

Research Article

A Survey Based Study on Factors Effecting Communication in GSD

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Abstract: Presently, most of software development companies are trying to globalize their work throughout the world in order to get the various benefits. The phenomenon of this software globalization is called Global Software Development (GSD). However, GSD is not a simple job and the software companies face various challenges. In GSD Communication is a main issue and it became more complicated during Requirements Change Management (RCM). This research will result to explore different factors that can negatively affect communication during the RCM process by conducting a survey in GSD industry. A framework is proposed for the factors effecting communication and total nine hypotheses are developed. A quantitative research method has been used to collect and analyse the data. The results show that total seven out of nine hypotheses are supported and two hypotheses are rejected.

Keywords: Communication, framework, global software development, requirements change management

INTRODUCTION

Recently, majority of the software development companies are globalizing their development activities. In GSD, the organizations performed the software development under various boundaries such as temporal, geographical and socio-cultural distances (Helena *et al.*, 2006; Smite *et al.*, 2008). Nowadays, GSD is the necessity of software development organizations. Benefits of GSD like proximity to market, access to skilled labour pool, improving time to market and low labour cost have motivated different organizations to globalize their work (Bass *et al.*, 2009; Helena *et al.*, 2006; Herbsleb *et al.*, 2005; Smite *et al.*, 2008) along with the different benefits GSD also faces different challenges. Some of the researchers stated that geographical, socio-cultural and temporal distances are the three main factors for the failure of global software projects (Bass *et al.*, 2009; Herbsleb, 2007; Herbsleb and Mockus, 2003; Herbsleb *et al.*, 2005). Due to these three factors GSD faces three challenges i.e., communication, coordination and control (Carmel, 1999; Herbsleb *et al.*, 2005; Korkala and Abrahamsson, 2007).

In GSD, during software development process requirements continuously change from software requirements phase to maintenance phase. Requirements Change Management (RCM) process is one of the most serious activities and it poses

significant difficulties with distributed software development teams (Sengupta *et al.*, 2006). The lack of proper RCM may lead to software failure or even loss of business as well however managing change is rewarding but challenging at the same time (Ramzan and Ikram, 2005).

It is very difficult to manage change requirements due to certain communication and coordination challenges. Communication is one of the major issues during RCM process in global software projects due to geographical, socio-cultural and temporal distances (Casey and Richardson, 2008; Huang and Trauth, 2007; Moe and Šmite, 2008).

From the above discussion it can be concluded that there are three main factors (Geographical distance, Socio-cultural distance, temporal distance) which effect communication in GSD and causes various communication issues during RCM process. So, the objective of this research is to conduct a comprehensive survey based study on existing literature. A framework is proposed for factors effecting communication in GSD during RCM.

FRAMEWORK AND HYPOTHESIS DEVELOPMENT

In this section, we discuss a proposed framework, developed for the factors effecting communication in GSD. As mentioned in introduction section, there are

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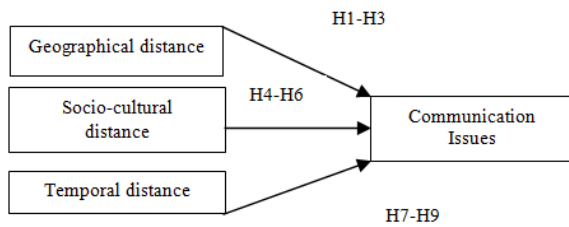


Fig. 1: Proposed framework

three main factors on the bases of which a framework is proposed. This framework is shown in Fig. 1. The details of the framework are discussed below.

Geographical distance: Geographical distance is actually the physical separation between team members, located at different remote sites. Two sites within the same country with regular flights can be considered close even if separated by huge distance, but different sites which have little transportation and perhaps intervening borders cannot be geographically close. In general, low geographical distance offers high opportunity for team members of co-located, development (Helena *et al.*, 2006).

