INFORMATION TECHNOLOGY AND THE NEED FOR CLEAR COMMUNICATION FOR EFFECTIVE USER'S APPROACH

Adriane Setti
Marisa Cesário
Sílvia Fernandes
Júlio Mendes

ABSTRACT

The present study addresses the communication between professionals of information technology (IT) and its users in the corporate environment of Curitiba (Brazil). The main aim was to analyze communication problems and implications for management and marketing. Empirical research examined responses from a sample of IT professionals with some professional experience in the area and academic level, as well as responses from a sample of IT users (making use of technology in that corporate environment). The questionnaires were available online, and the SPSS software was used for data processing. Results allow us to infer that, in the sample studied, problems in communication between IT professionals and the services' users do exist. Data obtained reflect a need for formal training by the professionals to serve customers, manage their careers and use technology on behalf of users in order to improve business management practice. Professionals must be clear with users, to create confidence. Also, it was evident that respondent users consider technology as a basic tool, and they expect professionals to share and explain their actions toward the machine or system. This research makes some implications obvious in relation to communication processes in the IT field for management and marketing.

Keywords: Information Technology, Communication, Interaction, Management, Marketing

JEL Classification: M15

1. INTRODUCTION

Globalization and, consequently, information technology (IT) changes introduced technical and foreign terms in professionals' vocabulary due to a logical need of explicit use. However, those expressions, which became part of many organizational routines, are not always understood by the users. The technical language naturally broadened vocabulary, placing it even more in contact with the English language ('language of globalization'). Furthermore, technology develops itself faster than the capacity of Portuguese or other languages to assimilate all new concepts and find the correct terms. Thus, certain strategies are needed to improve communication for better management support.

These situations are the focus of this study as many communication problems result from the fact that the consumer (user/client) not always dominates, or just does not know, several terms in the IT field. This study does not consider that professionals deliberately choose words that are difficult understand or that customers are uncultured. What we discuss are the consequences from the inherent semantic problem because the understanding level of

what is said can influence the level of confidence, making a difference in a negotiation (Gaete, 2010; Hanson, 2010; Partala and Kallinen, 2012).

Effective interactivity has vital importance once the option of using or not using a tool (or a system) is affected. The technician should be aware of this issue and establish a plan to understand and make himself understandable (Cassarro, 2011). Professionals must be flexible and able to adapt to specific, local, regional and semantic situations. It is relevant to capture what the consumer understands and, especially, what he/she really needs. The identity and clarity between parts open paths to strengthen confidence relations between IT professionals and users. Professionals should have personal marketing as a strong ally for the continuity of users' loyalty. This is created through confidence in a given service, based on clear communication, adapting knowledge and vocabulary. Clients do not only buy products but also services (Madia de Souza, 2007); thus, in the IT field, they do not only search for equipments or programs but also for security, information organization and problem solving. Consequently, they demand technical support and, sometimes, personal support because there are still users that resist technology and systems.

According to these considerations, the subject of this study was defined as communication processes in the IT field and its impacts on management and marketing. This research, with a theoretical and empirical basis, has an interdisciplinary nature involving management, marketing, information systems and communication. The main objective is to analyze the communication defects between IT professionals and users of their products and services, discussing some challenges to management and marketing.

This study addresses the communication between professionals of IT and its users in the corporate environment of Curitiba (Brazil). The underlying empirical approach examined responses from a sample of IT professionals (adults of both genders) with experience in the field and academic curriculum. It also examined responses from a sample of IT users (adults of both genders) who use platforms/systems/tools in that corporate environment. The questionnaires were available online, and we used the statistical software SPSS (version 17.0) for processing the collected data.

2. THEORETICAL FRAMEWORK

One deficiency was detected from previous researches (Wurman, 2005; Mattana *et.al.*, 2006; Kunsch, 2007; Cunha, 2009; Cassarro, 2011; Rezende, 2011; Silva, 2011): users are not always familiar with technology or able to express themselves, and the professional who deals directly with the public does not always have the communication ability to guide the user. The complete training of future, active professionals needs to make them capable to explore and adapt the full power at their disposal. This study aims to highlight the importance of guiding individuals that play different roles in society, both IT users and professionals, in order to have the ability to maintain clear and effective interpersonal communication.

