

6-26-2018

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Recommended Citation

Jahanbin, Pouyan and Wingreen, Stephen, "The Effect of the Social Media Tools on Virtual Team Performance: The Mediating Role of Transactive Memory System Mapping with the Feature Richness" (2018). *PACIS 2018 Proceedings*. 329.
<https://aisel.aisnet.org/pacis2018/329>

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The Effect of the Social Media Tools on Virtual Team Performance

The Mediating Role of Transactive Memory System Mapping with the Feature Richness

Submission Type: Research-in-Progress

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Abstract

The communication tool is an important component of a virtual team, and virtual teams are highly dependent upon the communication tools for accomplishing their tasks and fulfilling their needs effectively. This research in progress builds upon the existing literature and employs the concept of feature richness of social media tools and a Transactive Memory System (TMS) approach to develop a conceptual framework for understanding the impact of social media tools on virtual team performance. Thus, a conceptual research model which postulates that TMS mediates the relationship between social media tools and virtual team performance, is developed. This research tries to establish an appropriate component-level mapping between the components of TMS construct and the feature richness factors to provide a deeper understanding about the effect of social media tools on TMS and consequently, the impact on virtual team performance.

Keywords: Virtual Team, Transactive Memory System, Feature Richness, Social Media.

Introduction

Virtual team is one of the most state-of-the-art organizations' remedies for tackling challenges of ever-changing environment and increasing decentralization and globalization of work processes (Hertel et al., 2005). Organizations believe that Virtual team is a modern phenomenon all over the globe (Horwitz, Bravington, and Silvis, 2006), and in many of them, they have been turned into the inevitable part of daily work routines. In order to perform cooperative tasks, virtual teams work in geographically separated locations with distinct time zones; virtual teams usually include participants, coming from different background and nationalities (Cramton and Hinds, 2005; Gibson and Gibbs, 2006; Hinds, Liu, and Lyon, 2011; Hoch and Kozłowski, 2014). Virtual team benefits for the organizations are gained through removing redundancy of tasks, shrinking expenses, enhancing the employees work efficiency index, and shrinking travel and replacement expenditures (Gaeta et al., 2011; Sarker and Kirkeby, 2011; Hsu et al., 2011). On the other hand, the basis of a virtual team for coordinating the tasks is communication technology. Virtual team performance heavily relies on the effectiveness of communication between team members (Bjorn and Ngwenyama 2009; Lanubile et al., 2010). A defeat in virtual team communication leads to adverse consequences such as loss of productivity (Daim et al., 2012). Social media tools improve knowledge sharing and encourage collaboration and discussions

among the team members and may come up with the acceleration of Transactive memory systems (TMS) development in virtual teams (Choi et al., 2010; Leonardi et al., 2013). TMS are one of the most important elements in constructing effective business teams, since they provide a shared repository for encoding, storing, and retrieving information about different knowledge domains of the team members (Hollingshead, 1998). There are gaps in literature in terms of the role of social media within the context of virtual team communication (Bastida et al. 2013; Brown et al. 2007; Ou et al. 2013). To the best of researcher's knowledge, there are still visible gaps in the literature with regard to making sense of the use of social media tools for organizational virtual team communication, since no prior study has modeled and evaluated the effect of social media tools on virtual team performance through the development of TMS components mapping with the feature richness of social media. The main research questions in this study are:

- Q1: Does the social media usage encourage TMS development in organizational virtual teams?
- Q2: How does the use of social media tools affect virtual team performance?.

LITERATURE REVIEW

This section presents a comprehensive literature review on the subjects: virtual team and social media.

