Commercial Applications in Digital Communications

Charles Steinfield
Michigan State University, US

Abstract

Where in the past the field of digitally mediated communication was focused narrowly within organizational settings and on its impacts on interpersonal communication, it is now clear that the commercial implications of such communication are vast and pervasive, permeating every aspect of the economy. This entry provides an overview of the topics addressed in the Commercial Applications theme of this Encyclopedia covering six areas: business-to-business networks, electronic commerce, online marketing, online content delivery, communication services, and mobile communications. Research related to these topics is needed to understand how digital technologies shape social and business practice, and to better inform policies and practice. The entries offer a comprehensive introduction to the work that has been done and an agenda for where to take research in the future.

Keywords: digital technology; media; communication networks; computer-mediated communication; digital media; electronic commerce; electronic marketplace; business and management

Introduction

The Commercial Applications topic in this Encyclopedia provides a broad introduction to the commercial applications of digitally or computer mediated communication (CMC). CMC research has a long tradition in the field of media and communication research, with studies examining aspects of CMC use in organizational settings forming the initial core research area (Rice, 1980; Steinfield, 1986). Theoretical perspectives emphasized understanding of how factors such as task characteristics and the social and organizational context influence adoption and use of CMC (Daft & Lengel, 1986; Fulk, Schmitz, & Steinfield, 1990). With the rise of the internet and the spread of CMC to the general public, communication researchers, led by Walther (1992) and his work on hyperpersonal effects in CMC, began applying theories of interpersonal communication to help understand the unique qualities of CMC and its effects on communication and relationship development.

Despite this extensive focus on human-to-human communication via CMC, the field of media and communication has been somewhat less present in the body of work examining the vast commercial implications of digitally mediated communication – in commerce, in media, and in public communication services running over the internet and mobile networks. CMC systems support a wide range of interactions between buyers and sellers and between content creators and content consumers. Indeed, it would be difficult to imagine modern-day economic exchanges that are not mediated in some way by digital media. The entries under the Commercial Applications topic in this Encyclopedia make it that much of the impact of CMC comes from the computational and connectivity capabilities that computers and digital networks provide, expanding on the original notion of mediation that makes up the middle term in CMC. For example, algorithms that support such functions as information search, aggregation, the matching of buyers and sellers, and the provision of data driven recommendations through such techniques as collaborative filtering, have revolutionized the way that many types of social and economic exchanges occur in modern society.

Many of the streams of work on the commercial aspects of digital communication that examine the far reaching implications of pervasive computer networks come from other fields and disciplines. The Commercial Applications topic introduces work from fields and disciplines including information systems, information sciences, and marketing, as well as from media and communication scholars who address this area. The entries contributing to this topic address various facets of digital communication in commercial contexts such as business-to-business (B2B) networks, business-to-consumer (B2C) electronic commerce, online marketing, online content delivery, communication services, and mobile communication.
Many of the initial applications of digital networks were first observed in organizational settings, given the high costs associated with the implementation of computer networks in earlier periods. The widespread diffusion of computer networks was largely based on Ethernet standards, the adoption of the TCP/IP (transmission control protocol/internet protocol) standard, and the opening of the internet for commerce in the early 1990s. Prior to these significant developments, most digital network applications were to be found on private telecommunications networks in business settings. As private networks were extended to incorporate external trading partners, discussions of alternative forms of organizational governance emanating from transaction cost economics theory, most commonly contrasting markets with hierarchies, were adapted to their electronic versions. Malone, Yates, and Benjamin (1987), in particular, argued that the growth of interorganizational computer networks would enable both electronic markets and electronic hierarchies to flourish, although the efficiency benefits from market forms of governance would result in a more rapid growth in this type of B2B trading arrangement.

