

Matchmaking by Machine

A Socio-Technical and Socio-Cultural Perspective to Online Dating

Linda Siyuan Yang

MSc Management (2011/13)
Department of Management
London School of Economics and Political Science

KEYWORDS

Online Dating
ICT Innovation
Socio-Technical View
Socio-Cultural View
Techno-Economic View

ABSTRACT

This article uses online dating as an illustrative example of how digital business models transcend economic objectives to produce changes in societal behaviours and attitudes. Using a socio-technical perspective, this paper first examines how ICT innovations both shape and are shaped by their contexts. A socio-cultural lens is then applied to analyse the inherent power relations amongst ICT innovators, users, and the public at large as a result of ICT innovation. These two perspectives provide an alternative to the dominant technologically deterministic view that ICT innovations inevitably produce efficiencies and progress. The paper concludes that online dating, as a proxy for other digital businesses, was born because of certain technological and social developments. Through fulfilling its business goals, it also has the power to shape dating norms and recreate the dating pool – inequities and all – in a virtual world.

Introduction

Online dating, defined as “the practice of using dating sites to find a romantic partner” (Finkel et. al, 2012) is a booming digital business. In 2010, ICA, the digital media conglomerate that owns both Match.com and Chemistry.com, netted \$401 million in revenue from the two dating sites (Gelles, 2011). In April 2011, 25 million unique users logged on to an online dating site (Finkel et. al, 2012). Widening social acceptance, coupled with an increasingly time-crunched populace, indicates virtual match-making has more potential to grow. Given the central role of social relationships in our lives (Finkel et. al, 2012) and the proliferation of new technology, it is appropriate to investigate how this digital business model affects individuals and society.

This paper seeks to do that by using a socio-cultural and socio-technical lens of Information and Communications Technology (ICT) innovation to analyse online dating. The socio-cultural view is concerned with “who is inside and outside, who may speak, who may not, and who has authority and may be believed” when negotiating with technology (Marvin, 1988). Thus, the socio-cultural view highlights the dynamic power relations within ICT innovation. The socio-technical view argues technology must be situated within social and cultural contexts (Kling, 1999; 2000). That is, it should be recognized that technological changes both shape and are shaped by the offline world.

Corresponding Author
Email Address: S.Yang11@lse.ac.uk (L. S. Yang)

By using a socio-cultural and socio-technical view, we can analyse the power and effects of online dating beyond the economic and managerial sphere to paint a more holistic picture of how digital businesses produce more than profit. In particular, this paper examines the power of online dating sites to determine courtship rituals and create Marvin’s “inside and outside”. It also examines how their rise in popularity may change the social and cultural milieu of the physical world. This article concludes online dating both shapes and is shaped by the contexts in which it is situated. It was born because of certain technological and social developments. Through fulfilling its business goals, online dating has developed the power to shape dating norms and recreate the dating pool – inequities and all – in a virtual world.

This paper is structured as follows: First I present a literature review summarizing various topics of research within online dating and technology, along with the prevailing perspectives in the field. I then analyse the environment that fostered the rise of online dating, followed by the way it may shape relationships in the physical world. Then I examine the inherent power of online dating sites, which often arise from business decisions. Afterwards I consider which lessons can be generalized from online dating to other technologically-centred businesses to examine their influence on society. Lastly, I highlight limitations of my analysis and directions for future research.

Literature Review

ICT innovation has been an area of intense interest within the last 30 years as the spread of the computer, first in organisations and then in personal homes, brought rapid changes (Kling, 2000). ICT innovation attracts research from many disciplines such as information systems (Overby, Slaughter, & Konsynski, 2010) and communications (Walther, 1996).

Within online dating, a growing body of research has emerged encompassing technology, management, and sociology. Technologically, literature revolves around the use of Big Data, data mining techniques, and matching algorithms (Diaz, Metzler, & Amer-Yahia, 2010; Gelles, 2011). In the business realm, studies have examined how recommender systems can benefit both firms and customers (Ayres, 2007) and techniques for customer relations management (Smith, 2005). From a sociological standpoint, research has investigated the prevalence of deception in online dating (Lawson & Leck, 2006; Toma & Hancock, 2012), the conversion of information into “data tokens” reflecting society’s valuation of the calculable over the perceptible (Kallinikos & Tempini, 2012), and the ways in which online dating help and harm society (Finkel et. al, 2012).

