Journal of Business Research 129 (2021) 314–318

Contents lists available at ScienceDirect

Journal of Business Research

journal homepage: www.elsevier.com/locate/jbusres

The effect of technology, information, and marketing on an interconnected world

ARTICLE INFO

Keywords
Corporate social responsibility
Economy
Entrepreneurship
Innovation
Marketing
Organizational behavior
Technology

ABSTRACT

Technology is considered an asset for companies, and continuous technological innovation is one of the most effective ways to help firms achieve a competitive advantage. Innovation creates opportunities for entrepreneurship. Entrepreneurship may involve corporate social responsibility. Technology also affects all aspects of marketing. The integration of technology and marketing strategies can affect companies' success in a continuously changing environment. This special issue presents some recent studies of how technology can support improvement in various areas of business and management, including innovation, entrepreneurship, and marketing.

1. Introduction

Technology is considered an asset for companies (Capon & Glazer, 1987). Continuous technological innovation is one of the most effective ways to help firms achieve a competitive advantage (Martín-de Castro, López-Sáez, & Delgado-Verde, 2011). Foroudi, Gupta, Nazarian, and Duda (2017) cited the two critical constituents of digital technology as information quality and service convenience. Meanwhile, Yu, Lin, and Liao (2017) proposed a model describing the way that task characteristics and social interaction improve media richness, media experience, and media technostress, which in turn enhance information and communication technology (ICT) adoption behavior. In addition, the impact of ICT adoption behavior is moderated by information literacy and digital skills.

Moriarty and Kosnik (1989) reported that the world of high tech is characterized by high levels of market and technology uncertainty. They therefore coined the term *high-tech marketing*. In the same study, they proposed five issues facing high-tech marketers: How do we master an ever-expanding set of skills? How do we abandon obsolete knowledge and skills? How do we coordinate skills, resources, and information across functions in a company? How can inter-firm cooperation help to cope with high-tech and marketing changes? How can we provide consistency and continuity when facing continuing changes?

Capon and Glazer (1987) presented a case where the integration of technology and marketing strategy can affect company success in a continuously changing environment. Foroudi et al. (2017) showed that the relationships between digital technology, tangible/intangible assets, and marketing capabilities play a significant role in a company's growth.

Information technology has great potential to transform marketing through customization, consumer relationships, new market access, business-to-business collaboration, and other ways (Chang, Park, & Chaiy, 2010). For example, in the tourism industry, tourists tend to browse and then reserve accommodation, transportation, and other tourism products online (Arauz et al., 2016; Dewi et al., 2018). The Internet provides a meeting point for tourists and destination operators who can influence tourists' decision making (Jorge et al., 2018). Information disclosure through the Internet involves companies' participation in global competition (Manarte & Teixeira, 2011). The Internet effectively stimulates tourists to share their experiences, which can act as advertising to attract potential consumers (Yoga, Korry, & Yulianti, 2019).

There are key benefits of technology adoption for firms and customers. For firms, these benefits include personalization of marketing mix elements, better prediction of future trends, disintermediation and direct engagement, and productivity enhancement. For customers, these benefits include enhanced functional ease, greater personal relevance, greater traceability of products, and effective firm-customer engagement.

Discovering solutions to meet the challenges prevents marketing from becoming irrelevant (Kumar, 2017) and marginalized (Reibstein, Day, Wind, 2009) as both a discipline and an organizational function (Foltean, 2019). High tech has been applied in marketing. Augmented reality has been applied in marketing in the context of situated customer experience (Chylinski et al., 2020). E-retailing uses website personalization and social media for marketing (Oberoi, Patel, & Haon, 2017). Sensory marketing in a digital context is applied to enhance the customer experience (Petit, Velasco, & Spence, 2019). Regarding wearable devices, a study has shown that perceived visual appeal of the virtual reality experience with wearable devices has a positive and significant effect on behavioral intentions toward the site featured in the virtual experience. Perceived visual appeal has a positive effect on emotional involvement (Marasco, et al., 2018). A collection of papers in one issue of a journal explored the expansive technological enhancement in destination marketing (Li, Robinson, & Oriade, 2017).