Market-like arrangements rely on the electronic brokerage effect of electronic networks whereby the network facilitates the matching of buyers and sellers. As these authors noted, production costs are lower using markets, given the economies of scale and the benefits of competition, but coordination costs can be higher than in hierarchical arrangements because of greater transaction costs such as search, negotiation, and settlement. However, electronic markets reduce transaction costs such as the costs of search, thereby lowering coordination costs. B2B electronic marketplaces appeared in many industries and, although many failed in the dot.com crash of 2000–2001, more than 800 remain. Electronic hierarchies, characterized by tighter integration and longer term trading arrangements between buyers and sellers, also became common, especially in the context of supply chains built on electronic data interchange (EDI) standards. The ease of incorporating new business trading partners into such networks has also been facilitated by the emergence of lower cost standards such as those based on XML (Extensible Markup Language), often developed by industry trade associations to take into account the particular types of transactions and terms used within a specific industry (Markus et al., 2006).

As shown in the entries in this area, researchers have explored many topics that emerge from the growing use of electronic networks in B2B exchanges, ranging from inquiries into the structure and function of the many diverse forms of B2B networks to questions about the impacts of B2B networks on buyers, sellers, and overall economic efficiency. Moreover, research has explored the conditions—market structure, type of goods exchanged, participant strategic behavior—that influence organizations’ use of B2B markets, as well as the effect of technological and institutional changes (e.g., development of
standards) on their design and use. Electronic commerce standards may level the playing field, allowing smaller companies with fewer financial and technical resources to benefit from the efficiencies of electronic transactions among businesses. There are enormous implications of research in this domain; the US Department of Census, for example, reports that nearly 50% of US manufacturers’ shipments were conducted through electronic commerce in 2011, amounting to US$2.7 trillion. The situation is similar in most upper- and middle-income countries. Understanding what this shift to electronic exchange implies for the world’s economies will be a critical issue for years to come.

Electronic Commerce

Electronic commerce – or e-commerce – extended rapidly into the B2C domain following the opening of the internet to commercial traffic, the widespread diffusion of personal computers, and the successful diffusion of broadband networks into the world’s upper- and middle-income economies. In the wealthy regions of the world, growth in B2C e-commerce has outpaced traditional retail commerce growth for nearly two decades. In the United States, for example, the US Department of Census reports that online retailing has expanded from less than 1% of total retail revenues in 1999 to more than 6% in 2013, and continues to grow at double-digit rates.

The growth of B2C e-commerce has led to research on an ever increasing set of topics regarding its role in the economy and society. Initially many researchers questioned whether online commerce supported entirely new forms of businesses, as evidenced by the emergence of new forms of business models. The business model literature emphasized the basic value proposition an online company offered to consumers, identified the revenue sources through which it would sustain itself, and clarified the strategy it would use to compete in a sector. Although there clearly are innovative approaches adopted by online companies, it remains an open question whether e-commerce business models are distinct from the basic models used by offline businesses, or are the same approaches, amplified by the ability of online companies to leverage the broad reach, lower transaction costs, and computational power of the internet.

A major research thrust related to B2C e-commerce focuses on trust formation in online contexts. Although many successful e-commerce companies are established brands with loyal customer bases, new entrants face the challenge of building trust without the traditional methods of signaling trustworthiness, such as having an attractive physical store, professional staff, the ability to allow customers to physically inspect merchandise, the ease of product returns, and the ability to engage in purchases without the necessity of collecting customers’ personal information. Building trust in an online context requires attention to other types of signals that are not easy for dishonest or lower quality
sellers to imitate. Having an easy to use and attractive site is important, but in today’s environment this is not enough. Other factors, including the use of third-party assurances and the effective management of an online reputation, are also important.

Reputation is such a critical antecedent to trust that it has become an important topic of research in the e-commerce arena in its own right. Early work on reputation systems sought to explain how it was possible to build enough trust on services such as eBay that strangers would be willing to engage in economic exchange for hard to value items like collectibles and used goods (Resnick et al., 2000). Feedback systems, ratings, and other techniques aim to provide users with the tools needed to assess a potential trading partner’s trustworthiness.

