

Potential of digital technologies in academic entrepreneurship – a study

Academic
entrepreneurship

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Abstract

Purpose – Digital technologies have become indispensable in businesses and are gaining attention in academic institutions context too. Digital technological ecosystems provide a platform to communicate and share their products and services to existing and potential customers. Entrepreneurial startups and companies face internal and external challenges utilizing social media technologies to commercialize their business ideas. The purpose of this paper is to identify opportunities and challenges faced by academic entrepreneurs' startups.

Design/methodology/approach – This research has adopted a qualitative approach comprising of semi-structured in-depth interviews with academic entrepreneurs' startups to find the main challenge they face using social media platforms. The purpose was associated with an exploratory type of study and also included a prominent unified theory of acceptance and use of technology (UTAUT) and technological opportunism (TO) model. The research respondents were 23 academic entrepreneurs startups who were chosen applying purposive sampling. Respondents were given a set of a questionnaire consisting of close-ended questions that are five-point Likert scale. The questionnaire included various parameters to measure the social media challenges the academic entrepreneurs' startups undergo in the initial phase of their businesses.

Findings – The study identified that business-to-customer relations, brand, reputation, competition and cultural and language influence digital technologies entrepreneurship. While, the findings discovered the extended research model has a positive influence on academic entrepreneurs' intentions to use digital technologies media platforms. The outcome of this paper has thrown more light on which issues are there in digital technologies entrepreneurship, the determinants and actual usage advantages from UTAUT model and TO model that could be properly employed to solve issues of digital technologies media platforms and the potential concerning the adoption and use of digital technologies.

Originality/value – The study of academic entrepreneurs' startups can be considered original in nature. There is dearth of standard literature in the upcoming area of academic entrepreneurship. Governments are taking initiatives to promote academic entrepreneurs' startups, and the findings will be able to give them a right direction.

Keywords Entrepreneurial orientation, Start-ups, Entrepreneurship, Institutions

Paper type Research paper

Introduction

Digital technologies have been instrumental in transforming businesses and society globally (Kraus *et al.*, 2019; Nambisan *et al.*, 2017; Zaheer *et al.*, 2019) and have gained extensive attention from researchers in the academic institutions context (Chrisman *et al.*, 1995). Digital technologies are opening up fascinating innovation opportunities for entrepreneurs (Yoo *et al.*, 2010). With digital technologies, entrepreneurs can develop new forms of entrepreneurial actions that move beyond the traditional industry boundaries to include networks and ecosystems and accelerating the evolution of new ventures (Huang *et al.*, 2017). These digital technology ecosystems provide entrepreneurs and their firms a platform to communicate and share their products and services to existing and potential customers broadly (Kraus *et al.*, 2019). One of the essential aspects of digital technology platforms now is



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social media assisting in innovations (Fitzgerald *et al.*, 2014). Manning (2014) addressed social media as a new form of media that involves interactive participation. Social media technologies' (e.g. Facebook, Twitter, Instagram) representation in academic entrepreneurs' startups has contributed immensely to the improvements across the business sectors. Digital technology has promoted a relatively new concept of digital academic entrepreneurship (DAC). DAC is a socio-economic and technological phenomenon and utilized for joining of traditional academic entrepreneurship, with an emphasis on leveraging new digital technologies in unique ways, shifting the conventional modes of academic entrepreneurship (Rippa and Secundo, 2019). DAC emphasizes that academic entrepreneur's startups could sustain the business with digital technologies like social media platforms (Facebook, Instagram) because these platforms give various opportunities in running their businesses. According to Brooks *et al.* (2014), social media renders activities with opportunities like competitive knowledge, and they are enhancing products, packaging and productive relationships with customers (Martin and van Bavel, 2013). Primarily, for this reason, digital technologies such as social media have gained distinct recognition in the modern concept of academic entrepreneurship; however, regardless of the attention, there are criticisms of difficulties associated with the use of social media (Martin and van Bavel, 2013).

Researchers examined the adoption and utilization of digital technologies platforms by entrepreneurs and managers in firms from Europe, Asia, America and Africa (Abdul and Mwasimba, 2017; Brooks *et al.*, 2014; Boyd and Ellison, 2007; Durkin *et al.*, 2013; Hayter *et al.*, 2017; Kraus *et al.*, 2019; Martin and van Bavel, 2013; Nakara *et al.*, 2012; Rahim *et al.*, 2015; Rao and Kothari, 2017; Tsitsi Chikandiwa *et al.*, 2013). Significant challenges these academic entrepreneurs encounter range from business idea induction to commercialization, maturity stage and sustaining the business utilizing technologies (Hayter *et al.*, 2017; Laukkanen, 2003; Rahim *et al.*, 2015). Rippa and Secundo (2019) emphasized on the impact and prospective challenges analyzed by prior researchers who studied the acceptance of digital technologies about business creation. They recommended further investigation of different perspectives of digital technologies toward academic entrepreneurship.

Based on this recommendation, no study has been conducted on AES opportunities and challenges using social media technologies as their central platforms promoting their startups, as per the best of our knowledge. Most AES use social media technologies to improve their startups as their primary platforms. However, they face both internal and external challenges utilizing social media technologies to commercialize their business ideas (Khajeheian, 2013). Startups, as a new growing business, embraced the latest technologies as a publicizing platform to compete with local and international competitors. Therefore, this paper intends to fill the research gap by finding answers to the research question (RQ):

RQ1. What are the significant issues relating to social media technologies faced by AES?

The focus of this study is specifically on academic entrepreneurs' startups (AES), as AES is gaining momentum and contributing to the emerging theory of digital technologies impacting the activities of academic entrepreneurs. It becomes essential to know the status of AES, the scope, and determine the pertinence of AES. In this study, we propose by referring to AES as a student or an alumni startup business that identifies an opportunity or idea and designs a product or service during study or researching, establishes, runs and grows a business for profit.

Students and alumni become entrepreneurs, sometimes providing resolutions to a challenge in their academic communities. Hence, this paper adopted AES owners in India who took the initiative out of an opportunity, courage, confidence and to reach the exposure through the knowledge they have gained in an institutional technology community. These AES' owners intended to be independent, and the government initiative group promoting startups among academic institutions influenced them to become academic entrepreneurs.

The proposed work is an attempt to find out the issues related to the sustainability and growth of AES and to find out the challenges they face using social media platforms that can contribute to the accelerated way of developing the AES. The present research work considers 23 AES' functioning as formal startups in one of the premier technical institutes in India, Indian Institute of Technology (ISM) Dhanbad (IIT-Dhanbad). The outcome of this would encourage and lead activities, particularly emerging startups adopting specific digital technology platforms for promoting their businesses, more precisely in India.

This study will intensify the investigations of DAC and contribute to the academic community. More specifically, it will unveil the dynamics in the application of digital technology platforms. These activities will increase the awareness of budding startups (academic businesspeople) utilizing social media and have a better understanding of the technological hurdles for business, institutional bodies and entrepreneurs. Further, this study will add to the research examining the ongoing challenges and advantages of academic entrepreneurs in an emerging startup stage. Finally, to policymakers, the findings of this study will inform them of the various constraints faced by AES, which request them to give immense consideration in putting strategic plans to help AES.

The paper format includes an in-depth literature review and theoretical foundation, which highlights the objective, followed by the methodology and the findings and discussion. The final section discusses the conclusion, implications, limitations and future research.

Literature review

Academic entrepreneurship

The idea of entrepreneurship stems from the concept of new business creation as well as the expansion and growth of existing ones (Wood, 2011). Interestingly, university campus research has been the growing source for the ideas and core technologies that drive entrepreneurial endeavors (Wegner *et al.*, 2019). This idea and knowledge stemming from university research programs are useful for commercial applications, and revenue generation led to the coining of the term entrepreneurial university (Etzkowitz, 1998; Fuller and Pickernell, 2018). Rothaermel *et al.* (2007) described university entrepreneurship as forming a new business and running with a university involvement through incubation. The incubation centers at universities form an integral part of the business ecosystem that supports technical startups in the global economy (Hillemane *et al.*, 2019). The entrepreneurial university has also been described as a university that not only focuses on educational and research activities but also provides business start-ups through students and researchers to improve the economy of a country as a whole (Etzkowitz *et al.*, 2000; Fuster *et al.*, 2019; Gieure *et al.*, 2019). Entrepreneurial universities provide student-entrepreneurs with all the expertise and facilities needed to establish spinoffs and startups (Elia *et al.*, 2017). This idea of entrepreneurial universities is what has become embodied in a more focused concept called “academic entrepreneurship.”

Academic entrepreneurship is an evolving research field and has gained the interest of policymakers and researchers (Rothaermel *et al.*, 2007). Educational entrepreneurs recognize that their entrepreneurial activity came to a realization based upon individual vital relationships and knowledge from specific academics (Brennan *et al.*, 2005).