- **Weak communication:** During the early stages of software development, direct communication of remote team members is absolutely necessary (Herbsleb, 2007). So, in GSD due to lack of group cohesiveness among distributed team members the communication becomes weak which causes diverse communication issues. Due to weak communication there is poor relationship among the team members which increases the rework frequency (Herbsleb, 2007). In this case, it is important to know that whether weakness of communication originate the communication issues/risks or not. So we could propose a hypothesis as below.

H1: Weak communication has positive relationship with communication issues.

- **Lack of face to face meeting:** GSD literature has highlighted the lack of face-to-face communication as a major drawback of the approach to global software development. Geographical distance decreases the opportunities of face to face communication to take place. In GSD, breakdowns in face to face communication could easily lead to misunderstandings in design conventions and face-to-face contact is necessary to overcome misunderstandings of requirements (Curtis *et al.*, 1988). Due to lack of face to face communication it may possible that communication issues/risks

occur among dispersed team members. Therefore we could propose a hypothesis as below.

H2: Lack of face to face meeting has positive relationship with communication issues.

- **Lack of trust:** Trust among dispersed team members in GSD is essential for the development of personal networks and personal relationships (Boutellier *et al.*, 1998). It is also noted in (Imsland *et al.*, 2003) that trust is a complex phenomenon when looking at the role of trust in global software outsourcing.

Geographical distance effect communication in GSD which hinder the creation of trust (Pyysiäinen, 2003). It is difficult to establish trust among newly-established dispersed teams due to communication issues (Carmel, 1999). When there is a lack of trust, there is a lack of willingness to communicate (Herbsleb *et al.*, 1995) and the amount of information disclosed to remote colleagues may be limited. So, based on above discussion we could propose following hypothesis.

H3: Lack of trust has Positive relationship with Communication issues.

Socio-cultural distance: Socio-cultural distance is a degree to which members of group differ on dimensions of language, social status, religion, politics, economic conditions and basic assumptions. Culture can have an enormous effect on how people interact on different matters and how they response to it (Helena *et al.*, 2006).

- **Poor business language skills:** Recently, English is used as an international business language, but language is still a huge problem for communication in GSD. As a result of poor business language skills, communication risks can arise (Kotlarsky and Oshri, 2008; Levina and Vaast, 2008). Software developers communicate through a common institutional language. However, the understanding of the intended meaning of such language is affected by organisational and socio-cultural distance, since the understanding depends on culture, organisation, contexts, profession and local politics (Rönkkö, 2007). Poor business language skills cause various communication issues/risks among dispersed team members. Therefore, based on above discussion following hypothesis could be developed.

H4: Poor business language skills reflect a positive relationship with communication issues.

- **Lack of cultural awareness:** Each culture has their own norms, styles and values which can generate communication issues when people from

different cultural backgrounds communicate with each other (Kiel, 2003; Sahay and Walsham, 1997). Kiel (2003) described about a project that failed due to a combination of social, cultural, language and political issues. In GSD, Geographical and Temporal distances increase the effects of Socio-cultural distance which can make the development process and communication more difficult (Nicholson and Sahay, 2001). Based on this discussion we could develop following hypothesis

H5: Lack of cultural awareness reflects a positive relationship with communication issues.

- **Lack of mutual understanding:** Apart from cultural awareness there are a few other difficulties arising from socio-cultural distance. In GSD people came from different cultural backgrounds and they have their own cultural styles (Sahay and Walsham, 1997). Language is very much a part of a national culture and is intertwined with social norms and values. Difference in languages and communication styles can create misunderstanding between team members which can negatively effects communication in GSD (Imsland *et al.*, 2003). So, for lack of mutual understanding following hypothesis could be developed

H6: Lack of mutual understanding has a positive relationship with communication issues

Temporal distance: Temporal distance is time gap among two groups wishing to communicate. Temporal distance is result of different factors including the two actors located at two different time zones. Geographical distance causes the temporal distance between the different actors who want to interact with each other (Ågerfalk *et al.*, 2005). Temporal distance occurs when working hours among distributed team members do not overlap

- **Less overlapping:** The main disadvantage of temporal distance is that the number of overlapping hours during a workday is reduced between sites which can lead to miscommunication (Kiel, 2003). For example, a team located across the both the eastern U.S. and in Ireland can have a total of three overlapping hours during a work day (Casey and Richardson, 2004). In this regard, less overlapping has been considered a positive influence factor for communication issues/risks in GSD (Kiel, 2003). Therefore we could develop following hypothesis

H7: Less time overlapping has positive relationship with Communication issues.