Consumers must also be convinced that their personal information will be secure with an online business, a matter that has become increasingly difficult to ensure as evidenced by the numerous data breaches that plague the online retail industry. Although much of the research aimed at improving online security is undertaken from a technical perspective, in fact, the behavior of both buyers and sellers can have significant effects on security. Additionally, third parties play a prominent role in the establishment of a secure e-commerce environment. One important class of third-party players focuses on the ability to support online payment for goods and services. Many forms of online payment exist, broadly grouped into those involving real or virtual currencies. Examples of the former include credit and debit cards, while the latter is exemplified by new nongovernmental currencies such as Bitcoin. Forms of payment vary in terms of risk, convenience, and cost, and the frequency of use varies across national contexts. For example, credit card payment remains common in the United States for e-commerce transactions, whereas online banking electronic payments account for the majority of e-commerce payments in the Netherlands. Continuing innovation, often involving the creation of value added services to facilitate online payments, such as through e-wallets, is necessary to reduce risk, make online payment more convenient, and lower transaction costs associated with payment processing.

One advantage that is often ascribed to online vendors in the e-commerce literature is their ability to offer an almost infinite product selection without the accompanying inventory holding costs. Indeed, Amazon’s first webpage highlighted the more than one million book titles that could be purchased from the site, a product assortment that no physical bookstore could match. The ability to aggregate buyers across markets, incur little to no inventory holding costs for less popular items, and freedom from shelf-space constraints, has encouraged the growth of long-tail markets (Anderson, 2008). In long-tail markets, revenues and sometimes profits can come from the growth in sales of less popular products and less dependence on a relatively smaller number of “hits.” With this expansion in choice,
however, come higher search costs because consumers are less likely to know what they want beforehand. Hence, long-tail markets depend on the ability to recommend products to consumers based on their tastes, past purchases, and their similarity to other buyers. This situation has given rise to research on recommender systems. The rising importance of recommender systems has been especially evident in the sale of online content to connect consumers with new music, films, and books, but their use is widespread across many types of products. Ongoing research seeks to improve the performance of algorithms guiding recommendations, using a wide range of data gleaned from users’ behavior that can be contingent on many contextual factors such as time of day, weather, location, social connections, and so on.

As e-commerce permeates through the industrialized economies, one of the earliest questions about its impact on markets remains a focus of research: How will it reshape value chains? Are some types of companies subject to displacement or in need of redefining their role in value chains? One has only to look as far as the local bookstore, record store, and travel agencies to find examples of threatened retail intermediaries that have seen much of their business lost to online competitors. Disintermediation was highly anticipated in the dawn of e-commerce (Benjamin & Wigand, 1995), although the reality turned out be more complex when new intermediaries quickly appeared to leverage the reduced transaction costs of the internet in order to offer downstream channel services for producers (Sarkar, Butler, & Steinfield, 1995). Researchers in this area are finding that online intermediation is also likely to be performed by traditional offline intermediaries that move online in a process termed re-intermediation. Online intermediaries have also appeared to help producers manage the growing complexity of global supply chains, helping companies to manage supply chain risk and focus on their core competencies.

Online Marketing

Digital technologies play a role in commercial exchange that extends well beyond the direct facilitation of transactions between buyers and sellers. Consumers are spending an increasing amount of time online consuming digital media, and audience measurement sites estimate that in 2013 in the United States, the average time spent consuming digital media exceeded five hours per day, surpassing television viewing for the first time (eMarketer, 2013). A large proportion of consumers’ online activity is also spent interacting with social media, including interactions with content, peers, and organizations. This movement to online consumption of information and media content and online interaction with people and businesses on social media has important implications for commerce. It offers new possibilities to advertise products, support two-way communication and information exchange between producers and
consumers, and enable producers to learn more about consumers’ wants and needs through their online behaviors. This enables new approaches to marketing that support both online and offline commerce, and further highlights the role of digital media and communication in commercial exchange.