Virtual team

According to previous literature, research on virtual teams is still in its primary stages (Badrinarayanan and Arnett, 2008; Prasad and Akhilesh, 2002). Due to the relative novelty of virtual team concept, not many areas within this field of study have been investigated yet (Badrinarayanan and Arnett, 2008). The literature on virtual teams is divided into two main groups: firstly, the advantages and challenges associated with virtual work in comparison to face-to-face work (e.g. (Kirkman et al 2004; Bordia 1997), and secondly, the factors that impact the virtual team effectiveness (e.g. (Deeter-Schmelz, 2002; Lu et al., 2006, Maznevski and Chudoba, 2000)). As far as benefits are concerned, virtual teams are considered to be network effective, value based, quickly reconfigurable, cost-effective, decentralized and will vigorously revolutionize our world (Lipnack and Stamps, 1999). The ability of connecting people effectively and efficiently in addition to extending resources, are the main benefits of virtual team environment (Townsend et al., 1998) that leads to higher levels of productivity (Townsend et al., 1998; Suzanne, 2001; Mourino-Ruiz, 2010). Ethics improvement, fall in costs, a larger source of talents as well as higher balance between work and life are the subsequent benefits of virtual teams (Mourino-Ruiz, 2010). Although this is demonstrated that the team and organizational productivity are enhanced using multiple communication technologies (Majchrzak et al., 2000), other evidences are evolving to show that, team performance may get negatively influenced as members have to cope with an increasing number of communication technologies to cooperate with other virtual teams working independently and separately (Chudoba et al., 2005). In comparison to the face-to-face team, establishing coordination among team members in a virtual team is much more demanding, because the team tasks are highly organized (Ebrahim et al., 2009). In virtual teams, communicating information might be interpreted based on inherent cultural biases among team members that could lead to miscommunications, misunderstandings or distortions (Kayworth and Leidner, 2001). Knowledge sharing may also get negatively influenced in virtual teams due to cultural diversities (Zakaria et al., 2004).

In some literatures (Bélanger and Watson-Manheim, 2006; Watson-Manheim and Bélanger, 2007; Dennis et al., 2008; Turner and Reinsch, 2010), team performance is argued in terms of task efficiency and effectiveness. A multiplicity of factors impacting the effectiveness and the performance of virtual teams have also been identified in the literature. Features of relationships containing the variety of the team (Ancona and Caldwell, 1992), team status, team cohesion, and communication within the team (Driskell and Radtke, 2003) are all considered as important factors. Other factors that are seen impressive on team effectiveness include: net-centricity (Anderson and Shane, 2002), team member skills (Kanawattanachai and Yoo, 2007), personality traits of team members and group interaction styles

(Balthazard et al., 2004). In addition, some researches have concentrated on task-related factors (Bradley et al., 2003; Kirkman et al., 2004), whereas other studies have focused merely on social related factors (Chin et al., 1999; Matveev and Nelson, 2004). Therefore, the experiments show that further research is essential to explore the factors improving the performance of virtual teams.

Feature Richness of Social Media

Media richness theory classifies communication media in terms of their capacity of carrying information (Daft and Lengel, 1984). Richer media such as videoconferencing inspires team members a sense of being co-located, and provides synchronous communication (Kirkman and Mathieu, 2005). Media richness theory regards co-located interaction at the highest level of media richness (Daft and Lengel, 1986). However, the researchers put forward that where communication is the primary means of contact between the team members, 'feature richness' of the communication media is much more desirable than 'media richness' in the context of a virtual team (Gupta and Wingreen, 2014a). Feature richness is a feature of Social media and is not found in some other virtual team communication tools such as email and videoconferencing. Feature richness is defined as "the set of features that the communication medium offers to encourage participation, collaboration, transparency and information organization" (Gupta and Wingreen, 2014a).

CONCEPTUAL FRAMEWORK

The evidence from previous researches shows that communication media tools often apply their impacts on teams indirectly through mediating effects that encompass compensatory adaptation (Kock, 2007). Empirical studies illustrate that increased team performance is the result of team's adaption with communication media for dealing with task complexity (Kock, 2007; Kock 2005; Watson-Manheim and Bélanger, 2002). On the other hand, transactive memory systems have been widely studied in knowledge management research and practice. It has been well established that TMS can contribute to team performance and improvement by making expertise available for team members as well as enhancing the team collaboration in work processes (Lewis, 2004). Previous studies approve a positive relationship between TMS and team performance (Lewis, 2004; Kanawattanachai and Yoo, 2007; Zhang, Hempel, Han and Tjosvold, 2007). Austin (2003) confirmed that the positive relationship between TMS and team performance has been seen in both single project teams and mature continuing teams. The impact of TMS dimensions on team performance have been studied by some researchers.