Below, a summary is given to present the key insights of the selected articles on how technologies can assist improvement in various areas of

https://doi.org/10.1016/j.jbusres.2021.03.004

Available online 17 March 2021

business and management, including innovation, entrepreneurship, marketing, corporate social responsibility, the economy, and organizational behavior. Finally, this paper concludes by highlighting opportunities for future research in applying emerging technologies to various areas of business and management.

2. Contributions

2.1. Innovation

Sjödin, Parida, Palmié, and Wincent identify how firms can develop artificial intelligence (AI) capabilities for digital servitization. In-depth case studies of six leading industrial companies engaged in digital servitization are presented. The findings reveal three sets of critical AI capabilities: data organization capabilities, AI analytics capabilities, and AI business infusion capabilities. Each capability is developed through progressive creation of increasingly advanced routines. A framework for AI capability development for digital servitization is developed based on these findings. The framework illustrates the interdependencies between these AI capabilities, showing that firms must develop routines for each capability to successfully realize the full value potential of AI in digital servitization.

Grimaldi, Cricelli, and Greco propose an intellectual property (IP) strategic framework comprising three strategies: a defensive strategy, avoiding knowledge spillovers and building barriers to competition; a collaborative strategy, collaborating with other organizations and entering new markets; and an impromptu strategy, describing firms protecting their IP without a clear purpose. The empirical results show that most firms in the sample declare an "impromptu" IP strategy. Those without any IP protection strategy can be a barrier to outbound open innovation (OI). In addition, firms with a defensive IP strategy embrace outbound OI more than those declaring a collaborative IP strategy. Finally, firms with collaborative IP strategies outperform those with defensive strategies.

Ferreira, Fernandes, and Ferreira use a sample of companies covered by the 2014 Community Innovation Survey and apply econometric models to analyze the impacts of innovative project failure. The results show that innovation failure is negatively correlated with companies' experience and acquisition of external knowledge. The findings highlight the positive role that companies' accumulated experience has in the assimilation of knowledge flows.

Zeng, Skare, and Lafont present a study using data on 26 cities in the Yangtze River Delta region, China, over the period 2011 to 2017. They identify the regional ecological integration of green innovation efficiency and its related determinants for future sustainable growth for the first time. They use the Super-SBM method to measure the green innovation efficiency of the cities in the Yangtze River Delta region. The empirical results show that the green innovation efficiency in that region experienced steady growth over the period 2011 to 2017, suggesting that the Yangtze River Delta region is a real ecological pioneer in China. Next, they use a spatial evolution investigation to find that the green innovation efficiency among cities in the Yangtze River Delta finally realized regional eco-integration in 2017. Finally, they apply a spatial Durbin model to identify the determinants of regional eco-integration of green innovation efficiency.

Costa-Climent and Haftor propose a conceptual framework to examine value creation through the evolution of business model themes. This advanced framework characterizes business models and their themes of value creation as co-evolving within an evolving industry. The framework provides a set of propositions that specify how firms can create value by entering an industry, reacting to imitators, and co-evolving with the product market strategy and environmental factors.

Wang, Phillips, and Yang show how the Industrial Technology Research Institute (ITRI), a prominent international non-profit R&D organization, has designed a platform-based open innovation system to capitalize on its efforts to create economic and social value. They present a holistic framework from idea generation to commercialization. Through interviews, they highlight actionable descriptions of activities in each innovation stage to display an operational implementation of the end-to-end open innovation system. They find the following distinctive success factors: (1) managers examine their open innovation strategies and activities by viewing the open innovation process from a system perspective; (2) outside and inside advisors with investment backgrounds help commercialization planning; and (3) a neutral catalyst organization within ITRI is a critical player, maintaining the smooth flow of the end-to-end process. The study expands open innovation theory to take a system perspective and helps managers put system thinking in the end-to-end innovation process.