This idea highlighted the opportunities for academic entrepreneurial knowledge; for instance, a student or a researcher could be able to create a new startup, assist the progress of technology shift by incubators and other places after or the process of learning from academics. In essence, Samsom and Gurdon (1993) defined an academic entrepreneur as “student/academic whose primary occupation, before playing a role in a venture start-up, and possibly concurrent with that process, was that of a lecturer or researcher affiliated with Higher Education Institute.”

Academic entrepreneurship continues to evolve in different forms with time. Most researchers have drawn on five types of academic entrepreneurship, which takes the form of

large-scale science, supplemental income augmentation, industrial support for university science, patenting and direct commercial involvement (Laukkanen, 2003; Louis *et al.*, 1989).

Digital technology

Digital technology is transforming businesses (Kraus *et al.*, 2019; Nambisan *et al.*, 2017; Zaheer *et al.*, 2019), especially its fascinating innovation opportunities for entrepreneurs (Yoo *et al.*, 2010). Nowadays, firms have progressively implemented digital technology to respond positively to customer needs and improve customer-side operations as well. It supports the interests of consumers and businesses by helping firms drive sales and increase efficiencies and eventually reduce costs. With digital technologies, entrepreneurs can develop new forms of entrepreneurial actions that move beyond the traditional industry boundaries to include networks and ecosystems, thus accelerating the evolution of new ventures (Huang *et al.*, 2017). These digital technology ecosystems provide entrepreneurs and their firms a platform to communicate and share their products and services to existing and potential customers broadly (Kraus *et al.*, 2019). One of the essential aspects of digital technology platforms now is social media assisting in innovations (Fitzgerald *et al.*, 2014). Social media platforms are generating additional opportunities for entrepreneurs, and other organizations are also getting their activities more manageable (Rippa and Secundo, 2019). Through the usage of social media platforms such as LinkedIn, Facebook, Twitter, the firm's blogs render businesses' competitive knowledge (Brooks *et al.*, 2014). Furthermore, they are enhancing products, packing and productive relationships with customers. However, there is frequent criticism of difficulties associated with the use of social media (Martin and van Bavel, 2013).

Regardless of the recognition of these social media platforms, researchers have identified some challenges academic entrepreneurs encounter directly from business idea induction to commercialization, maturity stage and sustaining the business utilizing technologies. Moreover, they perceived that academic entrepreneurs might have to possess some entrepreneurial attitudes, skills and capabilities to control those challenges (Hayter *et al.*, 2017; Laukkanen, 2003; Rahim *et al.*, 2015). Overall, digital technologies play a significant part in almost every organization (Setia *et al.*, 2013) and have enabled cooperation among firms, information storage and analysis and improved customer service performance.

Opportunities/issues using digital technologies

Digitalization issues of entrepreneurial businesses are continuously changing Kraus *et al.* (2019). Furthermore, they tend to increase with the advancement of digital technologies. Various researchers examined the adoption and utilization of digital technologies platforms by business owners and managers. They found managerial issues such as workers getting distracted, lack of measuring the effectiveness and advantages, maintaining productive communication issues, less brand awareness (Abdul and Mwasimba, 2017; Brooks *et al.*, 2014; Durkin *et al.*, 2013; Martin and van Bavel, 2013; Sabraz Nawaz and Mubarak, 2015). Other managerial issues identified were lack of experienced technological expert, time-consuming, high cost of investment and lack of managerial approaches and strategies to handle social media platforms problems (Cawsey and Rowley, 2016; Culnan *et al.*, 2010; Leeftang *et al.*, 2014; Meske and Stieglitz, 2013; Nakara *et al.*, 2012; Tsitsi Chikandiwa *et al.*, 2013).

Entrepreneurs and managers in small firms from Europe, Asia and, America (Boyd and Ellison, 2007; Brooks *et al.*, 2014; Durkin *et al.*, 2013; Nakara *et al.*, 2012) examined other issues too. Researchers discovered internet access challenges, marketing information access issues, lack of resources, business owners' lack the experience to access social media platforms, lack of network structure and difficult-to-connect online and offline social media platforms.

Unsatisfactory participation in the discussions with customers on the social media platforms has been found not useful and causes problems in customer relations services (Harris and Rae, 2009). At the same time, reaching more customers is another big challenge.

Lack of trust, lack of transparency, customer resistance to use social media platforms, inability to discover customers' taste and preferences and lack of face-to-face interaction with customers (Abdul and Mwasimba, 2017; Brenkert, 2002; Brooks *et al.*, 2014; Cawsey and Rowley, 2016; Leeftang *et al.*, 2014; Sabraz Nawaz and Mubarak, 2015) are other issues.

Products and services branding and business reputation are essential for business (Tsitsi Chikandiwa *et al.*, 2013). For instance, obstacles such as negative comments and complaints by customers, equipping employees to handle negative feedback, in convincing with the content of information, coordination and direction between site agents. Moreover, inability to keep the consistency in voice tone of business messages and maintaining business reputation while power and control are giving away to customers were also indicated as obstacles when managing business brand and reputation (Brooks *et al.*, 2014; Cawsey and Rowley, 2016; Culnan *et al.*, 2010; Durkin *et al.*, 2013; Harris and Rae, 2009; Kaplan and Haenlein, 2010; Rao and Kothari, 2017; Sabraz Nawaz and Mubarak, 2015).

Information ownership has been an issue among big companies in the USA, as customers and others may perceive that criticism posted on companies' platforms signifies their opinions (Culnan *et al.*, 2010). Furthermore, in other studies, the basic concept of privacy, the refusal that comments posted on the respondent's social media pages do not represent the opinions of their business. Breaches of customer privacy and violation of the business guidelines or codes of conduct were privacy and security challenges (Boyd and Ellison, 2007; Culnan *et al.*, 2010; Durkin *et al.*, 2013; Harris and Rae, 2009; Kaplan and Haenlein, 2010; Martin and van Bavel, 2013).

Khajeheian (2013) observed that entrepreneurial enterprises utilizing technological, social media in Iran face severe competition from all over the globe. Martin and van Bavel (2013) also identified race as many organizations' primary concern. Another study has shown that competitors take advantage of marketing information of other businesses, which they shared on their social media platforms (Brooks *et al.*, 2014).

Technological infrastructure is essential for every firm. Khajeheian (2013) indicated that electronic payment infrastructure was challenging for some developing nations. Digital media presents numerous future advantages to companies, but lack of interoperability and less fitting technological infrastructure are challenges highly affecting the use of social media platforms and need intervention (Abdul and Mwasimba, 2017; Leeftang *et al.*, 2014; Martin and van Bavel, 2013).

Social media platforms of each firm in any country play an important role, contributing to all business stakeholders. Studies have noticed that local dialect and organizational culture and hierarchies create problems for companies using social media platforms (Martin and van Bavel, 2013; Meske and Stieglitz, 2013; Tsitsi Chikandiwa *et al.*, 2013). Appendix 1 summarizes the overall challenges of social media platforms.

Other studies suggested that academic entrepreneurs may be experiencing some other issues using digital technologies and that have become essential to the entrepreneurial environment (Kraus *et al.*, 2019; Rippa and Secundo, 2019). Other researchers identified managerial, business brand and reputation, competition, technological infrastructure and many more issues related to social media (Brenkert, 2002; Harris and Rae, 2009).

From the above literature, it is evident that the application of digital technology bids various benefits to the business. However, firms, managers and entrepreneurs face both internal and external challenges while utilizing digital technology platforms such as social media technologies to commercialize their business ideas (Khajeheian, 2013). AES could sustain with digital technologies like social media platforms (Facebook, Instagram) because these platforms give various opportunities for academic entrepreneurs to run their businesses. However, the challenges posed to them using social media platforms is an undeniable fact. Therefore, identifying the leading social media platform's problems of AES is needful.

Background of research theory

Plentiful research backs the unified theory of acceptance and use of technology (UTAUT) model being an outstanding model to describe the adoption of information systems and technology. Several empirical types of research recommended the UTAUT model (Renaud and Van Biljon, 2008; Zhou *et al.*, 2010). Studies have shown that the constructs used in the UTAUT model and technological opportunism are mostly the subsections of leading theories; hence, its applicability in a specific context may need some modification, and may well provide a much useful model than any individual standing or use (Goswami and Dutta, 2016; Nawi *et al.*, 2017; Serben, 2014; Venkatesh *et al.*, 2003; Zhou *et al.*, 2010). Three constructs of UTAUT adapted and extended to explore the use of the behavioral and responding capability of AES using technological platforms (social media).