However, there are still gaps in understanding of technology mediation in the context of TMS components mapping with the feature richness of social media tools and its outcomes on virtual team performance. In other words, the mediating role of TMS could be explored more fully by using a component-level approach and studying the individual effects of specialization, co-ordination and credibility (Choi et al., 2010; Hsu et al., 2012; Wegner, 1987) on the virtual team performance (Choi et al., 2010; Hsu et al., 2012; Wegner, 1987). This could be preceded by a detailed component-level examination of feature richness of social media tools on work processes, while the prior research findings have already confirmed the role of feature richness in social media tools (Gupta and Wingreen 2014). Thus, the researcher put forth a research model and proposes a component-level mapping between feature richness i.e. participation, collaboration, information organization and transparency, and the components of the TMS construct i.e. specialization, co-ordination and credibility for a deeper understanding of the effect of social media tools on the TMS and consequently, the effect on virtual team performance.

Research Model

TMS development depends on the communication technology, because frequent communication accelerates the development of the TMS (Kanawattanachai and Yoo, 2007). Social media tools capability of making teams interact and work together may result in co-ordination, specialization and credibility development in the virtual teams (Goodwin-Jones, 2003; Standing and Kiniti, 2011), inspire participation in teamwork activities (Hoffman and Fodor, 2010), support in maintaining organized

information of the projects (Bastida et al., 2013; Darisipudi and Sharma, 2008), and create a task-expertise association in the team. Social media tools also create transparency in project information by loading all necessary information in a central repository, which subsequently leads to the possibility of tackling communication or co-ordination challenges (Bertot et al., 2011; Kaplan and Haenlein, 2010). As a result, it is expected that social media tools usage lead to TMS development in virtual teams. The continuous use of social media tools leads to more participation, collaboration, information organization and transparency in virtual teams, which in turn brings about more specialization, coordination and credibility; that is, a well-developed TMS.

Taking into account the aforementioned issues, the following hypotheses are proposed by the researcher based upon the conceptual research model:

- 1) H1: The extent to which social media affects Specialization depends on Feature Richness of social media tools.
- 2) H2: The extent to which social media affects Credibility depends on Feature Richness of social media tools.
- 3) H3: The extent to which social media affects Coordination depends on Feature Richness of social media tools.
- 4) H4: Specialization mediates the effect of social media tools on Virtual team performance.
- 5) H5: Credibility mediates the effect of social media tools on Virtual team performance.
- 6) H6: Coordination mediates the effect of social media tools on Virtual team performance.
- 7) H7: There is a positive relationship between social media tools and Virtual team performance.

The conceptual research model is novel since, to the best of researchers' knowledge, no prior study has investigated the mediating role that TMS components mapping with the feature richness of social media tools could play in virtual team performance and also, no prior study has considered component-mapping between TMS and feature richness to provide a profound understanding of the effect of social media tools on the TMS and consequently the impact on virtual team's effectiveness.

RESEARCH METHODOLOGY

Our proposed research would be conducted using a combined method of research (Creswell 2014). A mixed method of research was considered appropriate for this research, since it would provide the researcher with a "very powerful mix" (Miles and Huberman, 1994, p. 42) and a more explicit image and detailed overview on the research topic (Tashakkori and Teddlie, 1998). A mixed method (Johnson, Onwuegbuzie, and Turner, 2007) provides the collection of manifold perspectives accessible on the topic, and both the quantitative and qualitative data could be used to explore the subject and make the results much more reliable (Miller and Gatta, 2006). Further, mixed technique of research, which comprises quantitative and qualitative research methods, has been used by previous Information Systems (IS) research (Ang and Slaughter, 2001; Gupta et al., 2012; Kaplan and Duchon, 1988). A mix of quantitative and qualitative methods would employ different viewpoints on the same subject and makes research findings to be more reliable and precise, which leads to a more comprehensive conclusion about the hypotheses and the research questions.