- **Delay in response:** Delay in response is seen as problematic and frustrating for globally distributed team members working in various time zones. Sometimes, team members trying to develop something very quickly then communication becomes a big issue due to temporal distance. If there is any need to ask from any other remote team member then it will be difficult to get fast response (Helena *et al.*, 2006). Therefore, delay in response make team members unable to find track of the overall developing process and it can be a serious problem in distributed software development (Helena *et al.*, 2006).Therefore, following hypothesis could propose

H8: Delay in response has positive relationship with communication issues.

- **Dependency on asynchronous communication:** The use of asynchronous communication tools can be risky for communication and coordination. E-mail can “get lost” or “forgotten”, introducing an uncertainty of whether or not a reply will be forthcoming and introducing the need to resend e-mails after a number of days (Siakas *et al.*, 2006). Asynchronous communication can also increase misunderstanding between the team members e.g., the exchange of ideas through e-mail can increase the risk of misunderstanding. An ambiguous question posed in an e-mail can result in lengthy e-mail chains which are only broken by intervention by management (Paasivaara *et al.*, 2008). In this regard the following hypothesis could be developed.

H9: Dependency on asynchronous communication has positive relationship with communication issues.

METHODOLOGY

The targeted population was GSD industries in Pakistan. In this study, GSD organizations are randomly selected from (Board, 2011/2012). The population of the study is mostly technical staff in GSD organizations. Two approaches were used for data collection i.e., online approach and self administrated questionnaire (Dillman, 2006). The sample of 380 questionnaires was sent to ten GSD organizations, where 206 responses were collected. From 206 responses, 163 responses were complete while the rest of the questionnaires were incomplete.

Data was analyzed through (SPSS Version-19) using reliability analysis and regression analysis for hypothesis testing.

RESULTS AND DISCUSSION

Demographic profiles of respondents and companies: To provide an insight about gender,

Table 1: Summary on respondent's demographics

Respondents		Frequency	Valid %
Gender	Male	130	79.8
	Female	33	20.2
Total		163	100.0
Position	Developer	59	36.2
	Designer	29	17.8
	Analyst	21	12.9
	Tester	30	18.4
	Team Manager	20	12.3
	CEO	4	2.5
Total		163	100.0
Education	High school	1	0.6
	Diploma	21	12.9
	Graduate	130	79.8
	Postgraduate	11	6.7
Total		163	100.0
Working Experience	Less than year	11	6.7
	1-6	111	68.1
	5-11	35	21.5
	10-15	6	3.7
Total		163	100.0

Table 2: Nature of projects

		Frequency	Valid %
Nature of projects	Web development	32	19.6
	Software development	107	65.6
	Other	24	14.7
Total		163	100.0

Table 3: Number of employees

Number of employees	Frequency	Valid%
Less than 20	14	8.6
21-40	31	19.0
41-60	40	24.5
61-80	21	12.9
81-100	24	14.7
More than 100	33	20.2
Total	163	100.0

education and positions of respondents in company, several descriptive statistics are used to describe the demographic profile of the respondents and companies.

Demographic profile of respondents: Brislin *et al.* (1973) discussed the significance of detailed information on a sample of descriptive statistics, in which the information could provide close view of respondents and companies which are deemed to interpret the more significant results.