Unified theory of acceptance and use of technology

UTAUT is an appropriate model playing a significant role to research the factors that influence the system or technology used by business owners (Curtis *et al.*, 2010; Goswami and Dutta, 2016; Nawi *et al.*, 2016, 2017; Nawi *et al.*, 2017). Entrepreneurial ventures in digital, information technology and media economy involve some specific opportunity recognition and making use of technology. Accordingly, owners require technology to try any manner of entrepreneurship activity to formulate and sustain their enterprises (Davidson and Vaast, 2010). Venkatesh and other authors formed the unified model, which describes the behavioral intention and technologies used. They emphasized that, from a theoretical viewpoint, UTAUT presents a clear illustration of how the “determinants of intention and behavior” emerge with time.

UTAUT applied in this study was formed through eight empirical models and combined to understand each construct of system adoption (Venkatesh *et al.*, 2003). The models are the motivational model (MM), technology acceptance model (TAM), combined model of TAM and TBP (C-TAM-TPB), theory of planned behavior (TPB), social cognitive theory (SCT), theory of reasoned action (TRA), innovation diffusion theory (IDT) and model of personal computer utilization (MPCU). UTAUT model holds four key constructs, called performance expectancy (PE), effort expectancy (EE), social influence (SI). The initial three constructs are the direct determinants of acceptance intention and use behavior, and facilitating conditions (FC) is a direct determinant of user behavior in utilizing the technology.

The study considers the influence of PE, SI and FC on social media platform usage among AES. The reason being that according to Venkatesh *et al.* (2003) and Davis (1989), PE is the most influential determinant of intention to adopt and apply a new structure and remains vital in all measuring settings, voluntary or mandatory. SI is when an individual understands and uses a particular new technology because of the advice and recommendation of key persons (e.g. peers, employees, family and friends) role or relationship with the owner. These key persons present a specific performance of a firm and proffer valuable guidance on a particular technology that can improve the effectiveness of the firm. Nevertheless, it is on to the individual to comply with any advice suggested by these critical persons. The connection between SI and the intention to use a system is active (Venkatesh *et al.*, 2003). Hence, SI plays a more vital role in this study to determine the influencers or reliant of AES' decision to use any technology. Another determinant in this study is FC, which could impact the use of social media in the firms of AES. Then FC, like the availability of proper technological infrastructure and personal resources, will support the use of technology (Venkatesh *et al.*, 2003).

A business owner perceives that adopting technologies by the recommendation of critical persons will enhance his business performance (PE) because of the availability of technological infrastructure and personal resources (such as skills and computers) to use social media platforms (Venkatesh *et al.*, 2003).

Social media performance expectancy

Social media PE (SMPE) in this study is the extent to which an AES is utilizing some specific social media platforms that will enhance their business performance. Venkatesh *et al.* (2003) defined PE as “the degree to which an individual believes that using the system will help him/her to attain gains in job performance.” The theory behind this is that a firm’s performance can be improved and be productive by the use of a particular technology (Venkatesh *et al.*, 2003). AES gets the opportunity to share information about the business to the mass at a go, which is the performance on the acceptance and use of social media platforms. These entrepreneurs believe that social media platforms help make their tasks easy and faster. Undoubtedly, utilizing social media platforms to perform business tasks will provide the AES the benefits of increasing productivity, be efficient, reaching the mass, less cost of money and time saving. Therefore, the proposition here is that this key determinant, SMPE, would play a prominent role in influencing AES usage behavior of social media platforms. Individuals who perform business activities on social media platforms are to be observant to the advances in digital technologies platforms, and its benefits, this could give them an opportunity and be productive. Furthermore, Venkatesh *et al.* (2003) observed that PE has an actual impact on financial service and retail industries using technology managing the businesses.

Contrary to the assertions above, Mandal and McQueen (2012) found no empirical proof extending and testing the UTAUT model on the adoption of social media among small businesses that PE positively relates to the intention to use social media. Through legal action research, the study found PE is not significant concerning the adoption of social media like Facebook by small businesses.

On the other hand, other studies discovered a small or the most substantial direct significant effect of PE on the intention to use social media sites (Curtis *et al.*, 2010; Nawi *et al.*, 2017; Sledgianowski and Kulviwat, 2009). Meaning, the researchers discovered that PE has a positive effect on the business owner-managers’ intention to use social media sites. When they perceive that utilizing the sites provides them with different benefits, their intentions to use these sites increases, not when they less doubt the impact of social media sites.

Peers social influence

In this study, peer social influence (PSI) is the extent to which AES gets influenced because of the advice they received from prominent key persons (peers) to use some social media platforms. Venkatesh *et al.* (2003) defined SI as “the degree to which an individual perceives that important others believe he or she should use the new system.” This determinant is the third and the last behavioral intention to adopt a technology. Venkatesh *et al.* (2003) emphasized that SI involves the notion of subjective norm, social factors and image. In this context, the subjective model covered SI for this research, which means an individual might use some social media platforms because of the thought of key persons who have a more excellent relationship with the business owner; this shows how peer referents are essential. Venkatesh *et al.* (2003) explained that SI has a more substantial impact on user behavior but in mandatory contexts. Narasimhamurthy (2014) conducted a study on the degree to which 450 young adults use social media sites in India and revealed that social media sites these days are highly prevalent, and these youngsters are actively playing a role. In other words, social media is a common and prominent platform that almost everyone is aware of and uses for personal or business activities. The focused group for this present study comprises more youths who are aware of most social media platforms and uses for their benefits before becoming entrepreneurs. Therefore, with the proposition that because of the high level of awareness and benefits on social media platforms, peer referents are likely to play a non-significant role in AES usage behavior of social media platforms.

Talukder *et al.* (2013) examined the impact between SI (peers) and owners of small-medium enterprises’ views on social networks adoption in Indonesia and detected a significant impact.

This evidence supports what Venkatesh *et al.* (2003) proposed in their study that SI determinants (e.g. peers) do influence an individual's actual use behavior of technology in their business.

Although a study proposed that SI will not influence the actual use of social media applications among owners of small business African Americans (Serben, 2014), the researcher did find SI positively impacts the African American entrepreneurs' usage behavior of social media.

However, the researcher did find SI positively impacts the African American entrepreneurs' usage behavior of social media. Mandal and McQueen (2012) applied a qualitative method for promoting the usage of a business Facebook page, small firms. They also proposed that SI influences owners' actual usage of social media platforms. They found that SI has a moderating impact on social media usage.

Social media facilitating conditions

Social media FC (SMFC) is the last determinant in this section, which is the extent to which AES has the necessary resources and knowledge to use social media platforms. In the unified model, FC is referred to as the "degree to which an individual believes that an organizational and technical infrastructure exists to support the use of the system" (Venkatesh *et al.*, 2003). And accordingly, FC functioning aspects cover external technological infrastructure and the company's resources designed to help eliminate problems regarding the use of a system (Venkatesh *et al.*, 2003). The authors suggested that FC will not affect user behavior significantly, but from the findings, FC influenced age and experience when moderated. And, as already stated, moderation will not be applied in this study. Therefore, the proposition here is that the availability of technological infrastructure and other resources with assistance from groups or technical platform agents will positively influence AES's actual use of social media platforms.

Previous studies suggested that FC positively influences use behavior. They confirmed FC is connected to the actual use of social media by small business owners and student entrepreneurs in both Malaysia and Morocco (Alexandra, and Kassim, 2013; Nawi *et al.*, 2016).

Technological opportunism

Marques *et al.* (2019) stated that entrepreneurs' startups formed commercial enterprises and proposed innovations layout and method. The characteristics and formation of new goods and services have entirely shifted as a result of digital innovation (Nambisan *et al.*, 2017). But outstandingly, "technological opportunism" is different from business innovative and technological awareness (Srinivasan *et al.*, 2002).

Technological opportunism (TO) is the disparities in acceptance of advanced technology between businesses that can link through a "sense-and-respond capability" of firms regarding the latest technologies (Srinivasan *et al.*, 2002). The TO conceptual model was extended on Wernerfelt's theory, 1984, "resource-based view of the firm" to examine the reason why individual businesses proactively use advanced technologies while others resist. The model findings suggested that the technological environment of a firm affects its technological opportunism by having a focus planned, business leaders supporting the usage of the latest technologies and lastly, exhibiting an adhocracy practice in the business. Not every company that senses the most recent technologies would respond as such "technologies can cannibalize existing products, markets, and organizational relationships and result in switching costs" (Chandy and Tellis, 1998).

Inputs from the TO model investigates the capability of AES technology-response capability is the firm readiness and the capacity to react to the latest technologies it recognizes in the market environment, which might influence the firm (Srinivasan *et al.*, 2002). Business is continually in an "enactment mode" concerning the latest technologies, searching as conceivable "opportunities or threats" technologies (Daft and Weick, 1984).

