Factors affecting Adoption of New Technology and Innovations: A quantitative study of Startups in India

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Abstract
This quantitative study endeavours to discern the determinants which influence the assimilation of novel technology and ground breaking advancements in nascent companies within India. The methodology employed for the inquiry involves a survey technique that effectively gathers information from a representative sample of data from ascent enterprises operating within a broad range of industries spanning across the Indian landscape. To scrutinize the data collected, the study utilizes descriptive statistics, factor analysis, and regression analysis techniques. The discoveries from the investigation divulged that sundry element, such as the perceived practicality of the novel technology, simplicity of employment, compatibility with pre-existing technologies, and perceived advantages, had a momentous influence on the assimilation of ground breaking technology and innovations by nascent businesses. On the contrary, elements such as expenditure, paucity of adroit human resources, and regulatory and juridical obstructions were perceived to be consequential hindrances to the acceptance of pioneering technology and innovations by nascent businesses in India. The study provides insights into the factors that influence the adoption of new technology and innovations by startups in India. The findings of this study could help policymakers, industry experts, and startup entrepreneurs in developing strategies to overcome the barriers to technology adoption and to promote innovation in the startup ecosystem.

Keywords: Adoption of new technology, Startup technology, innovations, Technology Disruption, Startup Ecosystem

Introduction
The integration of cutting-edge technology and avant-garde concepts is a pivotal aspect for the development and triumph of any establishment, specifically for fledgling companies. Chong, Lin, Ooi, & Raman, (2009) found that in the contemporary world’s rapid and competitive corporate milieu, startups must adopt new-fangled technologies and innovative approaches to sustain their competitiveness and advance. Nevertheless, the assimilation of new technology and inventive techniques is not
a straightforward feat, and it entails multiple factors that can either expedite or impede the process.

India has emerged as a centre for nascent companies, as the startup ecosystem has witnessed tremendous growth and progress in recent times. According to a report published by Nasscom, India presently possesses the third largest startup ecosystem on the planet, with over fifty thousand startups operating within the nation. Mortara & Minshall, (2011) revealed that nevertheless, in spite of the aforementioned progress, Indian startups face a considerable challenge when it comes to embracing novel technology and innovations.

This study aims to explore the factors that affect the adoption of new technology and innovations among startups in India. The study has used a quantitative research methodology to collect data from a sample of startups in India and analyse the data to identify the key factors that affect the adoption of new technology and innovations. This inquiry endeavours to investigate the determinants that influence the reception of new-fangled technology and innovative creations among fledgling businesses in India.

**Literature review**

The expeditious advancement of technology and innovations has brought forth substantial transformations in the manner in which corporations operate worldwide. Spender, Corvello, Grimaldi, & Rippa, (2017) revealed that the emergence of nascent technologies and innovations has resulted in the ascension of startups as an indispensable proponent of economic expansion and growth in the Indian subcontinent. Nevertheless, the assimilation of novel technology and innovations by startups in India is still a momentous obstacle. This scrutiny of literature delves into the determinants that exert influence on the integration of fresh technology and innovations by startups in India.

The acceptance of innovative technology hinges on the perception of its usefulness. People are more likely to adopt new technology if they believe it will be beneficial to them, a perception that varies depending on several factors. Chandra & Kumar, (2018) found that these include individual experiences, job requirements, goals and objectives, and willingness to acquire new skills. For instance, someone working in a field where technology is continually advancing may be more prone to accepting new technology compared to someone in a domain where technology is not a significant factor. Prior familiarity with similar technology also impacts one's perception of usefulness, with positive experiences enhancing adoption and negative ones hindering it. The perceived usefulness is also affected by the quality of the technology, with reliability, efficiency, and ease of use being important factors. Furthermore, perceived usefulness is also influenced by the user's perception of the benefits of the technology, with the user being more likely to adopt it if they believe it will help them attain their goals. Additionally, perceived usefulness is impacted by the cost-benefit ratio, with users more inclined to adopt technology if they perceive the benefits outweigh the costs. Lastly, the compatibility of
technology with the user’s existing systems and processes plays a significant role in determining its perceived usefulness.