Content aside, there have been two prevalent perspectives of technology within the research. One is a techno-economic view, in which technological innovation begets economic benefit. Technology is characterized as something that changes individual and institutional life, leading to the obsolescence of skills, the migration of workers, and individual adjustments in everyday activities (Freeman, 2007 qtd. in Mansell, 2012). This view is highly deterministic and clearly demonstrated in the 1970s and 80s, when Kling noted “questions about computerization were phrased as deterministic impact questions, such as ‘What will be the impact of computers on organization behaviour if we did X?’” (1999, p. 207). The techno-economic perspective is the prevailing view within technological research (Mansell, 2012). Through this lens, online dating is seen to improve the efficiency of marriage markets by increasing access to more actors and introducing a rational-choice element through algorithmic matching.

An alternative framework is the socio-cultural view. This perspective emphasises the actors, citizens, governments, and industries that negotiate how technology will be used (Marvin, 1988). It is useful to pair it with the socio-technical view, further elaborated upon in Kling’s field of social informatics. This asserts researchers should change from “viewing ICT as ‘having impacts’ to an appreciation that ‘the impacts’ of ICTs were socially shaped” (2000, p. 248). Together, these two perspectives provide a critical alternative to

the traditional view of technological determinism and uncover new insights about technological innovation. Viewed through the socio-cultural and socio-technical lens, the improved efficiency of finding romantic relationships through online dating is by no means inevitable. Indeed, its efficacy is largely dependent on the social context in which it operates, and – because ICT innovation is not neutral – it stands to affect that context both positively and negatively.

Therefore, it is possible to argue online dating sites are redefining individuals and institutions. Because of its prevalence, it is more important than ever to reveal its power and subsequent outcomes to better understand how this seemingly straightforward process may impact society.

How ICT Innovation is Shaped by Its Context

A socio-technical view of ICT is useful to examine which factors contributed to the rise of online dating. The analysis points to two key mechanisms: technological developments and changing social norms.

The genesis of online dating required the development of electronic media, most crucially the Internet. As early as 1985, Meyrowitz noted electronic media disassociated time and place so that an individual’s physical location no longer limited his or her social location. The advent of the Internet furthered this liberation. In the case of online dating, the Internet allowed sites to offer three “classes of services”: access, communication, and matching (Finkel et. al, 2012). First, the global reach of the Internet enabled individuals to meet more potential mates than before. Second, the nearly-instantaneous connections on the Internet through voice calls, messaging, and other channels allowed daters to connect regardless of their physical proximity. Last, thanks to the advent of Big Data (discussed below), romance no longer had to rely on intuition – matching-making could truly become a science (Finkel et. al, 2012). Taken together, the development of electronic media in general and the Internet in particular was a driving technical force in the birth of online dating.

The second technological advance was an improvement in gathering, storing, and analysing data. This was possible through better software, more sophisticated analysis techniques, and faster computing capabilities (McKinsey Global Institute, 2012). Because online dating depends on user-generated content not only through the information users provide on profiles, but also through their behaviours on the site (Gelles, 2011), the effective corraling of and insight generation from data enabled online dating to fulfil its promise of “matching”. This allowed dating to undergo process virtualization, or the transition from a physical process to an online

process (Overby, Slaughter, & Konsynski, 2010). Thanks to Big Data from online dating sites, romantic preferences were translated into “data tokens” which rendered finding partners online into “issues of information” (Kallinikos and Tempini, 2012, p. 16).