Based on these shreds of evidence, this research believes that technology-response capability will influence the use of social media platforms. Therefore, with the proposition that the technology-response capability is one of the significant constructs affecting AES in the actual usage of social media platforms, the higher technology-response capability of an academic entrepreneur, the greater a firm adopts and uses a platform.

Actual level of social media usage

On the view of the actual usage of social media applications, this study intends to find out the various level of an application used by AES (social media platforms) to market their business. Venkatesh *et al.* (2003) argued that it is most relevant to study the connection between business owner (user) acceptance and usage outcomes, because, most often, using any technology is believed to end up in the actual results.

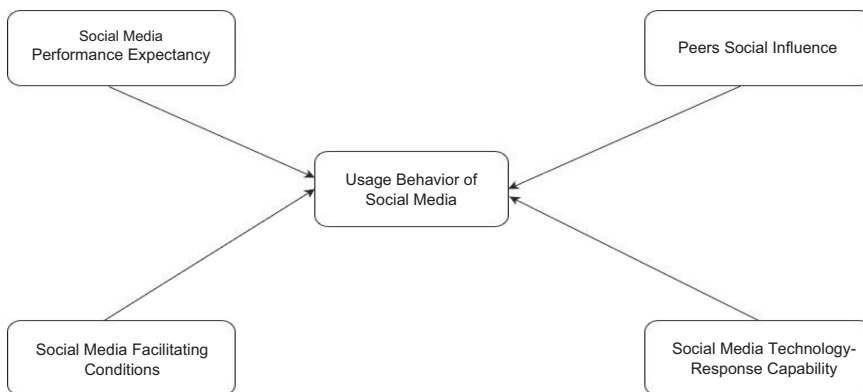
Talukder *et al.* (2013) studied 350 small-medium enterprises and discovered that Facebook is an innovative technology platform widely used in the operational activities of Indonesian businesses. Related research was also carried out by Nawi *et al.* (2017) in Malaysia among 300 student entrepreneurs, and the outcome proved that Facebook is the most common platform used, followed by Twitter and Tumblr. Therefore, the proposition that the most adopted and used social media application or platform will positively affect AES business marketing activities.

Conceptual research model

Based on the intention of this research, literature review, research theory, a conceptual research model was proposed. Figure 1 gives an overview of the phase development process. The first frame of the conceptual idea centers on social media performance expectancy; secondly, peers social influence, then SMFC, social media TO and social media use behavior. All the determinants applied in this research play a crucial role and also have a direct influence on the use of any social media platforms or a system. This model is to help explain how valuable social media platforms are to AES in India, and when enthusiastic, they are to utilize in the interests of TO. It also investigates the actual use of social media platforms and attempts to understand the contribution of AES, irrespective of various hurdles they face.

Methodology

The present study is divided into two phases to gain valuable insights into the challenges faced by AES while using social media technologies in their entrepreneurial initiatives. The first phase includes an exploratory study comprising of semi-structured interviews for

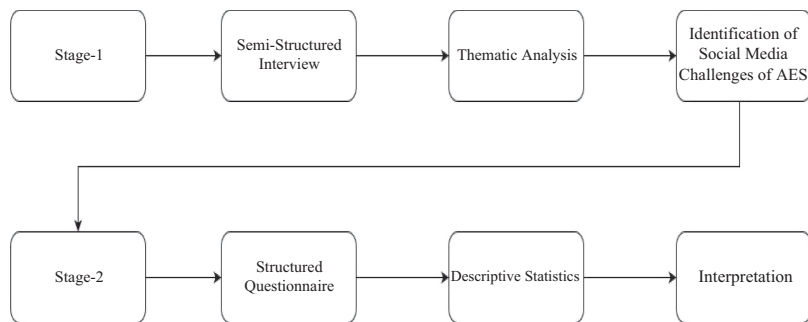


Source(s): Authors' compilation

Figure 1.
Proposed model of
usage behavior of
social media for AES

identifying social media challenges faced by the AES. On the other hand, the second phase encompasses designing questionnaires for the social media challenges identified in Phase 1. Questionnaires are developed based on available literature for the social media challenges for the entrepreneurs. The reason for dividing into two stages is that there is hardly any literature available for the social media challenges for the AES. Literature availability restricts itself to general entrepreneurs. Social media challenges faced by the AES may or may not have some relationship with general entrepreneurs. The current study took in-depth interviews to identify social media challenges faced by the AES. Further, it investigated literature for the identified social media challenges to ascertain the differences between AES and general entrepreneurs.

Flowchart of methodology



Stage 1. Stage 1 included the adoption of an exploratory research method that is qualitative and comprises semi-structured interviews with experienced academic entrepreneurs. The primary reason for adopting a qualitative interview was to provide a new understanding of the social occurrence, which enables participants to reflect and think differently on a variety of topics (Folkestad, 2008). Moreover, research in this particular area is still in the nascent stage. Hence, the qualitative-exploratory method assists researchers in discovering relevant factors considered in a study (Stebbins, 2001).

Research design and sampling. The in-depth interview intends to identify various challenges the AES are facing in the present scenario relating to the adoption and usage of social media technology. The in-depth interviews conducted in this study provided rich and detailed information on the experiences and perceptions of AES related to the identification of social media challenges. These interviews enable the researchers to consider the meanings that the respondents attributed to the aspects that led them to identify social media challenges for academic entrepreneurship. For the in-depth interview, the study selected six AES respondents (three males and three females) chosen with a consideration that they should have at least six years of experience. It must have implemented social media technologies to promote their ideas or business right from the preliminary phase. The objective of questioning these persons was to identify and determine factors that play the role of social media challenges for AES and also to assess how relevant social media challenges are to AES owners.

Data collection. To conduct the interview, a set of predefined questions (Appendix 2) was framed to address the issues relating to social media challenges. The study made sure that the interviews followed a structure to provide a comparison of data obtained from various respondents. Although each interview used the predefined questions to direct the interview

process, there was enough scope for inclusion of relevant issues addressing the problem. It took about 30 min to complete the interview. All interviews were audio-recorded and transcribed and analyzed using thematic analysis with the written consent of the participants.

Generally, thematic analysis is accepted universally as the qualitative approach to the study of interviews. For the present interview, the theoretical position of [Braun and Clarke \(2006\)](#) was the primary basis for a conceptual framework for the thematic analysis. According to [Braun and Clarke \(2006\)](#), the thematic analysis is a tool commonly used for “identifying, analyzing, and reporting patterns (themes) within the data.” The purpose of taking this analytical tool was that “rigorous thematic approach can produce an insightful analysis that answers particular research questions” ([Braun and Clarke, 2006](#)).

The data collected in the interviews were examined using thematic analysis, based on [Braun and Clarke’s \(2006\)](#) six-step approach:

- (1) familiarizing with the transcripts by listening to the recordings repeatedly;
- (2) to generate initial codes by identifying the main features in the data that appear exciting and meaningful;
- (3) searching for patterns or themes from the collated codes across the different interviews;
- (4) themes were reviewed by ensuring that data within themes cohere together meaningfully, and at the same time, clear and identifiable distinctions between themes were ensured;
- (5) refining and defining themes and potential subthemes within the data were ensured. After that, theme names and clear working definitions were given, which captured the essence of each theme in a concise and punchy manner; and
- (6) offering results and discussions.

The results and discussions of the interview are presented below. The interview started with preliminary questions that acted as an ice-breaker and produced a useful connection between interviewer and interviewee. These questions included personal and professional information about the respondents and their views on academic entrepreneurship.

Then, we asked them about their motivation for becoming an academic entrepreneur. Four respondents (A, B, D and F) replied that they were motivated by the classroom teaching, especially the case studies of young and successful entrepreneurs, e.g. Ritesh Agarwal, founder of Oyo Rooms. While respondents C and E said that becoming academic entrepreneurs gives them the freedom to work on their ideas. [Table 1](#) shows the findings describing the six respondents’ business areas.

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Respondent code	Area of business	Sector/industry
A	Renting of books	Service
B	Shuttle mobile application	Service
C	Clothing	Retail
D	Retailing products on discount cards	Retail
E	Mushroom farming	Manufacturing
F	Biogas bottling	Manufacturing

Table 1.
Research respondents

The rest of the two respondents said that becoming academic entrepreneurs gives them the freedom to work on their ideas.

Then we asked them the reasons for choosing social media over other traditional media. Almost all replied that social media is a convenient means of reaching out to the target customers.

Further, they also acknowledged that the usage of social media in their businesses has been advantageous to some extent. According to the experts, most used social media platforms for promoting businesses are Facebook, Instagram and WhatsApp, but solely relying on social media platforms is not sufficient because, in many cases, social media does not reach the target customers. After this, the experts were directly asked questions concerning the issues relating to social media challenges faced by the AES. All six respondents shared their views on the concerns on social media challenges faced in their day-to-day businesses in their ways. From the thematic analysis, important themes were extracted from the transcripts and were refined and defined, and theme names were given. A total of nine themes were obtained, namely, managerial challenges, lack of access, business-to-customer challenges, brand and reputation challenges. Privacy and security challenges, competition, technological infrastructure, policy, legal and regulation challenges and cultural and language challenges.

