



The Adoption of Web 2.0 Platforms

Nikhil Srinivasan, Jan Damsgaard

► To cite this version:

Nikhil Srinivasan, Jan Damsgaard. The Adoption of Web 2.0 Platforms. Governance and Sustainability in Information Systems: Managing the Transfer and Diffusion of IT (Working conference), Sep 2011, Hamburg, Germany. pp.364-370, 10.1007/978-3-642-24148-2_30 . hal-01571736

HAL Id: hal-01571736

<https://inria.hal.science/hal-01571736>

Submitted on 3 Aug 2017

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Distributed under a Creative Commons Attribution 4.0 International License

The Adoption of Web 2.0 platforms

Nikhil Srinivasan

Department of Information Technology Management, Howitzvej 60, Frederiksberg,
Copenhagen, DK 2000
+45 (21603788)
Ns.caict@cbs.dk

Jan Damsgaard

Department of Information Technology Management, Howitzvej 60, Frederiksberg,
Copenhagen, DK 2000
+45 (24794309)
Jd.caict@cbs.dk

Abstract. In this paper we study the adoption of Web 2.0 platforms. Existing theoretical approaches to understand the adoption of IT are critically re-examined for their applicability in the Web 2.0 domain. We find that the two basic assumptions of traditional approaches 1) the unit of analysis is a person and 2) the technology's primary utility is personal, does not hold for Web 2.0 platforms. Instead, we argue, the appropriate unit of adoption is the social network and the utility stems mainly from collective use.

Keywords: web 2.0, adoption, social network, diffusion.

1 INTRODUCTION

Web 2.0 platforms have in very short time integrated into people's lives both socially and professionally. A Web 2.0 platform is loosely defined as an aggregation of technologies such as blogs, wiki's, mash-ups, social bookmarking sites, and others that are build around social relations that individuals establish or confirms with each other for the purpose of communication, collaboration and coordination of information, knowledge and activities (O'Reilly 2005). A web 2.0 platform is inherently a participative environment where the consumers of information and knowledge are simultaneously the co-creators and consumers of information and knowledge (Parameswaran et al. 2007).

Web 2.0 has attracted the attention of researchers, practitioners and organizations alike. One reason is that the estimated value of a platform, for example Facebook is worth \$11.5 Billion according to Bloomberg Business Week (March 3, 2010 edition) and the revenue made on ads is enormous, so the value of predicting and understanding which platform succeeds and why is substantial. However before we

are overwhelmed by the success of a few platforms we must remember that most Web 2.0 platforms never gain much attention and become abandoned after the first colonists realize that too few are following to make the platform viable. Most settlers therefore move on leaving behind a “ghost town” platform of forgotten passwords, profiles that are never updated, and connection requests that are never granted.

Academic studies have examined the adoption of specific Web 2.0 technologies (Hester 2008) and employed popular and widely acknowledged models such as Diffusion of Innovation (DOI) (Rogers 1995), Technology Acceptance (TAM) or Unified Theory of Acceptance and Use of Technology (UTAUT) (Davis et al. 1989; Venkatesh et al. 2003) that have proven themselves in the past. However many extend DOI and TAM to cover Web 2.0 platforms without revisiting the basic assumptions of the models and their acclaimed validity domain (Sledgianowski et al. 2009). One profound difference is that Web 2.0 platforms only have value when many are using them, which is not paramount for many previous IT applications that were perfectly useful for an individual alone e.g. word processing. This weighty difference is often neglected. Therefore Web 2.0 represents a paradigm shift in IT and as such traditional models of adoption and diffusion may not readily apply. The central point of departure is thus the following research question.

How to understand the adoption of Web 2.0 platforms?

The remainder of this paper is organized the following way. In the next section we describe Web 2.0 platforms and review the classical diffusion literature and pinpoint some of the limitations of an extension of their validity domain. In the third section we propose the social network lens as a better explanatory vehicle for understanding and predicting the adoption and diffusion of Web 2.0 platforms. Finally we make some conclusions and discuss the potential implications of our work.