Besides technical developments, online dating grew out of changing social norms. The proliferation of process virtualization in many sectors including education, medicine, and the government (Overby, Slaughter, & Konsynski, 2010) reflects a cultural shift in society’s estimation of the sensible, or what can be gained from sensory experience, and the intelligible, or what can be thought without “immediate access to tangible reality” (Kallinikos & Tempini, 2012, p. 4). Kallinikos and Tempini assert the latter is gaining prominence in modern society citing, among other pieces of evidence, articles from *Wired* magazine extolling how data will help address societal issues in healthcare and agriculture (2012). The prevailing social view that data can solve our problems (Ayres, 2007, in Kallinikos & Tempini, 2012) boosted the appeal of online dating as users believed matching algorithms were superior to human intuition in the case of mate selection.

Two other social changes helped popularize online dating. First, meeting partners online became less stigmatized. Popular media, with movies like *You’ve Got Mail* and success stories of online daters (e.g. Egan, 2003; Gelles, 2011), changed the perception online dating was only for the socially inept or undesirable (Finkel et. al, 2012). It became mainstream, with some (albeit biased) estimates asserting “1 in 5 relationships start online” (Match.com, qtd. in Finkel et. al, 2012, p. 12).

Second, there was a shift in dating and mating patterns. Studies show attitudes towards online dating become more positive as users’ immediate environments offer fewer and fewer suitable partners (Finkel et. al, 2012). In 2009, the average UK woman married at the age of 30 (Wallop, 2011). Thus, it stands to reason more and more individuals left the traditional dating arenas (i.e. university) which limited their access to appropriate partners. Coupled with a more hectic work-life balance, modern daters needed a quick way to access many eligible partners in a manner that fit their schedules. Online dating, with its ability to free individuals from time and space, fit the bill.

To summarize, the development of the Internet and the improved handling of data were key technological advances that enabled the rise of online dating. At the same time, changing social norms – namely, the privileging of the intelligible over the sensible, positive depictions of online dating in mainstream media, and changes in dating and mating habits – increased demand for and acceptance of online dating.

How ICT Innovation Shapes its Context

Not only does the environment engender the rise of online dating – the phenomenon also has real potential to shape behaviours and attitudes in offline contexts. In the interest of space, here I will only focus on three potential effects. First, Finkel et. al have identified online daters – faced with an infinite amount of profiles – may adopt an “assessment mindset, in which people rapidly evaluate another person’s potential as a romantic partner...and may promote the tendency to commoditize other people” (2012, p. 50). This could lead to shallow interpersonal connections rather than the communal orientation necessary in successful relationships (Finkel et. al, 2012). This is problematic because online relationship formation may have a more transactional focus: daters do not see individuals so much as they see profiles that can be quickly interchanged with another. In offline dating, this may induce people to view potential mates as dispensable, leading them to prematurely discard good matches.

Second, online dating sites promote a “soulmate belief”, reinforcing the idea users must find “The One” to have a successful relationship. eHarmony features “Tips for Finding Your Soulmate Online” and PlentyofFish urges users to “Signup now and find your soulmate!!” (Finkel et. al, 2012, p. 50). This could actually increase the number of break-ups on- and offline as research has found those with a “soulmate belief” are more likely to leave a relationship with times get rough. On the other hand, those with a “work-it-out” belief recognize all couples face challenges; perseverance and work are required to achieve a happy relationship (Finkel et. al, 2012). Thus, promoting a “soulmate belief” is a marketing decision that has the potential to change the social milieu: spreading it may harm offline relationships as it encourages individuals to leave an imperfect (but fulfilling) relationship. In a world where the divorce rate is as high as 50% in the US, any perspective that urges more breakups may be a major threat to public happiness (Marriage and Divorce, 2012).

Last, the spread of online dating and reliance on data, algorithms, and recommender systems will continue the debate around whether machines can and should replace humans in some aspects of our lives. There are already a range of views: some believe humans will always have an advantage in work that involves intuition, creativity, and uncertainty (Brynjolfsson & McAfee, 2012). Others predict “PC human surrogate machines” with advanced artificial intelligence that gives them “sufficient thinking, feeling, and acting capacity to mimic...an average human” (Mahfouz et. al, 2008, p. 3024).