As a result of consumers’ increasing time spent with digital media sites, it is no surprise that online advertising has experienced dramatic growth over the past decade. In markets such as the United States, ad spend on other media is now eclipsed by spending on online advertising, which includes a wide variety of types of online advertising, such as email promotions, display ads posted on websites, classified ads on sites such as Craigslist, search ads, mobile ads, and lead generation. Search advertising accounts for the greatest amount of ad spend. One of the key advantages of online advertising over traditional one-way mass media is that it is easier to track responses to campaigns so that advertisers can better calculate return on investment. The rise of search advertising has encouraged a shift in industry practices, driving advertisers to move away from a focus mainly on exposure based strategies common in traditional media to pay-per-click forms of compensation. An example of pay-per-click advertising can be seen in Google’s popular AdWords service, which implements a real-time auction to determine which advertisers’ ads appear alongside organic search results when users type specific search terms. Advertisers only pay when someone actually clicks on the ad, not each time it is displayed. Lead generation online has also evolved into a pay-per-performance approach, where advertisers only pay if the ad results in a new customer, not just a click.

Marketing in online contexts includes more than the paid placement of ads. Social media sites are rich sources of word-of-mouth (WOM) information that can influence attitudes and subsequent purchasing behavior. Sophisticated marketers seek to harness this WOM, not only by “listening” for comments that can alert them to consumers’ opinions about their products and services, but also by seeking to create incentives for their loyal customers to influence their social network in positive ways. Rewards for “likes” on social media sites such as Facebook are an example of such an incentive. When consumers are empowered to create content on the sites of producers, it can also lead to the co-creation of products and services and outsourcing of effort aimed at the provision of improved customer service, such as when customers post “how-to” comments on vendor sponsored forums.

The capture, curation, and analysis of data generated by user behavior online, as users both browse and participate in social media, enables marketers to build increasingly accurate models of consumer preferences. Such “Big Data” has revolutionized online marketing practices, allowing online businesses to engage in the creation of highly personalized content, the provision of extremely targeted ads that are based on actual consumer behaviors, the monitoring of user-generated content to gain
insights into emerging tastes and product preferences, and the ability to head off problems through immediate notification of customer related incidents so that action can be taken before situations escalate. The marketing research community is struggling to accommodate the role of Big Data in marketing theory: There is a need to move beyond prediction models to provide better explanations of behavior, but there are also difficulties obtaining access to the requisite data since so much is proprietary. Even more problematic, however, are the policy and ethical issues raised by Big Data marketing practices as it becomes ever more feasible to identify individuals and collect personal details of their online behavior in ways that represent severe intrusions into their privacy.

Online Content Delivery

The commercial implications of digitally mediated communication are especially potent for the content industries such as newspapers, books, music, and video, given the transition of the underlying content to digital formats and the ease of distribution of digital media over data networks. The initial response in some industries such as newspaper publishing was to treat the internet as a supplemental channel for freely distributed content supported by the hopeful gains in advertising revenue. Actual advertising revenue did not match expectations, however, and the result was a growing cannibalization of newspapers’ subscription and printed advertising revenue base that many claim is threatening the very existence of the industry. In its most recent “State of the Media” report, for example, the Pew Research Center Project for Excellence in Journalism found that printed newspaper advertising revenue in the United States in 2012 was just 45% of the total in 2006 (Pew Project for Excellence in Journalism, 2013). Pew research also shows that half the American population now obtains its news via digital sources (Pew Project for Excellence in Journalism, 2013): As more and more readers turned to online news sources drastic action was needed. Despite having provided a virtually free product for online readers for a decade or more, the newspaper industry in some countries including the United States and the United Kingdom has started to implement paywalls in a bid to restore profitability. The industry is fundamentally changing, however, as there are many new sources of news online beyond the websites of newspapers, and the consumption of news is now heavily influenced by users of such social media sites as Twitter and Facebook. Ongoing research in this area focuses on better understanding how people consume news online and from what sources, as well as on what the most appropriate business models should be for the newspaper industry.