Stage 2. Stage 2 included the development of a structured questionnaire based on social media challenges identified in Stage 1. The items for social media challenges were adopted from comprehensive or extant literature (Straub *et al.*, 2004). Based on our knowledge, there were no actual items on AES using digital technologies platforms like social media. Therefore, by referring to the pertinent literature on social media challenges of business owners, the present study developed the original questions. The questionnaire developed was assigned to the entrepreneurship experts to examine the items and then was revised according to their suggestions (Appendix 3).

Additionally, the structured questionnaire also included items that are influencing the social media usage behavior of AES. Based on the UTAUT and TO model, four factors (PE, peer influence, FC and TO) influence social media usage behavior. As the items were directly adopted from the renowned model like UTAUT and TO, no changes were made in the questionnaires, as the constructs were understandable and clear.

The present study classified items of the questionnaire on the five-point Likert scale, ranging from “strongly disagree” to “strongly agree.” The questionnaire included various parameters to measure the social media challenges the Indian AES undergo in the initial phase of their businesses. The social media challenges included issues like managerial problems, internet access, privacy and security problems, legal issues, cultural and language problems, growing competition, technological infrastructure and so on. The structured questionnaire also enquired about the intentions of AES to adopt the latest technology to promote their businesses and also explored the technological opportunities in the present scenario.

Research participants. In this present study, purposive sampling was applied, in which a total of 23 respondents being AES participated in the research. This sampling technique involves ascertaining a suitable selection criterion and sought relevant participants who fit this criterion (Palinkas *et al.*, 2015). For sample selection, few criteria were set. First, participants needed to be the founder/co-founder of any start-ups. Then, the participants needed to be students or alumni from a technical academic institution, namely, IIT (ISM) Dhanbad. Lastly, they should be managing personal businesses through the identification of an opportunity during their course of study and making a profit. The fact is that once AES were selected, it implies that they are or once a student in the academic institution. And had triumphantly recognized opportunities where they are running businesses inside the institution campus, Center for Innovation, Incubation and Entrepreneurship (CIIE) and its environment and hence shared their business encounters in this concern.

A total of 23 respondents took part in the current research. The strength point of taking 23 respondents was that they are well qualified for this study. As very few academic institutions promote academic entrepreneurship in India with the help of government support, AES' respondents are very rare to find. Hence, these 23 AES respondents are adequate to represent the AES, as they are the real custodians of the information the current research is examining.

Data analysis. For the data analysis, SPSS version 21.0 for descriptive studies was used. This study is purely exploratory and hence performed on a small size. In exploratory research, the descriptive statistics are pivotal as they provide insights about the research problems and simultaneously lay a foundation for further investigation. Software such as SPSS offers a complete range of information about the data characteristics, which is tedious to generate if performed manually. The complete range of information is necessitated at this juncture, as errors, particularly the sampling error, can be discerned beforehand, and preemptive control is exercised in the subsequent studies.

Braun and Clarke (2006) demonstrated that thematic analysis provides an “accessible and theoretically flexible” means to interpret data qualitatively. The third thematic step highlighted that, first, some codes are formed, but also, this particular step could re-concentrates on a “broader level of themes rather than codes.” Therefore, we have focused on making general analyses concerning our theme to examine the usage behavioral and responding capability of AES using technological platforms (social media).

Three out of the 23 respondents were women. Their ages were between 21 and 35, where the average age of the respondents was 29 years. Most of the entrepreneurs had completed their post-graduation studies, followed by undergraduates. Almost all the respondents were unmarried, and their startups were in the beginning phase ranging from 1–6 years. More than half said to have a monthly income between INR11,000 and INR20,000. The service sector was preferred as the most viable for the startup business in the present study, followed by the manufacturing industry, the retail industry and wholesale.

The research also enquired about the usage of social media for promoting and communicating their products and services to their target audiences. Here, almost all the respondents chose Facebook as a medium for promoting their businesses, followed by Instagram, WhatsApp, Twitter, business websites, LinkedIn.

Findings and discussion

The main intention of this study is to explore the significant opportunities/challenges of the use of digital technologies in AES firms. The results prove the factors accelerating the usage of digital technologies in the recent transformation of a firm's activities and society worldwide. The RQ discussed in this paper is:

RQ1. What are the significant issues related to social media technologies faced by AES?

The present study enquired about the challenges faced by the Indian AES while implementing social media into their business for the promotion of their products or services. These various parameters were identified through extensive literature review for measuring social media challenges the Indian entrepreneurs undergo in the initial phase of their businesses. The social media challenges included issues like managerial problems, internet access, business-to-customer challenges, brand reputation challenges, privacy and security problems, legal issues, cultural and language issues, growing competition and technological infrastructure. The findings for each social media challenges have been presented below.

Managerial challenges

Under this, a total of eight questions were asked regarding managerial issues in a firm using social media platforms. For example, MC2: “Difficult to measure the impact and effectiveness of

using social media,” in this statement, 52.2% respondents have disagreed and 13% them strongly disagreed with this statement. The findings imply that the majority of the respondents perceive social media usage advantageous in terms of measuring its impact and effectiveness in their businesses. MC3: “Difficult to maintain effective communication with my customer on social media,” in this statement, 43.5% of the people disagreed and 17.4% of them strongly disagreed. This decision implies that people do not see any challenges in maintaining effective communication with their target audience using various social media platforms. MC6: “Lack of managerial ideas and strategies to handle social media issues,” in this statement, 73.9% of people disagreed. Asserting that managerial ideas and strategies to handle social media issues is no more a challenge because they are very good at using social media.

Lack of access

A total of six questions were asked regarding the lack of access to the internet and other technological accesses. LA1: “Lack of internet access,” in this statement, more than 70% of the respondents said internet access is not a challenge for them, with 34.8% disagreeing and 30.4% strongly disagreeing. LA2: “Lack of access to marketing information online,” in this statement, more than 70% of the respondents said access to marketing information is not an issue for them, with 47.8% disagreeing and 21.7% strongly disagreeing. LA4: “Lack of personal experience accessing social media,” in this statement, more than 70% of the respondents (i.e. 52.2% disagreed and 21.7% strongly disagreed) said they are good at handling social media. Hence, they did not consider it a challenge.

On the other hand, more than 60% of the respondents agreed for the statement LA5: “Lack of access to my business platform offline (e.g. Google Maps),” with 34.8% accepting and 26.1% strongly agreeing. This result means that despite having excellent internet access, computers and other accessories; access to marketing information; and experience of using social media, the Indian entrepreneurs still lag in positioning themselves offline through which customers could reach them. Furthermore, monitoring their pages to respond to their customer’s queries/orders on time when they are offline is another challenge. Hence, more attention should be given to have offline access to their businesses.

Business-to-customer challenges

Under this, a total of seven questions were asked regarding business-to-customer-related issues. From the findings, one thing can be observed that in the matters relating to business-to-customer, most of the respondents preferred to be neutral. For example, BCC1: “Less number of customer reach,” BCC3: “Lack of transparency between my business and customers through a blog or other online forum,” BCC4: “Due to some customers resistance towards social media sites,” BCC7: “Due to less participation in discussions with my customers on my social media sites.” The proper reasons for being neutral may be that they are not sure how much they have customer reach and engagement and are transparent to their target audiences through various channels. For the statement BCC5: “Lack of understanding of my customers’ needs and preferences,” the respondents disagreed (65.2%). They strongly disagreed (8.7%), indicating that they have an excellent understanding of their customers’ needs and preferences.

On the other hand, in the statements like BCC2: “Lack of trust” (business-to-business and business-to-customers). And, BCC6: “Lack of face-to-face interaction with my customers,” the respondents have agreed to say that it is a challenge for them to create trust among each other and have face-to-face interactions with their customers. Hence, they should focus more on these two points.

Brand and reputation challenges

Under this, a total of six questions were asked relating to issues in creating and maintaining brand image and its reputations. BRC1: “Due to negative comments and complaints on my

social media pages by customer and others,” and BRC2: “Lack of trained staff to handle negative comments” for these statements, 50% of the respondents agreed that the negative comments affect their brand image. Also, they acknowledged that they have failed to handle those negative comments. On the other hand, the other 50% of respondents did not consider these issues as a problem. But overall, BRC1 and BRC2 should be paid more attention to handle negative comments and increase positivity in the customers. Further, BRC3: “Due to inadequate content of information shared on my business sites,” in this 30.4 and 13.0% of respondents agreed and strongly agreed, respectively, that inadequate information shared on business websites affect their brand image and reputation.

