0.85% to 0.65% of the monthly pay. The Employees' Deposit Linked Insurance (EDLI) administrative charges of 0.01% have been removed” (PIB, 2019)

Indicator: Paying Taxes					
Year	2015	2016	2017	2018	2019
Rank	156	157	172	119	121

**Table 11: Rank under Paying Taxes Parameter from 2015 to 2019**



**Table 15: Rank under Paying Taxes Parameter from 2015 to 2019**

The domain of taxation plays a vital role in the finances of the business. Handling the taxation procedures and the litigation arising would impact investor confidence. From the data, it can be seen that though there is some improvement in the indicator it is very much required to put more policy efforts to ease the process.

#### 4.2.11 Observation on the Public Policies for Business Ecosystem in India

When the policy parameters under the Ease of Business dimension are benchmarked at the 100th Rank; Under the Ease of Business dimension it can be understood that 'Permit for construction', 'Availability of Electricity', and 'Trading across Borders' are faring well as compared to 'Starting a Business', 'Property Registration', 'Enforcing Contracts', 'Resolving Insolvency'. Further 'Availability of Credit' and 'Protecting the Investors' are also relatively faring well as compared with the parameter of 'Paying Taxes'. Overall there are two parameters 'Property Registration' and 'Enforcing Contracts' which are the least performing among all the other policy parameters.

### 5. Observation & Suggestion for Development of Public Policies towards Technoentrepreneurship in India

There is a need to record relevant comprehensive information related to digital enterprises, e-commerce platforms, and start-up activity in the country. The database shall include all such data which helps the policymakers to understand the implications of the policies oriented toward entrepreneurship. A nodal agency for the purpose must be identified to capture and release the data periodically.

A lot needs to be done to ensure that needs such as infrastructure, safety, and esteem are to be fulfilled. Specific policies are required to enhance social needs also. There are discrete policy initiatives however they are not enough to galvanize the momentum for a vibrant Digital Ecosystem.

The parameters such as 'Property Registration' and 'Enforcing Contracts' must be the prime focus among others to ensure a relative improvement for an optimistic business Ecosystem.

## 6. Conclusion

The term and the phenomenon associated with Technoentrepreneurship is quite a new addition to the area of research in entrepreneurship. However, it has its own social and economic importance in the 21st Century. In the era of continuous technological development, particularly in mobile technologies, social media, analytics, cloud computing, and quantum computing – thousands of new business models are emerging under the broader umbrella of Technoentrepreneurship. In this context, it is expected that the Government, through public policy, creates a conducive environment for the growth and development of Technoentrepreneurship.

The extensive literature review on the niche topic of Public Policy in Technoentrepreneurship revealed that there isn't any substantial theoretical base for the identification and development of public policies in the domain of Technoentrepreneurship. There is a very thin body of literature surrounding the dimension of public policy identification, analysis, and development. As the knowledge of the theoretical base for Technoentrepreneurship is very essential, this study helps readers to prepare the ground to initiate the discussion in this area.

The Two-Factor Model of Technoentrepreneurship (Fig 2) is proposed to be the theoretical base for the identification and development of public policies in the domain of Technoentrepreneurship. The Model has two fundamental dimensions: Digital Ecosystem and Business Ecosystem. For a deeper understanding of the Digital Ecosystem, the Needs Model for Digital Ecosystem (Fig 3) is designed. Further, for a deeper understanding of the Business Ecosystem, the Ease of doing business index (Fig 4) is adopted.

The theoretical framework developed is applied for the discussion & analysis of public policies related to Technoentrepreneurship in India. It was found that there is only limited measurable statistical information on the list of policies and their evaluation of the content, implementation, and impact on digital enterprises in India.

After a careful investigation, a total of five policies under the Digital Ecosystem and a total of ten policy parameters under the Business Ecosystem have been listed and analyzed. Based on the analysis certain suggestions have been made for the development of public policies under Technoentrepreneurship in India.

In the process of screening the public policies, it was observed that several efforts were put in by the Government of India to build confidence in the digital startup ecosystem in the country. However, all of them did not qualify for the present study. The policies which are not legislations are only executive intentions and not justifiable in a court of law. To build confidence in the Technoentrepreneurship ecosystem, concrete legislation has to be brought in and the gap areas have to be filled to enhance confidence among the various stakeholders involved in the activity of Technoentrepreneurship.

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