The book publishing industry has also undergone significant change because of the rise of digital distribution and consumption, and in many respects was the “canary in the coal mine” when it came to observing the potential impacts of e-commerce on traditional retailers. Large effects are visible across
the book industry value chain, as the online intermediaries – mainly Amazon – have come to dominate book retailing. This domination affords Amazon considerable market power, which it has used to move into the next phase of book distribution using e-books and Kindle display devices. Moreover, it has expanded beyond its initial distribution role in the book industry value chain to also engage in a gatekeeping function by working directly with authors in the publishing of e-books, thereby threatening publishers. The growth of e-books and e-readers has also led to a host of new entrants into the book industry value chain, led by device manufacturers such as Apple that are seeking to provide content to encourage the sale of hardware. Among the many research questions that stem from work in this area are questions about the viability of independent bookstores, strategies to avoid copyright infringement, and approaches to storing content in device-neutral formats.

Finally, the music publishing industry shows a similar tale of online distribution coinciding with a rapid decline in music distributed on physical media such as CDs. Indeed, the electronic distribution of music occurred much earlier than e-books because of the development of audio encoding standards such as MP3. Unlike the book, film, and television industry, which gave rise to online intermediaries such as Amazon and Netflix that began with physical distribution of books and DVDs, online intermediaries in music emphasized digital distribution. Moreover, the early online music intermediaries such as Napster and Kazaa confronted both the music publishing industry and music retailers not through the sales of music, but the free sharing of copyrighted content through peer-to-peer (P2P) networks. These networks were blamed by the music industry for a massive decline in sales that affected not just music retailers, but also the publishers and artists. However, despite the correlation between the introduction of P2P networks and sales decline, demonstrating that the former caused the latter proved to be difficult. One widely cited study of the effect of downloading on actual CD sales, for example, found little evidence of a direct impact, attributing the decline to other factors such as greater competition from other sources, such as video games (Oberholzer-Gee & Strumpf, 2007).

Following an aggressive legal effort by the music recording industry, most of the well-known P2P file sharing networks are no longer operating. In addition, new online retailers such as Apple, which emphasize the legal sales and online distribution of copyrighted music, have flourished, and online music sales now exceed offline sales. The industry still faces many issues raised by digital media – how to reconcile the album format with the ability to unbundle music, how to monetize digital radio services such as Pandora and Spotify, and how to minimize file sharing without inconveniencing consumers who want to listen to purchased music on the multiple devices that they own. Other forms of content are equally impacted by digital distribution, including film, television, and games, and new intermediaries
are bringing similar shifts to the value chains of these media as well, with significant implications for the industry and the consumers’ experience.

Communication Services

The commercial implications of digitally mediated communication extend into many other areas of people’s lives than their interactions with online sellers of goods and content, including access to government services, health services, and basic communication services between individuals and organizations. These examples illustrate just how pervasive the role of digital media and communication have become, influencing nearly every facet of modern life in the wealthy industrialized societies, and, with the growth of mobile communications and the many services that depend on mobile networks, in low- and middle-income countries as well. The entries focusing on the area in this Encyclopedia address e-government, e-health services, internet telephony, and online collaboration.