2.2. Entrepreneurship

Solomon, Bendickson, Marvel, McDowell, and Mahto use an agency theory lens to better understand how national policy can spur entrepreneurship. Guided by capitalist and socialist logic and ideals they investigate the direct and joint effects of market freedom and social spending national policies. In drawing from a sample of 21 countries spanning 2004 to 2011, they find that neither market freedom nor social spending alone positively impacts entrepreneurial activity. However, an interaction exists, as entrepreneurial activity is bolstered when enhancing market freedom and social spending complement one another. Findings suggest that mixed national policies that combine market freedom and social spending are best positioned to spur entrepreneurship.

Galindo-Martín, Castaño-Martínez, and Méndez-Picazo analyze the relationships between entrepreneurship, institutions, innovations, social climate, and economic growth through those phases due to the effects on entrepreneurs when setting up a new business or performing their professional activity. For the empirical analysis, 15 OECD countries and three periods were selected: a) prior to the economic crisis (2004–2006); b) economic crisis (2008–2010); c) post-crisis economic recovery (2014–2016). They first determine the variables that would most heavily influence entrepreneurs in the recessive economic phase. Second, the factors that most stimulate entrepreneurship in the expansive phase and motivate growth are also identified (Rey-Martí et al., 2016). Lastly, the analysis focuses on economic growth.

Welsh, Lanchimba, Fadairo, and Silva show that franchisors in Brazil use strategic signaling to attract potential franchisees and expand their network, in contrast with previous results regarding developed countries. Strategic signaling is associated with the context of rapid evolution, uncertainty, and institutional voids characterizing emerging economies, thus resulting in exacerbated information asymmetries. The study suggests that rather than the network organizational form, Brazilian franchisors use the contract design—more specifically, the royalty rate—as a signaling device.

Gu and Zheng reinterpret the environmental Kuznets model from an entrepreneurial perspective by using the simultaneous equations model to test the relationship between entrepreneurship, economic development, and environmental pollution using micro data. They construct a moderated mediation model to analyze the relationship between entrepreneurship and the three environmental effects. In addition, they consider the environmental Kuznets curve and entrepreneurial influences for different regions, industrial property, and property rights from the perspective of enterprise heterogeneity. The results show that there is an N-type environmental Kuznets curve in China's listed polluting enterprises. The direct effect of entrepreneurship promotes environmental pollution, but entrepreneurship exerts an adverse effect on the environment through environmental technological effects, scale effects, and structural effects. At the same time, environmental regulation reverses the positive effect of the moderated effect on environmental pollution and then alleviates environmental pressure.

Lanivich, Bennett, Kessler, McIntyre, and Smith examine the well-being of early-stage entrepreneurs across two studies. Using selfdetermination theory (SDT), they theorize that entrepreneurs' autonomy, job security, and resource-induced coping heuristic (RICH) have direct and interaction effects that shape their environment toward enhancing well-being. The results largely support the hypotheses. Interaction effects highlight that entrepreneurial well-being environments are conditional on the interplay of SDT-related factors. Three-way interactions show the RICH-buffered negative effects of low autonomy and job security on job satisfaction and financial well-being.

Orlandi, Zardini, and Rossignoli explore the actual rate of new venture failure in a context characterized by a high level of digital entrepreneurship. Employing three country-level databases, they investigate how different combinations of sociocultural propensity toward entrepreneurship, exposure to digital media, and digital infrastructure lead to entrepreneurial death. Longitudinal data on 23 European countries are analyzed using fuzzy-set qualitative comparative analysis. The findings suggest that in a context characterized by the presence of high levels of sociocultural propensity toward entrepreneurship and exposure to digital media, and the absence of high levels of technological and human digital infrastructure, the associated outcome is a high level of entrepreneurial death of new ventures.