Privacy and security challenges

The basic “concept of privacy”: PSC1, the “refusal that comments posted on my social media pages do not represent my business”: PSC2, “breaches of customers’ confidentiality”: PSC3 and “violations of my business guidelines or codes of conduct”: PSC4 were all cited as disagreed and undetermined statements by the majority of the respondents. On the contrary, AES is aware of the social media platform’s privacy and security threats and the probability that most of them are enthusiastic, thereby exerting steps to reduce some of the risks that have produced such results in this study.

Competition issues

Under this, a total of two questions were asked relating to matters the Indian AES encounter in the competitive market. For instance, CI1: “Due to severe competition, both local and international,” for this statement, 39.1% of the respondents agreed and 17.4% strongly agreed. This outcome signifies that the competition at domestic as well as international level is very high, and it is a great challenge for them to overcome it. CI2: “Competitor take advantage over my business marketing information shared on social media platforms,” for this statement 39.1% of respondents agreed and 26.1% strongly agreed that the competitors take advantage of the information furnished on their websites. Hence, entrepreneurs must take care of the issue seriously as to what content to be published on their webpages because hiding information may also lead to mistrust and transparency issues among customers, which may be detrimental for business organizations.

Technological infrastructure

Under this, a total of three questions were asked relating to issues of technological infrastructure Indian AES encounter using social media platforms. TI1: “Lack of interoperability between my business social media sites,” for this statement, 52.2% of the respondents disagreed, stating that operating various social media sites is not an issue in managing. TI2: “Less e-payment infrastructure,” for this statement, there are mixed responses. However, setting up the e-payment infrastructure should be considered a significant challenge in the present scenario. TI3: “Lack of proper infrastructure structure,” for this statement also, there is a mixed response, but overall setting up proper technological infrastructure structure is indispensable in the age of Internet and social media.

Policy, legal and regulation challenges

Under this, a total of five questions were asked concerning policy, legal and regulation issues. PLRC1: “Lack of information protection” and PLRC3: “High rate of cybercrimes,” in these two statements, majority of the respondents have agreed that there should be an active policy that would protect their information and from other cybercrimes. Hence, eradication of cybercrimes and information protection is an unprecedented challenge for academic

entrepreneurs. On the other hand, for statements like PLRC2: "Lack of social media marketing policies" and PLRC4: "Lack of regulation on virtual images on social media," the majority of the respondents remained neutral. As the operationalization of their business is not affected by social media marketing policies, they prefer to be neutral in this regard.

Cultural and language challenges

Under this, a total of two questions were asked relating to the issues the Indian AES deal with using social media platforms. CLC1: "Lack of local dialect use on my business social media sites," in this statement 60.9% of the respondents remained neutral in this regard, whereas 17.4 and 8.7% agreed and strongly agreed, respectively, to declare that local dialect affects their business in various social media platforms. From here, it is clear that the use of local dialect does not pose a significant challenge in the smooth running of a business. Similarly, in the statement CLC2: "Due to pre-existing organizational cultures and hierarchies," 39.1% of the respondents said to be neutral and 34.8% said to disagree. These reasons intend in a social media context that the culture and language have very minimal impact on the day-to-day operation of the business.

The findings to the RQ1 have been found mostly contrary to the past studies in the literature review. Like managerial, brand and reputation, privacy and security, policy, legal, and regulation issues. On the other hand, this study found that AES lag linking offline and online of their business digital platforms. This result supports the research findings by [Boyd and Ellison \(2007\)](#) and [Durkin et al. \(2013\)](#) that entrepreneurs encounter such issues. Also, face-to-face interaction with customers and trust issues are found to be in line with the findings of [Abdul and Mwasimba \(2017\)](#) and [Cawsey and Rowley \(2016\)](#). Competition has also been concluded as a severe issue to AES, and it is in support of prior studies. Lastly, technological infrastructure and cultural and language issues were in mixed responses, which are somewhat in agreement with the past findings in this study.

Performance expectancy

Respondents were asked about PE-related questions using social media. For example, we asked the respondents about the usefulness of social media in their businesses; 43.5 and 39.1% of the respondents agreed and strongly agreed, respectively, to state that the adoption of social media is essential for running their business. Further, more than 80% of the respondents, i.e. 47.8% approved, and 39.1% strongly agreed, said that the inclusion of social media into their business would increase their productivity. Similarly, more than 80% of the respondents positively noted that social media usage into their business helps in accomplishing their business tasks more quickly and with minimal efforts. Hence, social media PE is very high among the AES.

Peer social influence

Respondents were asked about how peers and related businesses affect their social media usage behavior. For example, PSI1: "People who influence my business think that I should use social media technologies" and PSI2: "People who are important to me think that I should use social media technologies." In both the cases, i.e. PSI1 and PSI2, more than 70% of the respondents said that their social media usage for business purposes is influenced by the peers who are vital for them and their businesses.

Facilitating conditions

Respondents were asked about the resources and the knowledge or expertise necessary for using social media technology. For example, FC1: "I have the resources to use social media technologies" and FC2: "I have the knowledge necessary to use social media technologies." In both cases, i.e. FC1 and FC2, more than 80% of the respondents said that they have the necessary resources relating to social media technology and the knowledge or expertise to use it.

Usage behavior

Respondents were asked about their usage of social media applications in their businesses. For example, UB2: "I use social media applications regularly in my business" and UB3: "Most of my marketing is done through social media applications." In both cases, i.e. UB2 and UB3, more than 70% of the respondents said that the social media applications are being used regularly for running their business and for marketing their goods and services to a large audience.

Technology-response capabilities

Respondents were asked about their technology-response capabilities, which means that how quickly they respond to any changes in social media technology and their application. The findings suggest mixed responses in technology-response capabilities. TR1: "I generally respond very quickly to social media technological changes in the environment," in this statement, 47.8% of the respondents remained neutral, whereas only 43.5 and 8.7% of respondents are found to respond to social media technological changes in the environment. TR2: "My business unit lags behind the industry in responding to new social media technologies" for this statement 39.1% disagreed and 8.7% strongly disagreed, saying that they do not lag behind the industry in responding to new social media technologies. But, many respondents, i.e. 30.4%, remained neutral to this statement, which implies that they are still reluctant to update themselves with the latest technologies.

Similarly, for the statement TR3: "For one reason or another, I am slow to respond to new social media technologies," 34.8% of the respondents disagreed. And, 8.7% strongly disagreed, saying that they do not have problems in adopting the latest social media technologies in their businesses. However, 34.8% of the respondents remained neutral to this statement, which means that either they have some issues for being slow to respond to social media technologies or they do not want to reveal themselves. But, it is visible that academic entrepreneurs are facing challenges like the high cost of business operations, managerial issues, and this leads to their slow response toward digital technologies.

This research contributes and supports the UTAUT and TO model that provides empirical strength to our extended model. It is revealed that AES' intention to use digital media is undoubtedly influenced by the advice and suggestions of essential peers. An example, as stated by one respondent, "I am extremely connected to my seniors who are successfully running their business, so they guide and advise me to use LinkedIn and Instagram, which I did."

The present study on AES will have a slight impact on the sector and industries the respondents operate in because they are in the initial phase of their startups. As they are at the base level of their businesses, the sector or industries will hardly be affected. And, it is difficult to affirm that these AES' owners will persist with the sectors/industries they are operating currently, as the institution is providing them training, funds and the infrastructure to run their startups within the campus. This statement did not mean every challenge the institution is resolving for AES; however, they are supported. The results of this study can be taken as a suggestion from emerging startups' owners with a technology background. AES from a technological institution engage more and are useful in doing business with their stakeholders by the usage of digital technologies (social media platforms). AES are shaping their institution and country for establishing their businesses through knowledge gaining.

Conclusion and implications

Overall synthesis about the research aim and findings

This research intends to understand the factors that influence the operation of AES from social media technologies opportunities and challenges and the Unified and TO model. Based

on the findings attained, the primary factors to AES social media technology challenges are competition, face -to-face interaction with customers and trust issues. Other problems explored in this study that are partially in line with previous findings are technological infrastructure and cultural and language issues. However, AES exerts every opportunity social media technologies providing to them, having access to the internet and other technologies are benefiting them to connect to their customers and others. Moreover, they equip themselves to handle social media issues because they have orchestrated their lectures and work experience to make sustainable incomes.

These shreds of evidence give remarkable insights into the business perspective of AES using digital technologies, making their businesses operational. The outcome would encourage and lead activities, particularly emerging startups adopting specific digital technology platforms for promoting their businesses. Universities progressively expanded their fields of activity. And, the digital technologies aspect, universities are using to equip students and researchers with knowledge, providing incubator centers and funds to establish startups and spinoffs within their campuses. Hence, entrepreneurial universities are the central actors to communities and national development through knowledge sharing. Additionally, entrepreneurial universities have a strong influence on students' and researchers' attitudes and decisions toward digital technologies entrepreneurship. The prominent factors identified from digital technologies usage give a more precise understanding of AES and help them develop better strategies for the competitive market.