2 THE NATURE OF WEB 2.0 PLATFORMS

In this section we first summarize and discuss the literature surrounding web 2.0 platforms and we then review the literature in adoption and diffusion literature.

2.1 Web 2.0 platforms

Web 2.0 platforms refer to technological and social infrastructures that are used to support specific and generalized modes of communication and collaboration between distributed individuals that share a common interest. Web 2.0 platforms are often referred to as social media platforms. Social media have been described as having the unique feature of “active creation of content by their users or members”(Scott et al. 200, O'Reilly 2005) where the creation of content takes place through the building and maintaining of social relations. Technologies such as wikis, blogs, podcasts, folksonomies, mash-ups, social networks, virtual-worlds and crowd-sourcing are also referred to as web 2.0 technologies (Andriole 2010).

2.2 Revisiting classical adoption and diffusion theory

The diffusion and adoption of technologies have been examined from two broad perspectives. The first perspective focuses on the personal adoption of a technology. The second perspective focuses on the spread of a technology among a group of people.

The individual adoption of a technology is based on two broad theories from social psychology i.e. the theory of reasoned action (Fishbein et al. 1975) and the theory of planned behavior (Ajzen 1985). The first work by Davis, Bagozzi and others (1989; 1989) was referred to as the technology acceptance model (TAM). TAM has been applied across cultures (Straub et al. 1997), gender (Gefen et al. 1997), extended with social influence (Malhotra et al. 2002), accounted for task-technology fit (Dishaw et al. 1999), and other extensions. A comprehensive review performed by Venkatesh et al. (2003) compared 8 different user acceptance models and synthesized them into a comprehensive model referred to as the Unified Theory of Acceptance and Use of Technology (UTAUT). Since an extensive review of the theory is beyond the scope of the paper please refer to Venkatesh (Venkatesh et al. 2007; Venkatesh et al. 2003) and the special issue of JAIS for a more extensive literature review. Broadly speaking within the individual technology acceptance literature characteristics such as habit, self-efficacy, experience, task relevance, and others are primary and important determinants of behavior regarding individual technology adoption and use (Davis et al. 1989; Venkatesh et al. 2003).

The second perspective on the spread technology exists at a broader level and examines the factors that contribute to and the manner in which technologies diffuse across a population of potential adopters similar to the spread of a virus. Rogers (1995) named adopter categories that characterize the nature of the adopters along a Sigmoid curve of innovation adoption and places them in four categories; innovators, early majority, late majority and laggards. Since the work of Rogers, DOI theory has been extensively applied in IS (Attewell 1991; Moore et al. 1991; Mustonen-Ollila et al. 2003). However despite its extensive application and popularity, DOI has also received some criticism (Lyytinen et al. 2001; Lyytinen et al. 2011) noting that DOI may not be sophisticated enough to address complex IT. DOI theory is especially effective at examining singular, monolithic technologies or well-defined systems with a apparent function such as TV sets or coffee makers (Lyytinen et al. 2001). Such technologies typically rely on economies of scale on the supply side and the use of the system on the demand side is fairly independent of others use of the same technology. For instance, the use of a coffee maker is pretty straight forward and your usage is fairly independent of other individuals' use of coffee makers. Furthermore, mass production on the supply side drives prices down leading to wider diffusion. As such, DOI theory is successful in examining the diffusion of simple technologies as an aggregated phenomenon across a population of would be adopters.

2.3 Revisiting the assumptions of TAM and DOI

In the TAM and DOI approach to the adoption of innovations and technologies, individual characteristics are the primary determinant of individual adoption and use behavior. In examining the adopter population, individuals are treated as relatively isolated from the group thereby separating them from the social setting in which they are embedded. By treating individuals as independent in their adoption behavior, the TAM and DOI perspectives do not focus on the interplay between users and between user behaviors (Benbasat et al. 2007). Furthermore, TAM and associated theories of adoption do not explain why parts of the population are more likely to adopt the technology or service and the other parts of the population less so despite sharing similar individual characteristics (Lyytinen et al. 2011). While they do a good job of explaining why specific individuals adopt technologies and services, they do a relatively poor job of understanding and explaining why others do not adopt the technology or service despite being similar and belonging to the same pool of potential adopters (Lyytinen et al. 2011).