In this research, a likert-style questionnaire will be developed and pilot-tested to operationally apply and measure the variables in the research model. Likert questionnaire is expected to record the participants' experiences with social media communication in the context of feature richness and TMS components. Moreover, Semi-structured interviews not only guarantee that the domain represented by the research model does not dismiss or overlook any important constructs, but also add a level of richness that will inform the research as it moves from its exploratory phase into a phase of theory testing. Hence, a mixed method of research consisting of measured scales and semi-structured interviews is expected to explore most of the facts related to the research question and facilitate theory testing and validation. Participants of this research would be executives, managers and CEOs' of corporate organizations from a variety of

sectors (e.g. IT, banks, telecommunications, etc.) from all around the world, who work in virtual teams and communicate via social media (fully or partially) with their team members.

Conclusion

This research makes significant contributions to both practice and research. Theoretically, this research will make a contribution by examining how social media tools affect virtual team performance. First, this research will contribute literature by exploring and demonstrating the use of social media tools for virtual team communication and project work. Social media offers a unique and more collaborative environment (Bastida et al 2013; Goodwin-Jones 2003) than email, videoconferencing and telephone and is thus expected to have a positive effect on the TMS and consequently on virtual team performance. Second, this research contributes to the TMS theory (Wegner 1987) through the application of this theory in the context of feature richness of social media tools and also investigates the mediating role of TMS components on virtual team performance. This study will show the individual effects of specialization, co-ordination and credibility to provide a deeper understanding about the effect of social media tools on the TMS and consequently, the effect on virtual team performance.

References

- Ancona, D.G., Caldwell, D.F. (1992). Demography and design: predictors of new product team performance, *Organization Science* 3 (3) 321–341.
- Anderson, F.F., Shane H.M. (2002), The impact of net centrality on virtual teams: the new performance challenge, *Team Performance Management* 8 (1/2) 5–12.
- Ang, S., and Slaughter, S. A. (2001). Work Outcomes and Job Design for Contract versus Permanent Information Systems Professionals on Software Development Teams. *MIS Quarterly*, 25(3), 321-350.
- Austin, J. R. (2003), "Transactive memory in organizational groups: The effects of content, consensus, specialization, and accuracy on group performance", *Journal of Applied Psychology*, Vol. 88 no. 5, pp. 866-878.
- Badrinarayanan, V., and Arnett, D.B. (2008). Effective virtual new product development teams: an integrated framework. *Journal of Business and Industrial Marketing*, 23: 242-248.
- Balthazard, P., Potter, R.E., Warren, J. (2004). Expertise, extraversion and group interaction styles as performance indicators in virtual teams, *Database for Advances in Information Systems* 35 (1) 41–64.
- Bastida, R., Gupta, H. and Wingreen, S.C. (2013). A comparative study of the effect of blogs and email on virtual team performance. In *Proceedings of the 17 Pacific Asia Conference on Information Systems*, 18-22 June, Jeju Island, South Korea.
- Bélanger, F., and Watson-Manheim, M. B. (2006) "Virtual teams and multiple media: Structuring media use to attain strategic goals," *Group Dec. Negot.*, vol. 15, no. 4, pp. 299–321.
- Bertot, J. C., Jaeger, P. T. and Grimes, J. M. (2010). Crowd-sourcing transparency: ICTs, social media, and government transparency initiatives. In *Proceedings of the 11th Annual International Digital Government Research Conference on Public Administration Online: Challenges and Opportunities*, Digital Government Society of North America, 51-58.
- Bjorn, P. and Ngwenyama, O. (2009). Virtual team collaboration: building shared meaning, resolving breakdowns and creating translucence. *Information Systems Journal*, 19, 227-253.
- Bordia, P. (1997). Face-to-face versus computer-mediated communication: a synthesis of the experimental literature, *The Journal of Business Communication* 34 (1) 99–120.
- Bradley, J., White, B.J., and Mennecke, B.E. (2003). Teams and tasks: a temporal framework for the effects of interpersonal interventions on team performance, *Small Group Research* 34 (3) 353–387.
- Brown, M., Huettner, B., and James-Tanny, C. (2007) *Managing virtual teams: Getting the most from Wikis, Blogs, and Other Collaborative Tools*. Wordware Publishing Inc., Sudbury, MA.