- **Gender:** In this research survey male respondents were more than that of female ones. Total 163 respondents gave response to our research survey, 130 of these respondents were male presenting 79.8% of the all respondents, whereas 33 were female presenting 20.2% of the overall respondents
- **Position:** It is important to analyze respondent's position in organization. Respondents' positions were classified into developer, designer, analyst, tester, team manager and CEO (Table 1). Most of respondent's positions were developer, 59 of the overall respondents which is 36.2%. Remaining positions were designer and analyst with 29 and 21,

presenting 17.8 and 12.9%, respectively. Other positions were the tester and team manger with 30 and 20 representing 18.4 and 12.3%. The last position was the CEO with 4 representing 2.5%

- **Education:** The knowledge of the respondents can be determined by analyzing their education level. In this research, out of 163 respondents, 130 have bachelor degree which presents 79.8%, subsequently 21 and 11 respondents have diploma and postgraduate, presenting 12.9 and 6.7, respectively. Only 1 respondent was high school certificate holder, representing 0.6%. Generally, most of respondents were holding bachelor's degree, which imitate a positive sign of education level of team members in GSD industry
- **Working experience in GSD:** The context of this research is GSD industries. It is important to investigate the working experience of employees. In this research, the highest working experience in GSD industries ranged from 1 to 5 years representing 68.1% and the second highest value ranged from 6 to 10 years, representing 21.5%. While 11 employees have working experience less than a year, representing 6.7%. The lowest value ranged from 11 to 15 years is 6 which present 3.7% (Table 1).

Companies' background: It is important to inspect complete background of companies where research survey was conducted. It is also imperative to investigate the nature of projects developed in GSD and full-time employees.

- **Nature of projects:** In this study, the GSD industries were the focus for research study. Based on GSD industries, there are various types of projects developed. In this research, the nature of industries was not specified as the study itself used a simple random approach. The natures of the projects are web Development and Software Development (Table 2)
- **Number of employees:** In this research study, both small and medium size GSD industries are randomly selected. A clear picture of organizations size could be acquired by examining the number of employees

In this research, the highest number of employees in GSD organizations varies from 41 to 60 representing 24.5% and the second highest full-time employees were more than 100, representing 20.2%. These two figures specified that these organizations are small to medium size organizations. The third and fourth highest values ranged from 21 to 40 followed by 81 to 100 representing 19.0% and 14.7%, respectively. Lowest frequency ranged from 61 to 80 followed by less than 20 representing 12.9% and 8.6%, respectively. A complete review of full time employees has been described in Table 3.

RELIABILITY ANALYSIS OF SURVEY INSTRUMENT

Cronbach Alpha test has been used to analyze the reliability of the questionnaire. According to Nunnally (2010) and Jöreskog and Sörbom (1989) 0.70 is an acceptable Alpha reliability value. Hence, Alpha reliability was set to 0.70 as an acceptable reliability. The results of the Alpha Reliability are shown in Fig. 2.

'N of Cases' shows total number of respondents whereas 'N of Items' shows the total number of items which have been tested for reliability. The alpha value, which is 0.734, shows that 73.4% of data is reliable. As mentioned earlier, it is higher than the acceptable value of reliable data.

The three main factors due to which communication issues occur has been categorized into three main contexts which include geographical distance, socio-cultural distance and temporal distance. Each context has been analyzed separately for reliability analysis.

- Geographical distance reliability analysis:** Geographical distance has three variables (main items in the scale) that are depicted in Table 4. The reliability of main items of it has been analyzed to examine each of variable reliability for data analysis. The first variable, weak communication has four items and Alphas is 0.739. The second variable is lack of face to face meeting that has three items and Alphas is 0.797. Last variable, lack of trust has four items and Alphas is 0.725. All Alpha variables are greater than 0.70 shows that the geographical distance data is reliable for data analysis.
- Socio-cultural distance reliability analysis:** Socio-cultural distance has three variables, lack of mutual understanding, poor business language skills and lack of cultural awareness. Reliability of four independent variables was performed in order to examine the reliability of socio-cultural distance. First independent variable consists of five items with 0.789 Alpha, the second variable contains two items and alpha value is 0.741 and third variable has four items and Alpha value is 0.709. All variables of socio-cultural distance are reliable for analysis, which is discussed in Table 5.
- Temporal distance reliability analysis:** Temporal distance has also three variables, less overlapping, delay in response and dependency on asynchronous communication. These variables reliability has been conducted in order to analyze temporal distance reliability analysis. Less overlapping has four items and Alpha is 0.727 (Table 6). Delay in response has two items and Alpha is 0.883. Dependency on asynchronous communication has three items and Alpha value is 0.806. Alpha values of all variables are greater than 0.70, showing that the items for analysis are reliable.