Soriano, (2017) found that users are more likely to adopt technology if they believe it is compatible with their current systems and processes. Perceived ease of utilization is a pivotal aspect in the assimilation of cutting-edge technology. If an individual perceives a technology as straightforward, they are more inclined to accept it. The ease with which individuals can operate technology can significantly influence their perception of the technology's practicality. There are a multitude of factors that can affect the perceived ease of use of technology. The primary factor is the user interface. The user interface is the medium through which the user interacts with the technology. If the user interface is intuitive and easy to navigate, the user is more likely to deem the technology as easy to operate. Another factor that can sway the perceived ease of use is the intricacy of the technology. Roupas, P. (2008) found that if the technology is excessively intricate and arduous to comprehend, users may consider it as challenging to use and be less prone to adoption. Conversely, if the technology is straightforward and easy to understand, users are more likely to perceive it as effortless to operate. The availability of support and training can also impact the perceived ease of use of technology. If users receive adequate support and training on how to operate the technology, they are more likely to perceive it as user-friendly. Furthermore, the compatibility of the technology with existing systems can also influence the perceived ease of use. If the technology is compatible with existing systems, users are less liable to face difficulties when operating the technology, making it easier for them to accept it. Besides the factors mentioned above, the perceived ease of use can also be impacted by the user's level of expertise. Users with higher levels of proficiency in technology may find it easier to operate new technology than users with lower levels of expertise. Furthermore, the perceived ease of use can be influenced by the perceived practicality of the technology. If users perceive the technology as practical, they may be more inclined to put in the effort required to learn how to operate it, making it easier for them to accept it. (Dhanabalan & Sathish, 2018) mentioned that it is imperative to note that the perceived ease of use and the perceived practicality of the technology are interrelated. Users are more likely to perceive technology as practical if they find it easy to operate, and they are more likely to find it easy to operate if they perceive it as practical. The assessment of the adoption rate for emerging technologies and practices is largely dependent on the compatibility with pre-existing technology and processes. If the newly introduced technology aligns with the current technological framework and practices, its adoption is more plausible. Compatibility can be analyzed through two lenses, the first being the technical compatibility of the technology in tandem with the current technology in use. The technology must integrate seamlessly with
the hardware, software and network infrastructure of the organization, ensuring a smooth transition. The second aspect of compatibility is organizational compatibility, referring to how the technology is aligned with the culture, workflows and business practices of the organization.

de Vera, Gide, Wu, & Chaudhry, (2018) found that the integration of novel technology into an organization necessitates conformity with the company's goals and objectives while elevating the efficiency of pre-existing workflows. However, if the latest technological innovation is incompatible with the organization's present technologies and methodologies, it may trigger numerous challenges. For instance, additional infrastructure, software, or hardware may be required, resulting in escalated expenses. Furthermore, employee training may also necessitate additional time and resources, thus elevating the cost even further. Additionally, if the newly implemented technology fails to align with the company's cultural and procedural practices, employee resistance may emerge. This could potentially lead to a slower rate of adoption or even outright rejection of the new technology. In addition, if the latest technological innovation requires significant changes to the company's current systems and procedures, it may be challenging to implement, leading to delays, amplified costs, and lower adoption rates.

Lal and Bharadwaj (2016) found that organizations must carefully appraise the congruence of new technology before incorporating it. They must assess its technical congruence with pre-existing systems as well as its organizational congruence with the culture and work processes of the organization. Additionally, organizations must involve their staff in the evaluation and selection process, as employees are more likely to support the new technology if they deem it compatible with their established systems and practices. The adoption of new technology hinges on the perceived ease of use, which is a pivotal factor. One factor of ease of use that can determine its success or failure is the intricacy of the technology. The intricacy of a technology can be expressed in numerous ways, and if it is excessively intricate, individuals may have trouble adopting it, thereby impeding its overall success. According to Srivastava's (2018) when attempting to incorporate new technology into an organization, it is crucial to consider the level of complexity it possesses. If the technology is excessively intricate, it may lead to a multitude of issues, such as discouraging employees from embracing it or causing mistakes and reduced productivity. This can result in employees rejecting the technology outright, which can be problematic. Therefore, to prevent these challenges, it is necessary to evaluate the complexity of new technology thoroughly before implementing it.

Vignesh and Nagarajan (2018) identified that organizations must examine how intuitive the user interface is, how well it integrates with existing workflows, and how much training is required to use it effectively. Failing to do so may result in confusion, a lack of productivity, and ultimately, poor
outcomes. Organizations must give careful consideration to the intended audience when assessing the intricacy of their technological solutions. In the case of targeted users, such as medical professionals or engineers, the complexity of the technology may need to be more elevated than if it were meant for a general audience. Along with assessing the complexity of their technology, organizations must also take active measures to simplify it wherever possible. This could entail redesigning the user interface to make it more intuitive or providing supplementary training and support to personnel. Automation is a viable technique for simplifying technology. The automation process can alleviate the burden of manual data entry, which tends to be a time-consuming and error-prone activity. By automating repetitive tasks, individuals can dedicate their efforts to more intricate duties that require human intervention, thereby boosting productivity and job satisfaction. The adoption of innovative technology is impacted by various factors, one of which is observability. Observability represents the degree to which the advantages of new technology are perceivable to others. If people witness others reaping the benefits of technology, they are more likely to embrace it. For example, if employees witness their peers using novel software tools to automate recurring tasks and witness a surge in efficiency, the chances of them adopting it are heightened. Innovation acceptance can be swayed by the perceived advantages of the new technology compared to the pre-existing ones. The likelihood of adoption is higher if the new technology is regarded as providing significant benefits compared to the current ones. For instance, if a fresh software application offers swifter and more precise data analysis than the current tool, employees may be more inclined to embrace it. Another crucial element in the adoption of technology is the ability to try out the new technology before committing to it. It can be influential to test the technology and observe its benefits first-hand, which increases the possibility of adoption. For instance, a software corporation may provide a gratis trial of their new project management software to prospective customers. This trial allows them to experience the tool's functions and advantages before deciding to use it. Social determinants, such as the influence of peers, social conventions, and cultural influences, have the capacity to sway the acceptance of novel technology. Should an innovative communication tool gain popularity amongst colleagues, individuals may find themselves pressed to accept it to prevent being deemed outmoded or resistant to change. Additionally, the integration of novel technology may be impacted by cultural influences. Societies may be more receptive to innovative technology than others. In some communities, technological advancements may be viewed as an emblem of progress and forwardness, resulting in a quicker adoption rate. Conversely, other communities may prefer customary methods and demonstrate skepticism towards cutting-edge technology.