2.4 Differentiating Web 2.0 Platforms

Web 2.0 platforms as infrastructures bind social networks together through which existing and new social relations are established and maintained. Due to network effects inherent in web 2.0 platforms the social relationships and transactions are not mobile and individuals are relegated to adoption of web 2.0 platform based on similar adoptions by members of his or her social network. Consequently, the adoption of a web 2.0 platform by an individual is subordinated to the adoption of web 2.0 platforms by the social network. The superior predictor of the use of web 2.0 platforms by an individual is consequently the social network that a specific person belongs to and not some personal traits or fit with a specific platform as DOI and TAM models would assume.

Individuals may probe web 2.0 platforms in search of the most appropriate one but the social network can only adopt a single web 2.0 platform due to the network externalities associated with it. We therefore need to shift the unit of analysis from the singular person to the social network. The individual user may prefer a different platform but adoption would lead to online social exclusion and therefore the individual is obliged to adopt the same platform as the social network regardless of personal preferences and past experiences (analogously a goose may prefer to fly a different way but will lose its flock if it does so). Behavior in such platforms is not coordinated but rather based on informal rules and spontaneity that govern interactions and is similar to social norms. Similarly behavior and knowledge in web 2.0 platforms is conditional on the use of the system by others.

3 INSIGHTS FROM SOCIAL NETWORK RESEARCH

Social network literature highlights the role of friends, family and coworkers in driving the adoption and the diffusion of technologies and services (Siam et al. 2008;

Sykes et al. 2009; Vannoy et al. 2010; Vilpponen et al. 2006). Furthermore, it also highlights the manner in which the embeddedness of individuals in networks increases the likeliness of adoption. To do this it relies on characteristics, relationships between individuals, and the structure of the social network that people are embedded in. Individuals replicate their real-world social relationships in web 2.0 platforms (Wellman et al. 1996). However web 2.0 based social networks are often incompatible with each other as they both increase the visibility of social networks and makes the communication boundaries between them transparent.

As we have characterized adoption and diffusion process of social media services as a network phenomenon, we are agnostic about the boundaries of the network. Social networks on web 2.0 platforms are exceptionally large and the ease of forming and maintaining relationships makes a clear demarcation of network boundaries conceptually and practically impossible. As such, in the context of web 2.0 platforms, social media services and social networks, it is important to examine both a specific social network and the global network of social networks. Social networks are important in social media service since they are likely the first and major sources of influence in adoption decisions. Global networks of social networks unlike single social networks focus on all the relationships that might exist between all the social networks in a specific demarcated system that exist on a specific Web 2.0 platform. For instance, a social network around fridge door magnet collectors on Facebook would be a specific social network while the global network would be the all the social networks existing on Facebook and all the relationships between the active social networks. The local configuration of relationships and the social network's adoption of technology represents a "we-intention" (Bagozzi 2007) on part of the social network. The local configuration of relationships can be described in a variety of ways ranging from traditional social network analytic measures to more generalized measures of social structure.

4 CONCLUSIONS

In this research-in-progress we examined social networks' adoption of Web 2.0 platforms. The social network is an emergent entity of many individuals and their relations, yet it cannot be reduced to its constituent parts. Individualistic model that focus on adoption of such services by the individual user are less suitable for such analysis since they ignore the emergent properties of the social network and privilege the "parts" instead of the "whole". A social network perspective drives us to examining groups of related individuals in examining adoption web 2.0 platforms. The social network lens drives us towards examining relations and relational structures that comprise groups and social networks. The primary question that emerges from the use of the network lens is; how do social network characteristics influence adoption of web 2.0 platforms? While previous research may have examined web 2.0 and social media service adoption through the individualistic lens, they have included certain social network components in their analysis. Our question privileges the social network perspective above the individual and consequently the

social network characteristics are not merely mediators or moderators but rather the independent determinant in adoption of web 2.0 platforms.