Governments have a strong interest in taking advantage of digital media and communication as tools to inform and connect with their constituents, especially given the ever increasing pressures to reduce spending that characterize political debate around the world. The lower transaction costs afforded by digital transactions hold the promise of enhancing the provision of services while, at the same time, reducing public expenditures for doing so. Yet a careful analysis of e-government services quickly reveals how the provision of services in this domain is quite distinct from traditional e-commerce on many critical dimensions. Governments are not free to “cherry-pick” the most profitable target audience for their services, but have to make them available to everyone. Citizens also are not able to choose an alternative supplier of these services that might be higher in quality or less costly. The transactions are often complex because they are derived from the law and must meet requirements not always imposed on commercial e-commerce companies. In addition, a citizen may need to interact with several sites or agencies for a particular purpose. These factors increase the complexity of providing e-government services, and help to explain why governments have not kept pace with the private sector in their use of online services. Despite these challenges, researchers in this area note that e-government services are evolving from the simple top-down provision of information to constituents to include more transactions (such as renewing a license, or paying tax bills), to more complex communication and deeper engagement with citizens. Solicitation of public opinion, crowdfunding for candidates and other initiatives, and the use of networks for surveillance and to monitor compliance with the law are just some of the evolving ways that online services and government action intersect. How these new types of applications, often occurring through social media and online forums, will influence not only
government efficiency, but other aspects of the political process such as shaping policy, influencing elections, and protecting citizen rights, are critical questions for media and communication researchers.

The extension of digitally mediated communication into some of the most personal aspects of peoples’ lives is also illustrated in the dramatic rise of e-health services. Nearly three-quarters of Americans, for example, search for health information online according to recent Pew internet surveys. However, e-health services represent more than the provision of health information online. In addition to online services that serve to educate the population on health related topics, e-health services can encompass a range of applications, including those aimed at behavior change, services that help patients to better manage their health, services that equip healthcare providers with better tools for monitoring patients and their compliance with treatment regimens, and new surveillance methods to monitor overall public health. With the growth of mobile applications and smartphones, many e-health services now move about with patients providing timely reminders and alerts. Much of the research in this area addresses how to design these services to enhance their usability and the prospects for adoption since the ensuing benefits will otherwise not materialize. Additionally, new applications are emerging that interact with sensors and send time-critical data back to healthcare providers, offering a heretofore unmatched capability to monitor and intervene to improve patient health. Such capabilities raise concerns regarding privacy, but also hold promise for expanding the reach of healthcare, lowering costs, and improving health outcomes.

The provision of basic communication services is another fundamental commercial activity that has been reshaped by online service providers. Initially, the digitization of the telephone network from the backbone network and switches connecting with the local access networks was a largely invisible development for users of plain old telephone service (POTS) and telephone subscribers continued to use their telephones in much the same way as when the network was analog. With the popularization of internet telephony, however, the many new affordances of internet telephony are quite visible to end users: Video conferencing, instant messaging, screen and file sharing, and other collaboration tools all become possible with smart devices connecting via the internet protocol. The cost savings from Voice over Internet Protocol alone have encouraged both businesses and home consumers to swap their legacy fixed line service for new services that often come bundled with their broadband service. Network operators such as AT&T in the United States are exploring the possibility of ending legacy POTS fixed line service, in favor of an all IP based service delivered through broadband. The implications for communication policy are profound, as many countries require the provision of basic communication services even to the most rural areas, and in the wealthy industrialized world this was largely
accomplished via POTS. Although the policy and economic research issues have been at the forefront in research in this area, the resulting changes in peoples’ everyday communication practices enabled by these new services also merit considerable research attention. New patterns of teleworking, maintenance of long-distance relationships, and the opportunity for innovation in B2C commerce are all likely to follow this transition.

The introduction of computer supported collaboration in the workplace has fostered new working arrangements with a growing dependence on virtual teams. Research in this area reveals how such tools influence distributed team interaction by incorporating features that extend beyond basic communication support, and that seek to mitigate some of the social problems that groups can experience when engaging in collaboration. For example, features that provide awareness of others’ actions on group artifacts (e.g., system alerts when someone has looked at or commented on a file) help to address the information distribution and “social loafing” problems that often plague distributed teams. Likewise structured brainstorming modules built into collaboration tools can enhance team based innovation processes. Importantly, enterprise social media systems are being adopted widely by organizations that serve to integrate formerly separate collaboration tools and function as a platform upon which new collaboration services can be introduced (Leonardi, Huysman, & Steinfield, 2013). Such larger scale collaboration systems have the potential to enhance boundary spanning activities within and across organizations, strengthening efforts to disseminate information, create more diverse and distributed teams, stimulate innovation, and shape organizational cultures in ways we are just beginning to understand. Positive outcomes are by no means guaranteed, however, since such systems can fail to achieve critical mass, lead to superficial contributions, exacerbate information overload, and encourage excessive surveillance of employees.