Reliability analysis scale (alpha)	
Reliability coefficients	
N of Cases = 163.0	N of Items = 45
Alpha = 0.734	

Fig. 2: Alpha reliability analysis of the data

Table 4: Geographical distance reliability

Main Items in the scale	No. of Items	Alpha
Weak communication	4	0.739
Lack of face to face meeting	3	0.797
Lack of trust	4	0.725

Table 5: Socio-cultural distance reliability

Main items in the scale	No. of items	Alpha
Lack of mutual understanding	5	0.789
Poor business language skills	2	0.741
Lack of cultural awareness	4	0.709

Table 6: Temporal distance reliability

Main Items in the scale	No. of items	Alpha
Less overlapping	4	0.727
Delay in response	2	0.883
Dependency on asynchronous communication	3	0.806

Table 7: Communication issues reliability analysis

Main Items in the scale	No. of items	Alpha
Communication issues	3	0.783

- Communication issues reliability analysis:** A communication issue is a dependent variable of geographical distance, socio-cultural distance and temporal distance. It is also significant to analyze the dependent variable reliability. The reliability of communication issues is 0.783 with three items (Table 7). This shows that the dependent variable data is also reliable for further analysis.

HYPOTHESIS TESTING

The following section of this study will present the results obtained and will also present the analysis of the results. Regression analysis has been used to analyze the relationship between several variables. Before presenting the results, it is important to present the interpretation for various correlation and regression coefficients, based on which the strength, direction and impact of a relationship can be determined. Values of R, R² and P (significance) value have been used to analyze the results.

Value of R shows the strength of the relationship. It ranges from +1 to -1. A value of R which is closer to '+1' shows the strength of the correlation relationship, whereas a value of R closer to '0' shows a weaker or no correlation relationship, at the same time a value of R below '0' shows a negative correlation relationship. The positive or negative signs with the value show the direction of the relationship. For example a positive sign shows that if one increases the other also increases. The value of R² indicates the percentage of variance in

Table 8: Model summary

Model	R	R ²	Adjusted R ²	S. E. of the estimate
1	0.860a	0.740	0.734	0.677

Predictors: (constant); weak communication; lack of face to face meeting; lack of trust

Table 9: Coefficients of Geographical distance variables

Model	Un-standardized coefficients		Standardized coefficients	t	Sig.
	B	S.E.			
1 (Constant)	-0.663	0.233	β	-2.851	0.005
Weak communication	0.493	0.075	0.419	6.597	0.000
Lack of face to face meeting	0.246	0.055	0.203	4.481	0.000
Lack of trust	-0.064	0.051	-0.052	-1.254	0.212

a: Dependent variable: communication Issues

Table 10: Model summary

Model	R	R ²	Adjusted R ²	S.E. of the estimate
1	0.819a	0.671	0.662	0.765

a: Predictors: (constant); lack of mutual understanding; poor business language skills; lack of cultural awareness

Table 11: Coefficients of socio-cultural distance variables

Model	Un-standardized coefficients		Standardized coefficients	t	Sig.
	B	S.E.			
1(Constant)	-1.027	0.517	β	-1.998	0.049
Lack of mutual understanding	0.880	0.050	0.817	17.751	0.000
Poor business language skills	0.158	0.065	0.112	2.433	0.016
Lack of cultural awareness	-0.025	0.101	-0.011	-0.246	0.806

a: Dependent variable: communication Issues

dependent variable caused by independent variable. At the same time value of P shows the significance of the relationship. If p-value is less than 0.05, then we can say that the relationship is significant (Sweet and Grace-Martin, 2011).