This important debate will only intensify as more anecdotal and empirical evidence emerges from

online dating. Indeed, research shows matching algorithms may not predict relationship duration or quality at all. A 2011 study found no significant correlation between users’ judgments of their dates before and after their first face-to-face meeting with a potential partner. In contrast, judgments made after a first meeting significantly correlated with relationship duration (Fiore et. al., 2011). This shows meeting in person and relying on human intuition may be more important in dating. This is supported by another study by Frost and colleagues which classified humans as the ultimate “experiential good”, or products that “are judged by the feelings they evoke, rather than the functions they perform,” such as films or restaurant meals (2008, p. 52). Without actually experiencing their would-be partner, users were frequently disappointed when meeting their online match face-to-face for the first time. This strengthens the argument that computer-mediated systems may not be the entire solution to finding romance.

Power and Those “Inside and Outside” in ICT Innovation

Shifting from a socio-technical view of ICT innovation to a socio-cultural perspective, this section investigates power within online dating. The question of who has it, in this case, points to the keepers of online dating sites. On the outside, these designers and programmers seem like benign brokers. However, a closer look reveals how their business decisions create instances of power assertion.

For example, digital business models must tackle the question of how to generate revenue. An online dating site must consider this process extremely carefully as it has two conflicting goals: to make matches and retain traffic (Fiore & Donath, 2004). When deciding how to keep their subscribers, dating sites exert power over their users. For instance, Match.com relies on two mechanisms – the human capacity to fantasize and a prescribed communication method between daters. Its profile search engine, coupled with Venus alerts (notifications that highlight profiles most compatible with the dater’s own), constantly reveal potential mates about whom to fantasize. The endless stream of new material keeps users engaged in the site (Arvidsson, 2006).

Furthermore, Match.com recommends taking time to get to know potential partners. It advises against interacting with users who want to meet face-to-face after one exchange of communications. The site suggests users wait to share personal or contact information until they feel comfortable. These “slow-and-steady” messages ostensibly promote safety for daters. However, this approach also maintains consistency with Match.com’s brand and purpose (to provide “Quality Singles”) and helps the site retain a subscribed member. By following these

recommendations, users prolong their fantasizing process (Arvidsson, 2006).

These examples demonstrate how dating sites regulate the process of searching for and communicating with potential partners. Therefore, it must be recognized they exercise power by defining courtship rituals. While it could be argued the slow-and-steady method is a reflection of “real world” dating processes, we should not overlook the fact online dating sites pass value judgments. These judgments often arise because of business objectives. For instance, Match.com monitors and removes profiles that do not fit the “Quality Single” ideal through their “Quality Assurance Team”. By reviewing each profile to filter out questionable users, the team maintains the brand image. By checking for “any direct contact” between would-be daters, they maintain their monopoly on communication, which helps retain subscribers (Arvidsson, 2006: 684). These examples are indicative of how business decisions dictate the implicit ways dating sites create prescriptive courtship rituals and norms. This places the power in the hands of dating site designers as users can only find their matches if they adhere to “the rules”.

Online dating sites also empower site designers through forcing them to target a specific market. This places people firmly “inside and outside” of Marvin’s socio-cultural view of technology (1988). In their qualitative research of online dating sites, Churchill and Goodman interviewed 22 online daters on aspects of self-presentation, among other topics. One interviewee, a self-professed dominatrix, lamented the inability to speak about sex on mainstream sites and pointed out drop-down menus with adjectives to describe herself made her feel “invisible” because “there is no category for me” (2008, p. 94).

While consumer segmentation – which by definition leads to groups of inclusion and exclusion – is used in every business, its effect in online dating is ironic. This is because one touted benefit of these sites is to make dating more accessible to everyone, including those who may struggle to find partners in the physical world. However, active filtering and designer and user norms mean those who need the most help finding a mate may also be the ones who are left out (Finkel et. al, 2012). While there are niche sites for specific purposes (e.g. sexually explicit Adult Friend Finder) and demographics (e.g. DatingforParents.com), mainstream dating sites mostly cater for single heterosexual daters seeking lifelong partners. Thus, the online dating scene mimics the one offline with a mainstream population and more marginalized groups. Again, this demonstrates online dating may not fully deliver the social benefits it is purported to do.