Mobile Communications

No discussion of the commercial aspects of digitally mediated communication can be complete without acknowledging the disruptive and pervasive impacts of mobile communications technologies and services. Mobile communication services have reshaped the telecommunications industry, inexorably replacing fixed line telephone services in the wealthy industrialized countries while serving as the primary telephone service in low- and middle-income regions, effectively bypassing the need for expensive local access networks. The impacts go well beyond the simple substitution of one form of network service for another: Mobility and portability represent distinct affordances that result in new communication practices. Telephones are no longer household devices shared by family members in wealthier countries although in low-income countries there is much evidence of sharing mobile phones.
Telephones now serve as personal devices that function as conduits for a plethora of services previously not feasible in the fixed line model.

The introduction of new types of services through mobile phones occurred very early with the advent of the first short message system (SMS) services. Despite the technical limitations, text messaging became a source of unanticipated revenue that offered low-cost, person-to-person communication. This was adapted to support many innovative business services including in areas such as advertising, promotions, polling, and customer service. Mobile operators expanded their approach to mobile service provision, first through portals relying on “walled gardens” for content and service selection, followed by more open approaches that connected to the broader internet once mobile networks supported IP traffic. New players have entered the fray using the app store model, following the introduction of smartphones into the market. Mobile commerce applications are providing users with many commercial services, ranging from accessing digital media content in audio, video, and text formats, mobile access to social media, mobile advertising, mobile shopping, mobile games, mobile banking, mobile payment, and even mobile learning and mobile health services. Within organizations, smartphones accessing mobile networks further support a wide range of collaboration tools, sales force support, and logistics support, among other mobile workforce applications.

The many mobile commerce (m-commerce) applications illustrate the challenges that designers face in creating useful applications for small, portable devices. Initially, the human–computer interaction (HCI) community was convinced that mobiles were primarily good for short duration, more immediate messages of low complexity, leaving the longer duration, more complex content for the larger screens and greater processing power of desktops. However, with the advent of larger smartphones and notepad computing, such distinctions may no longer be as relevant. With the integration of global positioning systems (GPS) and other methods of determining location, many new types of services place an emphasis on integrating the subscriber’s location into the services offered. Using geofencing techniques that select appropriate content based on proximity to the user’s physical location, such services increasingly blur the distinction between online and offline commerce. Physical retailers, for example, can provide product promotions aimed directly at those who are within a specific distance of their shop. Location is but one form of context: As smartphones become more intelligent and equipped with sensors, service providers can know if the subscriber is at motion or at rest, what the temperature is, or even if there are other people nearby, and can tailor their promotional content appropriately.

Given such new capabilities and affordances, it is not surprising that new social and business practices are emerging. Researchers have investigated these new practices, which range from the
growing reliance on microcoordination of activities to new forms of social engagement such as mobile microblogging and social media use, to new ways of interacting with businesses. For example, location sensing has been co-opted as a marketing tool to support check-in services such as Foursquare, offering businesses a way to leverage a user’s social network to increase business traffic in physical locations. In the workplace, new practices for mobile workers are also evident because such services support real time updating of work events through microblogging (e.g., Yammer), and better collaboration. The arrival of the nomadic worker who can use a coffee shop as an office is a prime example of this new mobile lifestyle.