- Chin, W.W., Salisbury, W.D., Pearson, A.W., and Stollak, M.J. (1999). Perceived cohesion in small groups: adapting and testing the perceived cohesion scale in a small-group setting, *Small Group Research* 30 (6) 751–766.
- Choi, S.Y., Lee, H., and Yoo, Y. (2010). The impact of Information Technology and Transactive Memory Systems on knowledge sharing, application and team performance: A field study. *MIS Quarterly*, 34(4), 855-870.
- Chudoba, K., E. Wynn, M. Lu, and M. B. Watson-Manheim. (2005). “How Virtual are We? Measuring Virtuality and Understanding its Impact in a Global Organization,” *Information Systems Journal* 15(4), 279–306.
- Cramton, C. D., and Hinds, P. J. (2005). Subgroup dynamics in internationally distributed teams: Ethnocentrism or cross-national learning? In B. M. Staw, and R. M. Kramer (Eds.), *Research in Organizational Behavior* (pp. 231–263). Greenwich, CT: JAI Press.
- Daft, R. L., and Lengel, R. H. (1984). Information Richness: A New Approach to Managerial Behavior and Organization Design. In B. Staw and L. L. Cummings (Eds.), *Research in Organizational Behavior*, Vol. 6, pp. 191-233.
- Daft, R. L., and Lengel, R. H. (1986). Organizational information requirements, media richness and structural design. *Management Science*, 32, 554–571.
- Daim, T.U., Reutiman, H.A., Hughes, S., Pathak, B., Bynum, U.W. and Bhatla, A. (2012). Exploring the communication breakdown in global virtual teams. *International Journal of Project Management*, 30 (2), 199-212.
- Deeter-Schmelz, D.R., Kennedy, K.N., Ramsey, R.P. (2002). Enriching our understanding of student team effectiveness, *Journal of Marketing Education* 24 (2) 114–124.
- Dennis, A. R., Fuller, R. M. and Valacich, J. S. (2008). “Media, tasks, and communication processes: A theory of media synchronicity,” *MIS Quart.*, vol. 32, no. 3, pp. 575–600.
- Driskell, J.E., Radtke, P.H. (2003). Virtual teams: effects of technological mediation on team performance, *Group Dynamics: Theory, Research and Practice* 7 (4), 297–323.
- Ebrahim, N.A., Ahmed, S., and Taha, Z. (2009). Virtual teams: A literature review, *Australian Journal of Basic and Applied Sciences*, 3(3), 2653-2669.
- Ferrazzi, K. (2012). Retrieved 3 March, 2013 from http://blogs.hbr.org/cs/2012/11/how_to_manage_conflict_in_virt.html
- Gaeta M., Orciuoli F., Loia V., Senatore, S. (2011). “A fuzzy agent-based approach to trust-based competency management”, IEEE international conference on fuzzy systems, Article number 6007603, Pages 102-109
- Gibson, C. B., and Cohen, S. G. (Eds.). (2003). Virtual teams that work. Creating Conditions for Virtual Team Effectiveness. San Francisco: Jossey-Bass.
- Gibson, C. B., and Gibbs, J. L. (2006). Unpacking the concept of virtuality: The effects of geographic dispersion, electronic dependence, dynamic structure, and national diversity on team innovation. *Administrative Science Quarterly*, 51, 451–495.
- Goodwin-Jones, R. (2003). Blogs and Wikis: Environments for On-Line Collaboration. *Language Learning and Technology*, 7(2), 12-16.
- Gupta, H., and Wingreen, S. C. (2014a). Understanding the Mediating Role of Social Media in Virtual Team Conflicts. In *Proceedings of the 18th Pacific Asia Conference on Information Systems*, Chengdu, China.
- Gupta, H., and Wingreen, S. C. (2014b). Understanding the Effect of Social Media Tools on Organisational Virtual Team Dynamics. In *Proceeding of 25th Australasian Conference on Information Systems*, Auckland, New Zealand
- Gupta, H., Nicholson, B., and Newman, M. (2012) Usage, impediments and attitudes towards social media in UK building societies. In *Proceedings of the 16th Pacific Asia Conference on Information Systems*, 11-15 July 2012, HoChiMinh City, Vietnam.
- Hertel, G.T., Geister, S., and Konradt, U. (2005). Managing virtual teams: A review of current empirical research. *Human Resource Management Review*, 15: 69-95.