It is recognized in the semi-structured questionnaire that AES benefited from the potentials of digital technologies despite its challenges. Social media technologies have given these AES many opportunities, such as using social media technologies, as the most advanced and effective platforms to reach customers all over the world, especially WhatsApp and Facebook. They know the complaints and suggestions of their customers. Most of AES owners have been able to connect to their customers through an ideal social media platform. The preferences of customers are well known through digital technologies. Improving their products and services and how people are aware of their business helps them to understand how much they have to contribute to their entrepreneurship journey.

This research focused on AES, and therefore, a qualitative approach was undoubtedly the best choice as close-up data were required. This methodology was successful in presenting a rich and detailed image of the individual respondents surveyed. Though the body of the literature focused on the entrepreneurs' challenges and opportunities using social media technologies, focusing on ground-level AES offers a more holistic context for potential opportunities and obstacles for startups. Considering how these researches can support such startups and progress from one development stage to the next.

India's government is creating fests for showcasing innovation startups and providing an ecosystem for startup collaboration platforms in India. The government plans to set up national and international startup festivals, provide a single point of contact for the whole startup community and allow for the sharing of information and access to funding. Funding for AES would help to promote startups among students more than usual entrepreneurs who are already in the real competitive markets. For other prospective, AES may do more mentoring.

Implications for theory

Many theoretical interpretations provided from the study findings underline the theoretical background. The study has given useful implications for academic startups, other entrepreneurs and the institutions promoting academic digital entrepreneurship. Also, the

study explains the potential digital technologies media platforms and has been accepted among evolving startup entrepreneurs. The study identified that business-to-customer relations, brand, reputation, competition and cultural and language influence digital technologies entrepreneurship. While the findings discovered that the extended research model has a positive impact on academic entrepreneurs' intentions to use digital technologies media platforms. The outcome of this paper has thrown more light on which issues are there in digital technologies entrepreneurship, the determinants and actual usage advantages from the UTAUT and TO models that could be appropriately employed. To solve issues of digital technologies, AES and entrepreneurs should look after the opportunities of the technological platforms and blend their knowledge and facilities to adopt and use digital technologies.

Implications for practice

This work has policy and practice implications factors in terms of access to financial capital, infrastructure and strategies to build more effective and inclusive social media technologies. Policies support the productivity of local systems and personal businesses, indicating that the creation of similar technologies may simultaneously contribute to the different operation types of individual startups and the technology ecosystem.

Promoting AES activities using social media technologies as market platforms, schemes or programs and policies for startups should focus on enhancing cybersecurity, brand image and reputation and added-value services. It is also essential for policymakers and government initiative agents to give immense consideration to developing academic entrepreneur startups to reduce privacy and security issues, copying of website business information and secure technological e-payment infrastructures. For development in AES, however, Indian policies must ruminate the subject of digital platforms online and offline connection as a severe issue that requires special attention. Also, the Government of India should create a culture of academic entrepreneurship among students and institutions, rather than endorsing more of job placements for students.

Ultimately, the findings of our research might be practical because funds are vital to AES, and policies could be aimed at ways to enable these emerging startups to receive funding to create startups and sustain their activities. Local business aid agencies could also assist in expanding AES' social networks with various corporate organizations and entrepreneurs and creating unique frameworks to consider AES' owners' requirements. Also, for knowing how the real market operates, advice from corporate organizations and successful startup entrepreneurs could help them because they intend to move to the actual market to grow their businesses.

Limitations of the study and future research

This research is limited in the collection of samples. The study covered only one Indian AES institutions, which limits the generalization of findings. This study offered a better idea of the actual problems and advantages of social media technologies. The results will encourage and guide academic entrepreneurs to use social media technologies for startup activities. Therefore, policies and programs are required to enhance the use of digital technologies among entrepreneurs in India. The research can further be explored in different institutions, quantitatively, to reach certain conclusions with more satisfying reliability toward generalization.

More investigation on bigger AES' sets would be beneficial, especially taking a quantitative approach to monitoring their impacts on the economy, activities and changes over time. The respondents' diversity sector and industries also had some implications for the interpretation of results. The impact of this paper could not be viewed as the main challenge of entrepreneurs' social media technologies, but rather as AES' challenges in a specific community and institution. Given such limitations, this paper aims to provide a starting point

for further study and discussion on AES' significant challenges and opportunities utilizing social media technologies as the leading promotional platforms.

Note

1. CIEE is a non-profit center at the Indian Institute of Technology Dhanbad, devoted to promoting innovation and entrepreneurship: <https://www.itism.ac.in/pdfs/ciee/ciee.pdf>.

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Factor/Challenge	Reference	Details
<i>Internal challenges</i>		
Managerial	Abdul and Mwasimba (2017), Boyd and Ellison (2007), Brenkert (2002), Brooks <i>et al.</i> (2014), Culnan <i>et al.</i> (2010), Durkin <i>et al.</i> (2013), Hayter <i>et al.</i> (2017), Laukkanen (2003), Leeflang <i>et al.</i> (2014), Martin and van Bavel (2013), Meske and Stieglitz (2013), Sabraz Nawaz and Mubarak (2015)	Social media distraction, measuring social media effectiveness and maintaining efficient communication, less awareness, technical staff, less experience, ideas and strategies, time, skills, tools
Lack of access	Boyd and Ellison (2007), Brooks <i>et al.</i> (2014), Cawsey and Rowley (2016), Durkin <i>et al.</i> (2013), Khajeheian (2013), Martin and van Bavel (2013), Nakara <i>et al.</i> (2012)	Internet access, marketing information, resource, offline access, network structure
Business-to-customer Relation	Abdul and Mwasimba (2017), Brenkert (2002), Brooks <i>et al.</i> (2014), Cawsey and Rowley (2016), Harris and Rae (2009), Hayter <i>et al.</i> (2017), Leeflang <i>et al.</i> (2014), Sabraz Nawaz and Mubarak (2015)	Customer reaching, trust, transparency, customer resistance, face-to-face interaction, understand customers, discussion participation
Brand and reputation	Brooks <i>et al.</i> (2014), Cawsey and Rowley (2016), Culnan <i>et al.</i> (2010), Durkin <i>et al.</i> (2013), Harris and Rae (2009), Kaplan and Haenlein (2010), Sabraz Nawaz and Mubarak (2015), Rao and Kothari (2017)	Negative comments and complaints, trained staffs, the content of information, coordination and direction, tone of voice, control, and power
Privacy and security	Boyd and Ellison (2007), Brenkert (2002), Culnan <i>et al.</i> (2010), Durkin <i>et al.</i> (2013), Harris and Rae (2009), Hayter <i>et al.</i> (2017), Kaplan and Haenlein (2010), Martin and van Bavel (2013)	Privacy, information ownership, breaches, intellectual properties, codes of conduct
<i>External challenges</i>		
Competition	Brooks <i>et al.</i> (2014), Khajeheian (2013), Martin and van Bavel (2013)	Severe competition – local and global, advantages over social media
Technological infrastructure	Abdul and Mwasimba (2017) Khajeheian (2013), Leeflang <i>et al.</i> (2014), Martin and van Bavel (2013)	E-payment, interoperability, structure
Policies, legal and regulation	Abdul and Mwasimba (2017), Culnan <i>et al.</i> (2010), Durkin <i>et al.</i> (2013), Harris and Rae (2009), Kaplan and Haenlein (2010), Khajeheian (2013), Laukkanen (2003), Martin and van Bavel (2013), Meske and Stieglitz (2013), Sabraz Nawaz and Mubarak (2015), Tsitsi Chikandiwa <i>et al.</i> (2013)	Information protection, marketing policies, cybercrime, virtual images, customer protection
Culture and language	Martin and van Bavel (2013), Meske and Stieglitz (2013), Tsitsi Chikandiwa <i>et al.</i> (2013)	Culture and hierarchies and local dialect

Table A1.
Challenges of social media platforms

Appendix 2
Interviewed questions

- (1) Can you tell me more about yourself and background (e.g. business sector, experience and educational background)?
- (2) What are your views on academic entrepreneurship?
- (3) What contributed to you becoming an academic entrepreneur?
- (4) At what point did you adopt social media in your business?
- (5) Why did you choose social media over other platforms?
- (6) Which of the social media site(s) do you mostly use, and how effective has it been?
- (7) Did you feel threatened by your competitors that you decided to act using social media? If yes, how?
- (8) What are the various challenges you have faced using social media?
- (9) What role has social media plays in your business so far?