Such social practices lead to many important research issues: How can retailers encourage adoption of m-commerce and balance convenience against the intrusiveness of mobile advertising? How can mobile subscribers’ privacy be protected? What are the social costs that follow from the ever growing blurring of public–private boundaries? How can people better manage work–life balance and reduce stress in an environment where smartphones are always connected to the network? Indeed, research on smartphone use suggests that people turn off smartphones after working hours in order to increase productivity at work. Such questions have policies implications. Should mobile applications be required to use an opt-in versus opt-out approach, for example?

Additional research questions stem from the ongoing evolution of mobile industry structure and related mobile business models. The mobile ecosystem functions much like a networked enterprise, connecting many different players through a small number of dominant platforms. Android and iOS are the two largest of these ecosystems, bringing together content creators, application developers, network operators, device manufacturers, and operating system developers on a common platform. The role of network effects and critical mass pricing strategies, the benefits of open versus proprietary platforms, the ease of generating new services, platform governance and platform competition, represent just some of the important topics for study in this domain.

On a final note regarding mobile services, it is clear that much can be learned by examining the uptake of mobile communications in low- and middle-income countries, where services are being introduced into an environment that did not have an existing robust telephone and internet infrastructure. Substantial economic impacts have been observed due to having the ability to engage in voice calls over a distance, for example, allowing farmers or fishermen to call ahead to market traders to learn about prices. Because of the greater reliance on low-cost feature phones as the conduit for the introduction of services, however, these regions have also demonstrated remarkable innovative capacity that, in turn, is influencing strategies in the wealthy countries. Mobile payment systems such as M-PESA, market
information systems, buyer–seller platforms, farmer advisory and weather alerting systems, and disease and health monitoring via SMS, are just some of the examples of mobile phone based services that have been introduced in markets where most people have only simple feature phones. Examining how these services influence livelihoods and improve the prospects for economic development in the world’s poorest regions is a vibrant area of research.

Conclusion

Collectively, the entries in the Commercial Applications topic in the Encyclopedia illustrate how digitally mediated communication is permeating every aspect of commerce: All economies are thoroughly dependent now on all forms of digital media and communication to inform and reduce transaction costs, facilitate economic exchange, enable supply chain coordination, provide data for marketing, and improve customer service. The emergence of the many digital commerce applications creates new tensions between convenience and privacy, awareness and overload, access and piracy, to name but a few of the issues that arise in this area. In order to ensure that the benefits outweigh the potential dangers, research on emerging social and business practices must keep pace with ever changing technologies in order to better inform policies and practice. The entries for this topic offer a comprehensive introduction to the research that has been done and an agenda for where to take research on digitally mediated communication and commercial applications in the future.

SEE ALSO: B2B Electronic Markets; Data Mining and Marketing; Digitization of the Book Industry; e-Commerce Business Models; e-Commerce Online Payments; e-Commerce and Online Security; e-Commerce and Online Trust; e-Commerce Recommender Systems; e-Commerce Reputation Systems; e-Commerce Standards; e-Government; e-Health Services; Electronic Markets and Intermediation; Global e-Commerce and Trade; ICT4D and Mobile Communication; Internet Telephony; Location Based Commercial Services; Mobile Business Models; Mobile Commerce Applications; Mobile Communication Development; Mobile Lifestyles in the Business World; Online Advertising; Online Behavior and Marketing, Monitoring of; Online Business Collaboration; Online Consumer Behavior; Online Intermediaries and Supply Chains; Online Newspapers; Online Retailing; Peer to Peer Content

References


Charles Steinfield is a professor in the Department of Telecommunication, Information Studies, and Media at Michigan State University. He is a recipient of the university’s Distinguished Faculty and Teacher-Scholar Awards. He is author and editor of six books and over 100 articles. His research investigates how information technology has reshaped many areas of social and organizational life, including the impact of electronic commerce on consumers and businesses, the role of new media in supporting virtual team collaborations, the social capital benefits of online social networks, and the applications of new media to economic development aid in rural and developing regions.