This approach accommodates the puzzling fact that many people adopt several Web 2.0 platforms even though this is both ineffective and troublesome. An apparent anomaly that cannot be explained by the classical diffusion and adoption models but our approach provides a plausible explanation. Namely that the adopting unit for Web 2.0 platforms is the social network and since a person naturally belongs to multiple platforms she will have to adopt several platforms – in principle one for each social network that she feels part of and wishes to contribute to. Consequently a person may very well adopt several Web 2.0 platforms.

REFERENCES

- Adler, P.S., and Kwon, S.-W. "Social Capital: Prospects for a New Concept," *Academy of Management Review* (27:1), January 2002, pp 17-40.
- Ajzen, I. "From intentions to actions: A theory of planned behavior," *Action-control: From cognition to behavior* (11) 1985, p 39.
- Andersen, P.B., Emmeche, C., and Finnemann, N.O. *Downward Causation: Minds, bodies and matter* Aarhus University Press, 2000.
- Andriole, S.J. "Business Impact of Web 2.0 Technologies," *Communications of the ACM* (53:12) 2010, pp 67-79.
- Attewell, P. "Technology diffusion and organizational learning: The case of business computing," *Organization Science* (3:1), February 1991, pp 1-19.
- Benbasat, I., and Barki, H. "Quo vadis, TAM," *Journal of the Association for Information Systems* (8:4) 2007, pp 211-218.
- Bovasso, G. "A Network Analysis of Social Contagion Processes in an Organizational Intervention," *Human Relations* (49:11) 1996, p 1419.
- Burt, R.S. "The Contingent Value of Social Capital," *Administrative Science Quarterly* (42:2), June 1997, pp 339-365.
- Burt, R.S. "Structural Holes versus Network Closure as Social Capital," in: *Social Capital: Theory and Research*, N. Lin, K.S. Cook, R.S. Burt and A.d. Gruyter (eds.), 2000, p. 1.
- Buskens, V., and Yamaguchi, K. "A New Model for Information Diffusion in Heterogeneous Social Networks," *Sociological Methodology* (29) 1999, pp 281-325.
- Chi, F., and Yang, N. "Twitter Adoption in Congress," *Social Science Research Network* 2010.
- Coleman, J.S. "Social Capital in the Creation of Human Capital," *The American Journal of Sociology* (94) 1988, pp S95-S120.
- Davis, F.D. "Perceived usefulness, perceived ease of use, and user acceptance of information technology," *MIS Quarterly* (13:3) 1989, pp 319-340.
- Davis, F.D., Bagozzi, R.P., and Warshaw, P.R. "User acceptance of computer technology: A comparison of two theoretical models," *Management Science* (35:8) 1989, pp 982-1003.
- Dishaw, M.T., and Strong, D.M. "Extending the technology acceptance model with task-technology fit constructs," *Information & Management* (36:1) 1999, pp 9-21.
- Fishbein, M., and Ajzen, I. *Belief, attitude, intention, and behavior: An introduction to theory and research* Addison-Wesley, Reading, MA, 1975.
- Galaskiewicz, J., and Burt, R. "Interorganization Contagion in Corporate Philanthropy," *Administrative Science Quarterly* (36:1) 1991.
- Gefen, D., and Straub, D.W. "Gender differences in the perception and use of e-mail: An extension to the technology acceptance model," *MIS Quarterly* (21:4) 1997, pp 389-400.