Mendoza, Llopis, Gasco, and Gonzalez analyze entrepreneurship in Latin America. They study the economic figures for Ecuador and present the state of the art in research on Ecuadorian entrepreneurship. They collected qualitative and quantitative data on the opinions of entrepreneurs from all over Ecuador, who were asked about the advantages and disadvantages of being an entrepreneur. The data are used for the analyses, together with an explanatory model for the potential reduction of unemployment that can be attributed to entrepreneurs' characteristics.

2.3. Marketing

Baumert and Arias analyze how brand antiquity may be perceived by consumers as an indicator of quality. Only brands that sell quality products are supposed to survive in a competitive market in the long run. They model an experiment to empirically test whether this perception will result in a willingness to pay higher prices for products whose brands advertise the company's antiquity than for products from brands that do not. Their empirical results reveal that brand antiquity does indeed have a statistically significant effect on consumers' price setting.

Cruz-Cárdenas, Guadalupe-Lanas, Ramos-Galarza, and Palacio-Fierro establish the way in which the optimism and innovativeness of consumers (drivers of technology readiness) act on their tendency to use technology-based services. The study was carried out in two phases. In the first phase, three services were selected: online shopping, online banking, and online music streaming. In the second phase, the hypotheses were tested using a random sample of 754 adults. The results are consistent across the three structural equation models (one for each service). Optimism acts indirectly through the mediation of hedonic and utilitarian motivations. Innovativeness also acts through a similar indirect channel, but it also acts directly.

Bigne, Simonetti, Ruiz, and Kakaria determine the effectiveness of online advertising on social media. A first study based on eye-tracking and electroencephalogram analysis was conducted to assess whether there were differences in visual attention and engagement when an ad was embedded in TripAdvisor content. Their findings show that synergies between social media content and advertising content positively affect users' visual attention. A second study, using an online survey, was carried out to assess the impact of congruent/incongruent ads on ad recall and, using eye-tracking, on visual attention.

Irún, Monferrer, and Moliner use three complementary fields of study to enhance scholars' understanding of public–private partnerships (PPPs): risk management, governance management, and the behavior of private participants. They propose a causal model in which network market orientation acts as a previous relational governance mechanism, enabling the achievement of a better perception of risk by the private agents involved. The model was tested using SEM for a sample of 180 agents involved in PPP projects in China. The results confirm the authors' assumption: By placing inter-organizational trust as the central variable, the effect of network market orientation on companies' perceived risk occurs through the reinforcement of their entrepreneurial orientation. The findings provide researchers and managers with practical insights into the development of PPP projects from a relational perspective.

Hultman, Oghazi, Papadopoulou, and Opoku investigate how customer perceptions of parent brands influence the perceived value of brand extensions in the hotel industry and how the focal relationships are moderated by the nature of the brand extension in question. Based on brand equity reasoning, they propose that perceived positive brand attributes, awareness, positive attitudes, and loyalty toward the parent hotel brand positively relate to higher perceived value of the brand extension. Moreover, these positive relationships grow stronger in cases of step-down extensions than in cases of step-up extensions.

Mostaghel and Chirumalla identify the factors that impact customers' ethical purchase intentions in circular business models for retail. Based on macro-theories of human behavior, they propose a theoretical model that could determine customers' ethical purchase intention toward retailers with the circular business model. The two antecedents of attitude are value and awareness in the proposed research model, and personal characteristics moderate the relationship between attitude and intention.

Mariani, Styven, and Nataraajan adopt a social comparison theory perspective to examine the drivers of social comparison frequency on Facebook among international travel bloggers who use Facebook for their travel blogging activities. Their empirical results suggest a strongly positive and significant relationship between social comparison frequency (SCF) on Facebook and the ability dimension of social comparison orientation, as well as between SCF and opinion leadership. While professional travel bloggers are more likely to be opinion leaders, non-professional travel bloggers tend to compare themselves with others on Facebook considerably more often. Overall, it seems that Facebook is deployed in a strategic way by travel bloggers, who try to enhance their own visibility and that of their blogs vis-a-vis international competitors.