- Hinds, P., Liu, L., and Lyon, J. (2011). Putting the global in global work: An intercultural lens on the practice of cross-national collaboration. *The Academy of Management Annals*, 5, 135–188.
- Hoffman Darisipudi, A., and Sharma, S.K. (2008). Blogs: A Computer Mediated Communication Tool for Virtual Team Collaboration. In S. Kelsey and K St. Amant (Eds.), *Handbook of Research on Computer Mediated Communication* (pp. 720-730). PA: Hershey.
- Hoffman, D. L. and Fodor, M. (2010). Can you measure the ROI of your social media marketing. *MIT Sloan Management Review*, 52(1), 41-49.
- Hollingshead, A. B. (1998). Communication, learning, and retrieval in transactive memory systems. *Journal of Experimental Social Psychology*, 34(5), 423-442.
- Horwitz, F.M., Bravington, D., and Silvis, U. (2006). The promise of virtual teams: identifying key factors in effectiveness and failure. *Journal of European Industrial Training*, 30(6), 472-494.
- Hsu, J.S.C., Shih, S.P., Chiang, J.C., and Liu, J.Y. (2012). The impact of transactive memory systems on IS development teams' coordination, communication, and performance. *International Journal of Project Management*, 30(3), 329-340.
- Johnson, R. B., Onwuegbuzie, A. J., and Turner, L. A. (2007). Toward a definition of mixed methods research. *Journal of Mixed Methods Research*, 1(2), 112-133.
- Kanawattanachai, P., and Yoo, Y. (2007). "The Impact of Knowledge Coordination on Virtual Team Performance over Time," *MIS Quarterly* (31:4), pp 783-808.
- Kaplan, A., and Haenlein, M. (2010). Users of the world, unite! The challenges and opportunities of Social Media. *Business Horizons*, 53, 59-68.
- Kaplan, B., and Duchon, D. (1988). Combining qualitative and quantitative methods in information systems research: a case study. *MIS quarterly*, 571-586.
- Kayworth, T.R., and Leidner, D.E. (2001). Leadership effectiveness in global virtual teams, *Journal of Management Information Systems*, 18(3), 7-40.
- Kirkman, B.L. and Mathieu, J.E. (2005). The Dimensions and Antecedents of Team Virtuality. *Journal of Management*, 31 (5), 700-718.
- Kirkman, B.L., Rosen, B., Tesluk, P.E., Gibson, C.B. (2004). The impact of team empowerment on virtual team performance: the moderating role of face-to-face interaction, *Academy of Management Journal* 47 (2) 175–192.
- Kock, N. (2005). "Media richness or media naturalness? The evolution of our biological communication apparatus and its influence on our behavior toward e-communication tools," *IEEE Trans. Prof. Commun.*, vol. 48, no. 2, pp. 117–130.
- Kock, N. (2007). "Media naturalness and compensatory encoding: The burden of electronic media obstacles is on senders," *Dec. Support Syst.*, vol. 44, no. 1, pp. 175–187.
- Lanubile, F., Ebert, C., Prickladnicki, R. and Vizcaino, A. (2010). Collaboration Tools for Global Software Engineering. In *Proceedings of the IEEE Conference on Global Software Engineering*, 23-26 August, 2010, Princeton, NJ, USA.
- Leonardi, P. M., Huysman, M. and Steinfield, C. (2013). Enterprise social media: Definition, history, and prospects for the study of social technologies in organizations. *Journal of Computer-Mediated Communication*, 19(1), 1-19
- Lewis, K. (2003). Measuring Transactive Memory Systems in the Field: Scale Development and Validation. *Journal of Applied Psychology*, 88(4), 587-604.
- Lewis, K. (2004). "Knowledge and Performance in Knowledge-Worker Teams: A Longitudinal Study of Transactive Memory Systems", *Management Science*, Vol. 50 no. 11, pp. 1519-1533.
- Lipnack, J., and Stamps, J. (1999). Virtual teams: The new way to work, *Strategy and Leadership*, 27(1), 1999, 14-19.
- Lu, M., Watson-Manheim, M.B., Chudoba, K.M., Wynn, E. (2006). Virtuality and team performance: understanding the impact of variety of practices, *Journal of Global Information Technology Management* 9 (1) 4–23.
- Majchrzak, A., Rice, R. E., Malhotra, A., King, N., and Ba, S. (2000). "Technology Adaptation: The Case of Computer-Supported Inter-Organizational Virtual Team," *MIS Quarterly* 24(4), 569–600.