- Granovetter, M.S. "The Strength of Weak Ties," *The American Journal of Sociology* (78:6), May 1973, pp 1360-1380.
- Hester, A. "Innovating with organizational wikis: factors facilitating adoption and diffusion of an effective collaborative knowledge management system," *ACM*, 2008, pp. 161-163.
- Lyytinen, K., and Damsgaard, J. "What's wrong with the diffusion of innovation theory?," *Diffusing Software Products and Process Innovations* 2001, pp 173-190.
- Lyytinen, K., and Damsgaard, J. "Inter-organizational information systems adoption - a configuration analysis approach," *European Journal of Information Systems* (18:1) 2011.
- Malhotra, Y., and Galletta, D.F. "Extending the technology acceptance model to account for social influence: theoretical bases and empirical validation," *IEEE*, 2002, p. 14.
- Moore, G.C., and Benhasat, I. "Development of an instrument to measure the perceptions of adopting an information technology innovation," *Information Systems Research* (2:3), September 1991, pp 192-221.
- Mustonen-Ollila, E., and Lyytinen, K. "Why organizations adopt information system process innovations: a longitudinal study using Diffusion of Innovation theory," *Information Systems Journal* (13:3) 2003, pp 275-297.
- O'Reilly, T. "What is web 2.0," *Design patterns and business models for the next generation of software* (30) 2005, p 2005.
- Parameswaran, M., and Whinston, A.B. "Research issues in social computing," *Journal of the Association for Information Systems* (8:6) 2007, pp 336-350.
- Rogers, E.M. *Diffusion of innovations* Free Pr, 1995.
- Scott, S.V., and Orlikowski, W.J. "Getting the truth: exploring the material grounds of institutional dynamics in social media," 2009.
- Siam, A., and Esfahanipour, A. "Effect Of Network Relations On The Adoption Of Electronic Trading Systems," *Journal of Management Information Systems* (25:1) 2008.
- Singh, J. "Collaborative networks as determinants of knowledge diffusion patterns," *Management Science* (51:5) 2005, pp 756-770.
- Sledgianowski, D., and Kulviwat, S. "USING SOCIAL NETWORK SITES: THE EFFECTS OF PLAYFULNESS, CRITICAL MASS AND TRUST IN A HEDONIC CONTEXT," *Journal of Computer Information Systems* (49:4), Summer2009 2009, pp 74-83.
- Straub, D., Keil, M., and Brenner, W. "Testing the technology acceptance model across cultures: A three country study," *Information & Management* (33:1) 1997, pp 1-11.
- Sykes, T.A., Venkatesh, V., and Gosain, S. "Model of Acceptance with Peer Support: A Social Network Perspective to Understand Employees' System Use," *MIS Quarterly* (33:2) 2009, pp 371-393.
- Vannoy, S.A., and Palvia, P. "The social influence model of technology adoption," *Communications of the ACM* (53:6) 2010, pp 149-153.
- Venkatesh, V., Davis, F.D., and Morris, M.G. "Dead or alive? The development, trajectory and future of technology adoption research," *Journal of the Association for Information Systems* (8:4) 2007, pp 267-286.
- Venkatesh, V., Morris, M.G., Davis, G.B., Davis, F.D., DeLone, W.H., McLean, E.R., Jarvis, C.B., MacKenzie, S.B., Podsakoff, P.M., and Chin, W.W. "User acceptance of information technology: Toward a unified view," *INFORM MANAGEMENT* (27:3) 2003, pp 425-478.
- Vilpponen, A., Winter, S., and Sundqvist, S. "Electronic Word-of-Mouth in Online Environments: Exploring Referral Network Structure and Adoption Behavior," *Journal of Interactive Advertising* (6:2) 2006, pp 71-86.

AUTHOR BIOGRAPHIES

Nikhil Srinivasan is a Post-doc at the Department of Information Technology Management at the Copenhagen Business School. His research takes place in the context of the dynamic and ever-evolving nature of human interaction in technology mediated environments. Specific interests in this domain include social network structures in knowledge communities and social media platforms and their effects on performance, and the role of networks in diffusion information and innovations. He can be reached at ns.caict@cbs.dk or at <http://nsrinivasan.net>

Professor Jan Damsgaard (JD) is the head of the department of IT management, Copenhagen Business School, Denmark. He holds a Ph.D. in Information Systems and a Master's degree in Computer Science and Psychology. His research focuses on the diffusion and implementation of networked technologies such as e-business, intranet, social media, and mobile services. Common for networked technologies is that they only become valuable through massive adoption. In much of his work JD combines business and technological perspectives. JD has worked and done research at numerous foreign institutions in the USA, China, Finland and Australia. JD can be reached at damsgaard@cbs.dk or at <http://www.cbs.dk/staff/damsgaard/>