There is awareness that there must be a closer approach between population and technology, in relation to both individual and corporative performance, and there are proactive actions from some government strategies (Takahashi, 2000; Warschauer, 2006). Educational, organizational and government systems have expressed concern regarding the expansion of the IT area, not to become an isolation factor but to incorporate interaction and appropriation of information in society. There are numerous projects working on the comparison between traditional fields of education and the IT field (Gonçalves et al., 2013).

Organizational intelligence and strategic alignment of IT resources with business strategies and plans are currently the issues for more success in an organization, either public or private. Thus, a firm's strategic marketing should be complementary to the information

systems planning (Rezende and Abreu, 2010; Polizelli and Ozaki, 2008). It is evident that there is a close relation between the concepts of business intelligence, relationship marketing, information systems planning and knowledge (Fernandes, 2013). There is a need for organizational intelligence to be exercised, and the management of data and information add value to the product or service offered, aiming to make the difference to customers.

Organizations need to provide quality in their products and services, maintain service excellence and be alert to changing market conditions. It is also essential that an accessible and transparent language exists in communication with customers, anticipating their wishes and needs. In organizational terms, this study intends to encourage some thinking and development of interventional projects that aim at solving or overcoming noise[1] in the communication process in the IT field. Some key issues for a successful management need to always be in vogue: communication skills, information understanding (an influent factor on reliability), etc.

Technological learning by professionals may bring benefits to management such as: complex projects' expansion; their own training (identification of weaknesses/strengths); interactivity or interpersonal communication (which is different in business and education fields); customer's understanding of machine/system's operation (and realizing the benefits from its adoption); and natural man-machine integration, which improves management due to easier decision making from significant time reduction in problem solving (Rios, 2006; Costa, 2007; Gaete, 2010; Hanson, 2010; Allameh *et al*., 2011; Ignatius *et al*., 2012, Sun and Hsu, 2012; Miwa and Terai, 2012; Partala and Kallinen, 2012).

The conquest of future loyalty to products/services requires that users understand the machine or system's operation and realize the benefits from its adoption to analyze if a certain technology is needed in their lives. In the digital world, *viral* marketing (also known as *word of mouth*) is very strong, such as a social network's discussion on a service; this form of marketing can be allied to satisfaction and trust (Giglio, 2010; Hanson, 2010; Matos, 2011; Liu, 2012). Thus, it is interesting to consider communication within different IT contexts. The spread of the internet ends up creating new options and, subsequently, a range of needs. The exploration of different users' profiles and distance-learning opportunities is just a small portion to be explored.

2.1 Research questions

Considering the objectives that were mentioned and the theoretical framework, these main research questions (RQ) were addressed:

RQ1- It is important to consider the user's knowledge in the IT field for a more efficient communication.

RQ2- The IT professionals are prepared, in terms of communication, to assist the users.

RQ3- It is important to build a screenplay (guide for conducting the approach to user) to capture the reality of each user.

RQ4- Problems tend to be solved when there is feedback from the user to the professional about the information system.

[1] Failure or undesirable disturbance in any communication process which may cause deviations or damages in the message.

3. METHODOLOGY

3.1 The questionnaire

This study addresses the communication between professionals of IT and its users in the corporate environment of Curitiba (Brazil). The underlying empirical approach examined responses from a sample of IT professionals (adults of both genders) with experience in the field and academic curriculum. It also examined responses from a sample of IT users (adults of both genders) who use platforms/systems/tools in that corporate environment.

The questionnaire, both for professionals and users, was divided into two parts. The first one gives information on the profile of each respondent. The profile variables include: gender, age, scholarship, charge/activity and action level. The second part is composed of 16 closed questions (both in the Professionals' questionnaire as well as in the Users' questionnaire) with a Likert response structure (1=totally disagree; 2=partially disagree; 3=partially agree; 4=totally agree). Not all the questions were used in the present work, as we worked only with the ones related with the research questions (RQ) formulated. The derived variables that are most related with this research are presented in the following tables:

Table 1. List of Variables from Professional's questionnaire

Variable number	Variable from Professional's questionnaire
P1	In assisting the user, no need to keep explaining him all the details of the intervention in the system
P4	English terms cannot always be translated as there is no equivalent in Portuguese and translation can distort meaning
P5	Must have user's feedback, related with system/computer and communication process, for the necessary improvement
P6	It is important to consider the user's knowledge with respect to IT
P7	Sometimes an expression is so basic that IT professional does not realize that user may not know it
P8	Each client/user requires a different assistance approach
P9	In IT professional's academic graduation there was training on customer service/assistance
P10	The IT professional knows much better user's needs than the user himself
P11	System's complexity should be reduced to facilitate user's understanding
P12	Some terms reflect the real speed of IT changes and may not be sufficiently clear to users
P13	The use of technical terms streamlines communication processes in the IT field
P15	Over time IT professional realizes the importance of having a clear communication with the user
P16	The more qualified IT professional is, less contact with the user he has