Méndez-Suárez and Crespo-Tejero investigate why banks maintain unprofitable customers, applying real options theory to value their customer lifetime value (CLV) and assess whether there is a threshold above which it is economically desirable to abandon such customers. The empirical results support the idea that banks act according to real option theory in their decision to maintain apparently unprofitable customers and that optimal divesting points exist. This finding can help academics and practitioners develop a more rational understanding of firms' decisions in terms of maintaining customers.

2.4. Corporate social responsibility

Velasco Vizcaíno, Martin, Cárdenas, and Cárdenas propose that corporate frugality, multitasking, and organizational citizenship behavior (OCB) are the capabilities to foster employees' positive attitudes toward corporate social responsibility (CSR). In addition, key organizational factors (servant leadership and job satisfaction) are critical variables to enhance the desired effects in facilitating positive responses from front-line employees to CSR programs. Their empirical analysis suggest that firms should develop organizational values and managerial processes oriented to cautiously administer resources (corporate frugality) and to develop multitasking capabilities instead of task specialization (monochronicity) as core factors to cultivate OCB, which further positively impacts front-line employees' attitudes toward CSR programs. The proposed moderating effects from managers' servant leadership and employees' job satisfaction receive support from the analysis. When employees receive strong support from their management team, the positive relationship between OCB and CSR becomes stronger. Furthermore, when front-line employees feel satisfied with their jobs, the relationship between OCB and CSR strengthens. Post-hoc analysis from the proposed model suggests that OCB mediates the relationship between monochronicity and CSR.

Úbeda-García, Claver-Cortés, Marco-Lajara, and Zaragoza-Sáez analyze the relationship between CSR and firm performance, considering the direct relationship and possible mediation by variables such as green human resource management (GHRM) and environmental outcomes. The empirical results confirm a direct positive relationship between CSR and performance. In addition, they find an indirect effect on this relationship through the mediation of GHRM and environmental outcomes.

Yáñez-Araque, Hernández, Gutiérrez-Broncano, and Jiménez-Estévez seek to ascertain whether the relationship between CSR and economic performance is significantly different for family and non-family micro, small, and medium-sized enterprises (MSMEs). The empirical results show that under equal commitment to CSR, family MSMEs obtain a greater impact on economic performance arising from CSR actions than non-family MSMEs. First, they find that CSR targets economic performance simultaneously taking into account the economic, social and environmental dimensions for family and non-family MSMEs. Second, family businesses have an additional incentive to get involved in CSR actions, since this involvement will be reflected in economic results with greater intensity than in non-family businesses.

2.5. The economy

Zhang, Liu, and Huang measure China's factor return rate via a time-varying elastic production function model. This model is used to interpret the basic experience of China's sustained rapid economic growth since the reform and opening up. Then, combining Lewis economic theory and demographic dividend theory, the authors deduce the decomposition formula of the economic driving force. They find that China's abundant supply of labor endowment prevents the diminishing return on capital assumed by neoclassical growth theory, such that the high return on investment can be maintained. Since the reform and opening up, the average contribution rates of capital, labor, and total factor productivity to economic growth have been 67.01%, 10.38% and 22.61%, respectively. Under the new normal, the driving force of development has gradually shifted from resource and low-cost labor input to technological progress driven by innovation.

Monfort, Villagra, and Sánchez explore the relationship between the creation of a corporate foundation and the corporation's stock market value. The study examines how a corporation's market value is influenced by philanthropic behavior and its communication, brand architecture, and business sector. An event model calculates the cumulative abnormal returns (CARs). A dependence model analyzes the relationships between CARs and selected characteristics. The findings point to the following factors that increase the positive impact on the stock market: (1) omitting mention of the foundation's financial resources from announcements about the foundation's creation and (2) basing the brand architecture on an endorsed brand strategy.