- Matveev, A.V., and Nelson, P.E. (2004). Cross cultural communication competence and multicultural team performance-perceptions of American and Russian managers, *International Journal of Cross Cultural Management*, 4 (2) 253–270.
- Maznevski, M.L., Chudoba, K.M. (2000). Bridging space over time: global virtual team dynamics and effectiveness, *Organization Science* 11 (5) 473–492.
- Miller, S. I., and Gatta, J. L. (2006). The use of mixed methods models and designs in the human sciences: problems and prospects. *Quality and Quantity*, 40(4), 595-610.
- Mourino-Ruiz, E.L. (2010). Effective leader-employee relationships in the 21st century, in E. Beich (Ed.), *The 2010 Pfeiffer annual consulting* (San Francisco: John Wiley and Sons) 265-280.
- Ou, C. X., Sia, C. L., and Hiu. C. K. (2013) Computer-mediated communication and social networking tools at work. *Information Technology and People*, 26(2), 172-190.
- Prasad, K., and Akhilesh, K.B. (2002). Global virtual teams: what impacts their design and performance? *Team Performance Management*, 8: 102 - 112.
- Sarker S., Ahuja M., Sarker S., Kirkeby S. (2011). “The Role of Communication and Trust in Global Virtual Teams: A Social Network Perspective”. *Journal of Management Information Systems*, Vol. 28, No. 1, pp. 273–309. M.E. Sharpe, Inc.0742–1222 DOI 10.2753/MIS0742-1222280109
- Standing, C. and Kiniti, S. (2011). How can organizations use wikis for innovation?. *Technovation*, 31 (7), 287-295
- Suzanne, G. (2001), Virtual teams, real benefits, *Network World*, 18(39), 45.
- Tashakkori, A., and Teddlie, C. (1998). *Mixed Methodology: Combining Qualitative and Quantitative Approaches*. Thousand Oaks, CA: Sage.
- Turner J. W., and Reinsch, N. L. (2010). “Successful and unsuccessful multi-communication episodes: Engaging in dialogue or juggling messages,” *Inf. Syst. Frontiers*, vol. 12, no. 3, pp. 277–285.
- Wakefield, R.L., Leidner, D.E., and Garrison, G. (2008). Research Note- A model of conflict, leadership and performance in virtual teams, *Information Systems Research*, 19(4), 434-455.
- Watson-Manheim, M. B., and Bélanger, F. (2002). “Support for communication-based work processes in virtual work,” *e-Service J.*, vol. 1, no. 3, pp. 61–82.
- Watson-Manheim, M. B., and Bélanger, F. (2007). “Communication media repertoires: Dealing with the multiplicity of media choices,” *MIS Quart.*, vol. 31, no. 2, pp. 267–293.
- Wegner, DM. (1986). Transactive memory: A contemporary analysis of the group mind. In: Mullen B, Goethals GR *Theories of group behavior*. New York: Springer-Verlag . pp. 185-208.
- Zakaria, N., Amelinckx, A., and Wilemon, D. (2004). Working together apart? Building a knowledge sharing culture for global virtual teams, *Creativity and Innovation Management*, 13(1), 15-29.
- Zhang, Z.-X., P. S. Hempel, Y.-L. Han and D. Tjosvold (2007), "Transactive memory system links work team characteristics and performance", *Journal of Applied Psychology*, Vol. 92 no. 6, pp. 1722-1730.