Source: Own elaboration

Table 2. List of Variables from User's questionnaire

Variable number	Variable from User's questionnaire
U1	By experience IT professional realizes user's needs despite he cannot explain them
U2	It is important to give feedback to IT professional concerning the system/computer and communication for the necessary adjustments
U4	Technology can be a source of benefits and job security
U6	Everyone should know IT well, not only the IT professionals
U11	The user strives to facilitate his interaction with the IT professional
U13	IT professional needs to consider user's reality in assisting him

Source: Own elaboration

3.2 Sampling procedures

The studied sample is composed of two sub-groups: one with IT professionals and the other with IT business users. Since it was not possible to be precise about the number of professionals in the city of Curitiba, who may be linked to companies or autonomous (a common situation in the IT field), or about the number of users, the procedure for unknown populations is recommended (Stevenson, 2001; Neufeld, 2009; Luchesa and Chaves, 2011):

$$n = \frac{z^2 p(1-p)}{e^2}$$

$$n = \frac{1{,}96^2 \times 0{,}5(1-0{,}5)}{0{,}05^2}$$

n≈384 cases

Where:
p= estimative for the statistic unit percentage that verifies the characteristic (usually, the most conservative value used is 0.5)
e= margin of error of the confidence interval
z= statistic value of confidence degree

The dimension of this defined sample implies 384 questionnaires, both for professionals and users. The questionnaire was published online, and an email with its link was sent to 500 IT professionals and 500 IT users, in order to obtain the necessary composition of the sample. We obtained 135 responses from professionals, equivalent to a 27.0% response rate (a response was then excluded due to some errors), and 108 responses from users, equivalent to a 21.6% response rate (a total of 243 cases). Although these rates seem to be low, it is important to refer to other experiences with electronic surveys that have already shown that this kind of research presents a response rate lower than 25% (Scornavacca Jr., Becker and Andraschko, 2001; Maier and Remus, 2002; Cohen, 2003; Graeml and Csillag, 2006; Antonelli and Santos; 2009; Silva, 2011).

Furthermore, the application of this research is restricted to Curitiba, unlike other studies that have a wider dissemination or a national level. Another aspect is that participation in the survey was completely voluntary; those who participated, after knowing the purpose, kindly accepted or did not accept the invitation. This was done in order to increase the probability of trustworthy answers, thereby increasing the reliability of the study. Also, the dimension of a sample must be at least four to five times greater than the total of variables (Malhotra, 2006). In this research, considering that the questionnaire has 16 objective questions plus 5 open ones (totaling 21 questions), the number of answers should be around 84 to 105. We obtained 108 from users and 135 from professionals, meaning that a valid number was obtained to meet the requirements.

This research intends to increase the experience and knowledge around this bounded, linguistic situation in which the researcher, based on some research questions, intensifies the analysis of the limits of this specific reality. These descriptive and exploratory researches are common when there is a concern with the practical actions of the researcher (Sanchez, 1999; Barquette and Chaoubah; 2007; Gil, 2008).

4. RESULTS

4.1 Sample characterization – IT professionals

Regarding age group, it is observed that younger people prevail in our sample, comprising 84.56% (44.85% up to 25 years old, and 39.71% from 26 to 35 years old), while only 15.44% are over 35 years old (12.50% from 36 to 45 years old, and 2.94% from 46 to 59 years old). There were no respondents aged 60 years or older. Regarding gender, it is observed that 77.21% of the 135 respondents are male, demonstrating that there is still a strong predominance of male professionals in the IT field, which confirms the information presented in the Green Book (*Livro Verde*) (Takahashi, 2000).

Intersecting information about post-graduation level and last year of scholarship, 46% of professionals that participated in the survey had completed or almost completed their graduation. Thus, among the 135 professionals, only 62 have post-graduation, which may reinforce that, in the IT field, even without completed graduation the professional is already inserted in the job market. This causes some questions to arise: Does this mean the professional is somehow immature in dealing with the user? Is there a trend of young people looking for post-graduation programs? Are post-graduates the older ones?