Baixauli-Soler, Belda-Ruiz, and Sanchez-Marin study the heterogeneity in family firms to analyze whether noneconomic aspects to meet the family's affective needs (known as socioemotional wealth or SEW) influence debt financing decisions. In the context of private medium-sized family firms, their results indicate that family firms that are most concerned about preserving SEW have lower leverage. The presence of a family CEO strengthens the negative SEW–debt relationship. Moreover, CEO gender also plays an important moderating role: female CEOs strengthen the negative effect of SEW preservation on leverage. The findings are consistent with the view that SEW is the point of reference in the financial decisions of family firms and that the CEO acts as a moderator of the SEW effect on debt financing.

Otero-González and Durán-Santomil analyze whether the combination of qualitative and quantitative information can help identify the mutual funds that beat their peers. The empirical results show little evidence when using ratings alone. The selection of mutual funds improves when choosing those with a positive parent, process, and price. Finally, the combination of star (quantitative) and analyst (qualitative) information, as well as its pillars, improves the screening of mutual funds.

2.6. Organizational behavior

Alpenberg and Scarbrough report on the nature of dispersed and integrative practices in collaborative work. They use the situation of changes in the use of collaboration to investigate the dispersed integrative concept by in-depth interviews and observations in organizations, employing the high collaboration work method (Soriano & Martínez, 2007). They show that the introduction of collaborative work is followed by the binding (or unbinding) of dispersed practice with integrative practice to form a new integrative practice containing a social component. The results support the importance of the practice theory lens in the study of organizations as a generator of novel insight. The results also move practice theory forward by developing theory about changes in dispersed and integrative practices and their relationship with each other. For practice, it suggests that business methods may in some cases include not only technical aspects but also specific social aspects. This insight may lead to an understanding of why some methods fail when widely implemented, even though they had been very successful at the development sites.

Parker and Du Plooy evaluate the role of games in developing psychological safety and examine the relationship between psychological safety and performance in the workplace. They also examine how psychological safety influences team learning. The context for this study is a large resource-constrained healthcare organization based in an emerging economy. A survey instrument was used to collect data from employees before they played the game, and then again after the game. The authors find that participation in the game results in a significant increase in the level of psychological safety experienced by participants. Additionally, they find that the game has a positive impact on team learning and performance.

Soares and Mosquera-Conde examine both organizational and individual career practices to identify their differentiated effects and their joint effects on three individual outcomes: organizational commitment, turnover intentions, and burnout. The role of perceptions of internal employability as a mediator in this relationship is also tested. For the relationship between organizational career management and outcomes, the results indicate that organizational support is associated with the three dimensions of organizational commitment. Colleague/superior support is associated with affective commitment, turnover intentions, and the three dimensions of burnout. For the relationship between individual career management and outcomes, networking is associated with affective commitment, turnover intentions, and depersonalization. Critical expertise is associated with continuance commitment and exhaustion. Finally, career guidance is only associated with affective commitment. Perceptions of internal employability only mediate between three practices (organizational support, superior/colleague support, and networking) and all outcomes except continuance commitment.

3. Conclusions

In the interconnected world, the gap between technology and numerous business and management issues has been well documented. This special issue presents some recent studies of how technologies may support improvements in various areas of business and management, including innovation, entrepreneurship, marketing, corporate social responsibility, the economy, and organizational behavior. More research is being conducted to explore our understanding of these issues and their solutions. Particularly, emerging technologies have been applied to various areas of management and business. Examples include the application of AI and the Internet of Things to the creation of new market demand (Park, 2017) and the role of technology innovation in business performance (Soriano, 2010; Soriano & Peris-Ortiz, 2011; Kim & Choi, 2018). These studies highlight the opportunities for future research in applying emerging technologies to relevant topics.

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