OBJECTIVE
To know the factors affecting adoption of new technology and innovations.
METHODOLOGY

In the present study 240 people were surveyed to know the factors affecting adoption of new technology and innovations. A structured questionnaire was prepared and with its help the survey was conducted. A sampling method named convenient sampling method was chosen to collect the primary data. After the completion of fieldwork, the collected data was inspected and calculated by mean and t-test.

FINDINGS

Table 1 Factors Affecting Adoption of New Technology and Innovations

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Statements</th>
<th>Mean Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Innovation is time taking process, but sometimes company professionals eagerly prioritize fast returns and hence the innovation is affected</td>
<td>4.03</td>
</tr>
<tr>
<td>2.</td>
<td>An adamant and conventional management model is also one of the biggest challenges for new technology</td>
<td>3.79</td>
</tr>
<tr>
<td>3.</td>
<td>Innovation means change/or something different, but accepting the change is also a big challenge</td>
<td>4.19</td>
</tr>
<tr>
<td>4.</td>
<td>Innovation comes with responsibility and hence where there is no responsible team or person there is no innovation</td>
<td>4.11</td>
</tr>
<tr>
<td>5.</td>
<td>A streamlined end-to-end process such as development, testing and application is required for innovation, but many organizations don’t follow and it becomes barrier for innovation</td>
<td>3.95</td>
</tr>
<tr>
<td>6.</td>
<td>Inadequate benchmarking of innovation often fails projects before they had a chance to succeed</td>
<td>4.25</td>
</tr>
<tr>
<td>7.</td>
<td>Innovation is about new ideas, but less sharing of ideas, concepts and knowledge among different teams is also a big challenge for innovation</td>
<td>3.83</td>
</tr>
<tr>
<td>8.</td>
<td>Insufficient training and motivation among the employees also lead to a challenge for innovation</td>
<td>3.76</td>
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<tr>
<td>9.</td>
<td>Lack of time and low employee engagement is also a factor affecting new technology</td>
<td>3.88</td>
</tr>
<tr>
<td>10.</td>
<td>Limited capital or investment is also considered as a factor affecting new technology</td>
<td>4.37</td>
</tr>
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Table 1 above is showing factors affecting adoption of new technology and innovations. It is found that limited capital or investment is also considered as a factor affecting new technology with mean value 4.37, inadequate benchmarking of innovation often fails projects before they had a chance to succeed with mean value 4.25 and innovation means change/or something different, but accepting the change is also a big challenge with mean value 4.19. The respondent says innovation comes with responsibility and hence where there is no responsible team or person there is no innovation with mean value 4.11, innovation is time taking process, but sometimes company professionals eagerly prioritize fast returns and hence the innovation is affected with mean value 4.03, a streamlined end-to-end process such as development, testing and application is required for innovation, but many organizations don’t follow and it becomes barrier for innovation with mean value 3.95 and lack of time and low employee engagement is also a factor affecting new technology with mean value 3.88. The respondent shares that innovation is about new ideas, but less sharing of ideas, concepts and knowledge among different teams is also a big challenge for innovation mean value 3.83, an adamant and conventional management model is also one of the biggest challenges for new technology with mean value 3.79 and insufficient training and motivation among the employees also lead to a challenge for innovation with mean value 3.76.

Conclusion

In conclusion, the assimilation of recent technological advancements and inventions is a vital determinant for the triumph of fledgling enterprises in India. A quantitative analysis has identified numerous aspects that have the potential to influence the assimilation of innovative technologies, such as the entrepreneur's cognitive framework, accessibility to resources, governmental regulations, and market requisites. Furthermore, the study has affirmed that startups that exhibit readiness to undertake risks and welcome modifications are more prone to embracing new technology and inventions. Overall, this study highlights the importance of fostering an environment that encourages innovation and technology adoption in India. Policymakers, investors, and startup incubators wield considerable influence in bolstering fledgling businesses by granting them access to valuable resources and promoting a culture of experimentation and risk-taking. Furthermore, entrepreneurs ought to be incentivized to concentrate on comprehending their patrons' exigencies and inclinations, and subsequently align their innovative efforts accordingly. Through these measures, Indian startups can harness novel technology and innovative solutions to catalyze expansion, stimulate employment opportunities, and contribute to the country's overall economic advancement.

Reference