Geographical distance: Geographical distance has been investigated by multiple regressions to assess the correlation between the predictors (weak communication, lack of face to face meeting and lack of trust) with communication issues. The figures given in Table 8 and 9 show various important results regarding the dependent and independent variables.

The Table 8 shows the correlation value R as 0.860. This shows that all independent variables have strong correlation with communication issues. Another important value is R², which is 0.740. Value of R² shows the variance in dependent variable which can be predicted by independent variable. This value shows that 74.0% variance in communication issues can be predicted by all independent variables (weak communication, Lack of face to face meeting and Lack of trust).

The Table 9 showed the result of weak communication having beta value 0.419. This illustrates a positive influence over communication issues and the value of P (sig) is 0.000, which is less than 0.05. This shows that weak communication supports hypothesis of this research. Lack of face to face meeting supports the hypothesis of this research, having a beta value of 0.203. This shows positive relationship of lack of face to face meeting and communication issues and the

Table 12: Model summary

Model	R	R ²	Adjusted R ²	S.E of the estimate
1	0.815a	0.664	0.655	0.773

a Predictors: (constant); less overlapping; delay in response; dependency on asynchronous communication

value of P (sig) is 0.000 which is less than 0.05. Such relationship result of lack of face to face meeting supports the hypothesis of this research. Table 9 shows the result of lack of trust with a beta value of -0.052, which shows a negative influence over communication issues. Also the value of P (sig) is 0.212, which is greater than 0.05. This implies that there is no correlation between lack of trust and communication issues. Based on the above results, lack of trust is not supported.

Socio-cultural distance: Socio-cultural distance has been investigated by multiple regressions to assess the correlation between the predictors of lack of mutual understanding, poor business language skills and lack of cultural awareness with communication issues. Results given in Table 10 and 11 present various important results regarding dependent and independent variables.

The Table 10 shows correlation value R as 0.819; this shows a strong relationship among predictors (Lack of mutual understanding, poor business language skills and lack of cultural awareness) with communication issues. Value of R² reaching at 0.671, representing that 67.1% variation in dependent variable (communication issues) can be predicted by independent variables (Lack of mutual understanding, poor business language skills and lack of cultural awareness).

Table 13: Coefficients of temporal distance variables

Model	Un-Standardized coefficients		Standardized coefficients	t	Sig.
	B	S.E.			
1 (Constant)	-1.184	0.325	β	-3.643	0.000
Less overlapping	0.734	0.047	0.718	15.466	0.000
Delay in response	0.326	0.064	0.245	5.094	0.000
Dependency on asynchronous communication	0.210	0.082	0.120	2.557	0.011

a. Dependent variable: communication Issues

Table 14: Summary of hypothesis results

S. no	Hypothesis No	Independent variables	Dependent variables	Results
1	H1	Weak communication	Communication issues	Supported
2	H2	Lack of face to face meeting	Communication issues	Supported
3	H3	Lack of Trust	Communication issues	Not supported
5	H4	Lack of mutual understanding	Communication issues	Supported
6	H5	Poor business language skills	Communication issues	Supported
7	H6	Lack of cultural awareness	Communication issues	Not supported
9	H7	Less overlapping	Communication issues	Supported
10	H8	Delay in response	Communication Issues	Supported
11	H9	Dependency on asynchronous communication	Communication Issues	Supported

The Table 11 shows lack of mutual understanding having beta value 0.817. It shows a positive influence over the communication issues and also value of P (sig) is 0.000 which is less than 0.05. This shows that lack of mutual understanding and communication issues have positive relationship. From above discussions it can be concluded that lack of mutual understanding supports the hypothesis in this research. Table 11 shows poor business language skills having beta value 0.112. This shows a positive relationship of poor business language skills with communication issues and value of P (sig) is 0.016 which is less than 0.05. It shows that poor business language skills is positively related to communication issues. Based on these results, the hypothesis about poor business language skills has been supported in this research. Result of lack of cultural awareness having beta value -0.011 showing a negative influence of lack of cultural awareness with communication issues. Similarly Value of P (sig) is 0.806 which is greater than 0.05. It indicates that lack of cultural awareness is negatively related to communication issues. Therefore, the hypothesis of lack of cultural awareness didn't support in this research.