Applicability of Online Dating to Other Digital Business Models

After examining its power to reflect and shape societal norms, influence offline relationships, and reinforce the mainstream and the marginalized, it is worth asking whether other digital business models can learn from the characteristics and consequences of online dating. One major lesson is that business decisions have powerful outcomes – intended or otherwise – from a sociological standpoint. In marketing, whom digital businesses target may either ameliorate or exacerbate existing inequities in society. Furthermore, marketing communications (such as the promotion of a soulmate belief) could create new values or challenge existing ones, leading to unexpected consequences. In designing their business processes, firms may well be defining or redefining cultural norms. The implications of this re-rendering should not be ignored if we are to have a full understanding of how digital business impacts all facets of our world, not just the technological or the economic.

Limitations and Future Research

This paper has contributed to the understanding of online dating and digital business models by presenting an alternative view to ICT innovation. However, it has three main limitations. First, it does not delve into the technical aspects of recommender systems and algorithms. This allowed the paper to maintain its social and cultural level of analysis without getting mired in mathematical detail. However, it would be fruitful to examine the hidden biases of algorithms. This would deepen our understanding of technical sources of power in online dating.

Second, my conception of the consequences online dating may have on “offline relationships” solely considered relationships in Western society. This cultural focus may be warranted as internet usage is highest in the US at 78% (Finkel et. al, 2012) and many popular online dating sites are dominated by Western users. Indeed, Match.com claims seven million of its nine million users are in the US (Arvidsson, 2006). However, online dating is a worldwide phenomenon. Thus, further areas of study could include how online dating impacts physical relationships in non-Western countries, or cross-cultural comparisons of any observed behavioural changes. In particular, it would be interesting to examine cultures that already have a strong match-making tradition.

Last, future research may take a more philosophical approach to contextualize online dating in the larger sweep of posthumanist life. Although I touched upon the debate of whether humans can be replaced or supplemented by machines, space did not permit

me to discuss this in detail. This line of research could explore whether mainstream acceptance of online dating is a harbinger for more technologically enabled processes that blur the line between man and machine.

Conclusion

This paper presented a socio-technical and socio-cultural view of online dating. Specifically, it focused on how online dating is shaped by and shapes the context in which it is situated. It also analysed the power of online dating sites to reflect and redefine courtship norms and rituals, and to recreate social inequities from the physical world in the virtual world. Online dating sites exercise power in many ways, often in order to fulfil business needs. These needs include maintaining revenue streams and cultivating a brand image. This indicates digital business models and their related management decisions transcend the economic and managerial spheres to have wide-reaching influence on social psychology, sociology, and philosophical thought. If researchers keep in mind the interconnectedness of these fields, future studies can paint a more holistic picture of the impact of digital business.

References

- Arvidsson, A. (2006) Quality Singles: Internet Dating and the Work of Fantasy. *New Media and Society*, 8(4): 671-690.
- Ayres, I. (2007) Ch. 1: Who's Doing Your Thinking For You? *Super Crunchers*. New York: Bantam Dell.
- Brynjolfsson, E. and McAfee, A. (2012) Winning the Race with Ever-Smarter Machines. *MIT Sloan Management Review*, 53(2): 53-60.
- Churchill, E. F. and Goodman, E. S. (2008) *(In)visible Partners: People, Algorithms, and Business Models in Online Dating*. Conference Proceedings from the Ethnographic Praxis in Industry Conference.
- Diaz, F., Metzler, D. and Amer-Yahia, S. (2010) *Relevance and Ranking in Online Dating Systems*. Conference proceedings from the Special Interest Group on Information Retrieval Conference. Geneva: Switzerland.
- Egan, J. (2003) Love in the Time of No Time. *The New York Times Magazine*. Retrieved from: <http://www.nytimes.com/2003/11/23/magazine/love-in-the-time-of-no-time.html?pagewanted=all&src=pm>, accessed 16th March 2013.
- Finkel, E., Eastwick, P.W., Karney, B.R., Reis, H.T. and Sprecher, S. (2012) Online Dating: A Critical Analysis From the Perspective of Psychological Science. *Psychological Science in the Public Interest*, 13(1): 3-66.
- Fiore, A. and Donath, J. (2004) *Online Personals: An Overview*. Conference Proceedings from the 2004 Extended Abstracts on Human Factors in Computing Systems, 1395-1398.
- Fiore, A., Taylor, L., Mendelsohn, G. and Cheshire, C. (2011) *Predicting Relationship Outcomes in Online Dating: A Longitudinal Survey*. Conference Proceedings from the 2011 iConference.