Appendix 3

Challenges	Codes	Question description	References
Managerial challenges	MC1	Due to other distractions of using social media technologies, myself and employees encounter time management challenges	Literature
	MC2	Difficult to measure the impact and the effectiveness of using social media platforms	
	MC3	Difficult to maintain effective communication with my customer on social media platforms	
	MC4	Lack of customers' awareness of my business social media platforms	
	MC5	Lack of technical staff or my IT personnel(s) are less experienced/skilled	
	MC6	Lack of managerial approaches and strategies to handle issues my business faces on social media platforms	
	MC7	Marketing my products or services on social media platforms is time-consuming	
	MC8	The high cost of investment of funds and devices operating on social media platforms	
Lack of a	LA1	Lack of internet access	Literature
	LA2	Lack of access to marketing information online	
	LA3	My business lack technological devices to be active on social media platforms (e.g. computer, accessories)	
	LA4	Lack of personal experience accessing social media platforms	
	LA5	Lack of access to my business platforms offline	
	LA6	Lack of network structure	

Table A2.
Questionnaire of social
media challenges
(continued)

Challenges	Codes	Question description	References
Business-to-customer Challenges	BCC1	Less number of customers reaching	Literature
	BCC2	Lack of trust (business-to-business and business-to-customers)	
	BCC3	Lack of transparency between my business and customers through a blog or other online forum	
	BCC4	Due to some customers resistance toward social media sites	
	BCC5	Lack of understanding of my customers' needs and preferences	
	BCC6	Lack of face-to-face interaction with my customers	
	BCC7	Due to less participation in discussions with my customers on my social media platforms	
Brand and reputation Challenges	BRC1	Due to negative comments and complaints on my social media pages by customers and others	Literature
	BRC2	Lack of trained staff to handle negative comments	
	BRC3	Due to the inadequate content of information shared on my business sites	
	BRC4	Lack of coordination and direction between social media sites agents and my business units	
	BRC5	Difficulty achieving consistency of message and tone of voice while being sensitive to different functions (e.g. customer support) and audiences	
	BRC6	Difficult to give away power and control over my social media platforms while at the same time, avoiding embarrassment to the business	
Privacy and security Challenges	PSC1	Difficult conceptions of privacy	Literature
	PSC2	Due to the refusal of customers that comments posted on my social media pages do not represent the opinions of my business	
	PSC3	Due to breaches of customers' confidentiality	
	PSC4	Due to breaches of customers' confidentiality	
Competition issues	CI1	Due to severe competition both local and international	Literature
	CI2	Competitors take advantage of my business marketing information shared on social media platforms	
Technological Infrastructure	TI1	Lack of interoperability between my business social media sites	Literature
	TI2	Less e-payment infrastructure	
	TI3	Lack of proper infrastructure structure	
Policy, legal and regulation challenges	PLRC1	Lack of information protection	Literature
	PLRC2	Lack of social media marketing policies	
	PLRC3	A high rate of cybercrimes	
	PLRC4	Lack of regulation on virtual images on social media platforms	
	PLRC5	Lack of policy to protect customers using social media	
Cultural and language challenges	CLC1	Lack of local dialect use on my business social media sites	Literature
	CLC2	Due to pre-existing organizational cultures and hierarchies	

Table A2.

(continued)

Challenges	Codes	Question description	References
Social media PE	SMPE1	I find social media very useful in my business	Venkatesh <i>et al.</i> (2003)
Peer SI	SMPE2	Using social media in my business increase my productivity	Venkatesh <i>et al.</i> (2003)
SMFC	SMPE3	Using social media enables me to accomplish my business tasks more quickly	Venkatesh <i>et al.</i> (2003)
Social media use behavior	PSI1	Using social media make it easier to do my business	Venkatesh <i>et al.</i> (2003)
Social media technology-response capability	PSI2	Using social media make it easier to do my business	Venkatesh <i>et al.</i> (2003)
	SMFC1	People who influence my behavior think that I should use social media technologies	Venkatesh <i>et al.</i> (2003)
	SMFC2	People who are important to me think that I should use social media technologies	Srinivasan <i>et al.</i> (2002)
	SMUB1	I have the resources to use social media technologies	
	SMUB2	I have the resources to use social media technologies	
	SMTR1	I have the knowledge necessary to use social media technologies	
	SMTR2	I frequently use social media applications in my business	
	SMTR3	I use social media applications regularly	
	SMTR4	I generally respond very quickly to social media technological changes in the environment	
		My business unit lags behind the industry in responding to new social media technologies	
		For one reason or another, I am slow to respond to new social media technologies	
		I tend to resist new social media technologies that cause my current investments to lose value	

Table A2.

Appendix 4

Codes	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
MC1	17.4	26.1	30.4	21.7	4.3	100
MC2	13	52.2	13	17.4	4.3	100
MC3	17.4	43.5	13.0	26.1	0	100.0
MC4	0	30.4	30.4	30.4	8.7	100.0
MC5	13.0	34.8	17.4	30.4	4.3	100.0
MC6	0	73.9	17.4	8.7	0	100.0
MC7	8.7	21.7	34.8	21.7	13.0	100.0
MC8	0	30.4	8.7	39.1	21.7	100.0
LA1	30.4	34.8	0	8.7	26.1	100
LA2	21.7	47.8	17.4	8.7	4.3	100
LA3	4.3	43.5	13.0	26.1	13.0	100.0
LA4	21.7	52.2	13.0	8.7	4.3	100.0
LA5	13.0	21.7	4.3	34.8	26.1	100.0
LA6	17.4	39.1	17.4	26.1	0	100.0
BCC1	4.3	30.4	39.1	21.7	4.3	100
BCC2	4.3	17.4	34.8	43.5	0	100
BCC3	0	43.5	47.8	8.7	0	100.0
BCC4	0	17.4	43.5	34.8	4.3	100.0
BCC5	8.7	65.2	8.7	17.4	0	100.0
BCC6	4.3	17.4	26.1	52.2	0	100.0

Table A3. Results of social media challenges for AES (continued)

Codes	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
BCC7	0	17.4	56.5	26.1	0	100.0
BRC1	13.0	26.1	26.1	21.7	13.0	100
BRC2	0	39.1	26.1	26.1	8.7	100
BRC3	4.3	30.4	21.7	30.4	13.0	100.0
BRC4	8.7	26.1	21.7	30.4	13.0	100.0
BRC5	4.3	34.8	26.1	30.4	4.3	100.0
BRC6	4.3	21.7	52.2	21.7	0	100.0
PSC1	0	13.0	39.1	39.1	8.7	100
PSC2	4.3	30.4	39.1	21.7	4.3	100
PSC3	8.7	47.8	26.1	17.4	0	100.0
PSC4	13.0	56.5	13.0	17.4	0	100.0
CP1	0	26.1	17.4	39.1	17.4	100
CP2	4.3	13.0	17.4	39.1	26.1	100
TI1	4.3	52.2	34.8	8.7	0	100
TI2	8.7	34.8	21.7	17.4	17.4	100
TI3	13.0	26.1	21.7	17.4	21.7	100.0
PLRC1	8.7	26.1	17.4	30.4	17.4	100
PLRC2	4.3	26.1	39.1	26.1	4.3	100
PLRC3	13.0	8.7	17.4	21.7	39.1	100.0
PLRC4	4.3	26.1	34.8	26.1	8.7	100.0
PLRC5	0	17.4	39.1	26.1	17.4	100.0
CLC1	4.3	8.7	60.9	17.4	8.7	100
CLC2	0	34.8	39.1	13.0	13.0	100

Table A3. Note(s): Results are in percentage wise

Appendix 5

Codes	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Total
SMPE1	4.3	0	13.0	43.5	39.1	100
SMPE2	0	4.3	8.7	47.8	39.1	100
SMPE3	0	4.3	17.4	39.1	39.1	100.0
SMPE4	0	0	13.0	56.5	30.4	100.0
SMPSI1	4.3	0	30.4	39.1	26.1	100
SMPSI2	0	4.3	17.4	52.2	26.1	100
SMFC1	0	0	17.4	60.9	21.7	100
SMFC2	0	4.3	13.0	60.9	21.7	100
SMFC3	4.3	8.7	26.1	39.1	21.7	100.0
SMUB1	0	8.7	21.7	43.5	26.1	100
SMUB2	4.3	4.3	8.7	52.2	30.4	100
SMUB3	0	4.3	17.4	52.2	26.1	100.0
SMTR1	0	0	47.8	43.5	8.7	100
SMTR2	8.7	39.1	30.4	13.0	8.7	100
SMTR3	8.7	34.8	34.8	17.4	4.3	100.0
SMTR4	8.7	34.8	17.4	26.1	13.0	100.0

Table A4.
Results of usage
behavior for AES

Note(s): Results are percentage-wise

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