Temporal distance: Temporal distance has been investigated by multiple regressions to examine the relationship between the independent variables (less overlapping, delay in response and dependency on asynchronous communication) with dependent variable communication issues. The values given in Table 12 and 13 presented various important results regarding dependent and independent variables.

The Table 12 shows the value of R is 0.815; this indicates a positive correlation among predictors (less overlapping, delay in response and dependency on asynchronous communication) with communication issues. Value of R² shows the variance in dependent variable which can be predicted by independent

variable. As shown in Table 12 value of R² 0.664, indicating that 66.4% variation in communication issues can be predicted by independent variables (less overlapping, delay in response and dependency on asynchronous communication).

Table 13 shows the results of less overlapping having beta value of 0.718. This shows a positive influence of less overlapping with communication issues also value of P (sig) is 0.000 which is less than 0.05. It points that there is positive correlation of less overlapping and dependent variable communication issues. The hypothesis about less overlapping has been supported in this research. Delay in response having a beta value of 0.245. This shows a strong positive influence of delay in response with communication issues. Table 13 also shows another important value P (sig) which is 0.000 and less than 0.05. This result implies that delay in response has significantly related to communication issues. Another variable is dependency on asynchronous communication having beta value 0.120. This shows a positive influence over the communication issues. The value of P (sig) is 0.011 which is less than 0.05. It shows that there is positive correlation of dependency on asynchronous communication with communication issues. Based on the above evidence, hypothesis of dependency on asynchronous communication supports in this research.

The reliability analysis and regression analysis of variables is performed and the summary of all the hypotheses results is presented in Table 14.

From above discussion two hypotheses that are lack of trust and lack of cultural awareness, one from geographical distance and the other from socio-cultural distance have been rejected in this research. The rest of eight hypotheses have been supported. Therefore, the final proposed framework is given in Fig. 3.

The result of R for two predictors of geographical distance is obtained 0.860. This shows that two variables have strong positive correlation with

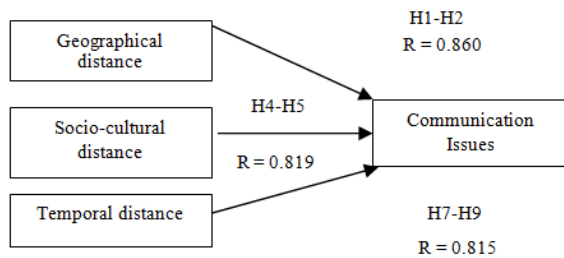


Fig. 3: Final proposed framework

communication issues. It also implies that more geographical distance among dispersed team members can highly influence the communication in GSD.

Similarly R value calculated for two predictors of socio-cultural distance is 0.819. It shows a strong positive correlation of poor business language skills and cultural awareness with communication issues. It also indicates that due to high socio-cultural distance among distributed team members, various communication issues can take place.

At last R value obtained for three predictors of temporal distance is 0.815. This value indicates strong positive correlation among independent variables (less overlapping delay in response, dependency on asynchronous communication) and dependent variable (communication issues).

CONCLUSION

In this research study communication during the RCM process in GSD has been assessed on the bases of various factors in context of geographical, socio-cultural and temporal distances. The negative effect of these factors on communication has been examined. In this study a framework was proposed and nine hypotheses have been developed to examine the negative effect of different factors on communication. The results have shown that seven hypotheses are supported and two hypotheses are rejected. This indicates that two (factors lack of trust, lack of cultural awareness) didn't create any communication issues and the rest of seven factors highly negative affected communication.

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