Frost, J.H., Chance, Z., Norton, M.I. and Ariely, D. (2008) People are Experience Goods: Improving Online Dating with Virtual Dates. *Journal of Interactive Marketing*, 22(1): 51-61.

Gelles, D. (2011) Inside Match.com. *Financial Times*. Retrieved from: <http://www.ft.com/intl/cms/s/2/f31cae04-b8ca-11e0-8206-00144feabd0.html#axzz2FVpba6gP>, accessed 16th March 2013.

Kallinikos, J. and Tempini, N. (2012) *Post-Material Mediations: On Data Tokens, Knowledge and Behaviour*. Conference Proceedings at EGOS.

Kling, R. (1999) What is Social Informatics and Why Does It Matter? *The Information Society*, 23: 205-220.

Kling, R. (2000) Social Informatics: A New Perspective on Social Research about Information and Communication Technologies. *Critical Studies in Innovation*, 18(3): 245-264.

Lawson, H.M. and Leck, K. (2006) Dynamics of Internet Dating. *Social Science Computer Review*, 24(2):189-208.

Mahfouz, A. Y., Philaretou, A.G. and Theocharous, A. (2008) Virtual Social Interactions: Evolutionary, Social Psychological, and Technological Perspectives. *Computers in Human Behaviour*, 24: 3014-3026.

Marvin, C. (1988) *When Old Technologies Were New: Thinking About Communication in the Late Nineteenth Century*. New York: Oxford University Press.

Mansell, R. (2012) *Social Imaginaries of Communication Technologies* [PDF document]. Retrieved from: https://moodle.lse.ac.uk/pluginfile.php/380736/mod_resource/content/3/MC%20408%20Week%206%202012v2.pdf, accessed 18th March 2013.

Marriage and Divorce. (2012) *Centres for Disease Control and Prevention*. Retrieved from: <http://www.cdc.gov/nchs/fastats/divorce.htm>, accessed 11th March 2013.

McKinsey Global Institute. (2012) *Big Data: The Next Frontier for Innovation, Competition, and Productivity*. Retrieved from http://www.mckinsey.com/insights/business_technology/big_data_the_next_frontier_for_innovation, accessed 18th March 2013.

Meyrowitz, J. (1985) *No Sense of Place*. New York: Oxford University Press.

Overby, E., Slaughter, S.A. and Konsynski, B. (2010) The Design, Use, and Consequences of Virtual Processes. *Information Systems Research*, 21(4): 700-710.

Smith, A.D. (2005) Exploring Online Dating and Customer Relationship Management. *Online Information Review* 22(1): 18-33.

Toma, C. L. and Hancock, J.T. (2012) What Lies Beneath: The Linguistic Traces of Deception in Online Dating. *Journal of Communication*, 62(1): 78-97.

Wallop, H. (2011) Average Age for Women to Marry Hits 30 for First Time. *The Telegraph*. Retrieved from: <http://www.telegraph.co.uk/news/8415852/Average-age-for-women-to-marry-hits-30-for-first-time.html>, accessed 9th March 2013.

Walther, J.B. (1996) Computer-Mediated Communication: Impersonal, Interpersonal, and Hyperpersonal Interaction. *Communications Research*, 23(1): 3-43.