The prevalent charge or kind of activity among the respondent professionals is analyst (50.74%); this is followed by support/assistance (13.24%) and then supervisors (9.56%). The other significant portion (22.06%) is composed of professionals who work in diversified fields such as programming, development and management. According to their level of action, the predominance of operational professionals (61.94%) is noticeable, followed by those at the tactical level (20.90%) and strategic level (17.16%).

Table 3. Distribution of answers - Professionals

Variables	Distribution of answers
Professional's age:	
Up to 25 years	44,85%
From 26 to 35 years	39,71%
From 36 to 45 years	12,50%
From 46 to 59 years	2,94%
Over than 60 years	0%
Professional's gender:	
Male	77,21%
Female	22,79%
Professional's scholarship:	
Uncompleted graduation	26%
Graduation	23%
Specialization in progress	24%
Completed specialization	18%
Master's degree in progress	5%
Completed master's degree	4%
Doctorate in progress	0%
Completed doctorate	0%
Professional's charge/activity:	
Owner/partner	4,41%
Supervision/coordination	9,56%
Analyst	50,74%
Support/assistance	13,24%
Other	22,06%
Professional's action level:	
Operational	61,94%
Tactical	20,90%
Strategic	17,16%

Source: Own elaboration

4.2 Sample characterization – IT users

Regarding age group, respondent users are concentrated in two intermediate ranges: 39.81% in the group from 26 to 35 years old and 35.19% from 36 to 45 years old. We notice that, as with professionals, there were no respondents with an age over 60 years. Regarding gender, contrary to professionals, both men and women use IT similarly and had almost the same percentage: 49.07% were male and 50.93% female.

Table 4. Distribution of answers - Users

Variables	Distribution of answers
User's age:	
Up to 25 years	16,67%
From 26 to 35 years	39,81%
From 36 to 45 years	35,19%
From 46 to 59 years	8,33%
Over than 60 years	0%
User's gender:	
Male	49,07%
Female	50,93%
User's scholarship:	
High School	3,70%
Uncompleted graduation	21,30%
Completed graduation	14,81%
Uncompleted post-graduation	6,48%
Completed post-graduation	53,70%
User's action level:	
Operational	54,29%
Tactical	17,14%
Strategic	28,57%
User's main activity:	
University teaching, coordination of courses and projects	23,13%
Administrative assistance, secretary, public service	18,5%
Accounting, management, banking, taxes	9,26%
Advocacy, registry	8,32%
Administrative analysis, systems analysis	7,38%
University internship	5,56%
Industry, engineering	4,62%
Human resources	1,84%
Other[2]	21,39%

Source: Own elaboration

A feature we highlight in users is their level of education; at one extreme there is the group with complete post-graduation (53.70%), and at the other extreme there is the group with high school education (3.70%). As there was no obligatory orientation for disseminating the questionnaire, almost 75% of the respondent users, having at least completed graduation, indicated that scholarship level influences the adoption of IT as a work tool. Concerning their action level, it is observed that the majority of users belong to the operational level (54.29%), while the others are divided between tactical (17.14%) and strategic (28.57%) levels.

These users' main activities are distributed in 9 categories, from courses/projects coordination to administrative analysis and others. Categories included are either autonomous, such as lawyers and engineers, to technical support, such as teachers and supervisors. Responses emphasize that the highest percentage was concentrated in university teaching/coordination of courses and projects (23.13%), while the lowest was in human resources (1.84%). All of these individuals somehow use IT in their professional activities.

[2] Travel agency, marketing, sales, medicine, architecture, consultancy, etc.

4.3 Research questions verification

Average values and standard errors were used in order to verify the research questions proposed. Given the Likert response structure used in the questionnaire (1=totally disagree; 2=partially disagree; 3=partially agree; 4=totally agree) we can identify the average values indicating agreement (above 2.9) or disagreement (below 3.0). The consistency in the answers can be observed through the standard deviations.

In order to verify *RQ1- It is important to consider the user's knowledge in the IT field for a more efficient communication,* we used information from P6, P8, U1, U11 and U13.

Table 5. *RQ1* **testing**

	N	Average	Std. Dev.
P6 - It is important to consider the user's knowledge with respect to IT	135	3,56	,676
P8 - Each client/user requires a different assistance approach	135	3,69	,480
U1 - By experience IT professional realizes user's needs despite he cannot explain them	108	2,27	,903
U11 - The user strives to facilitate his interaction with the IT professional	108	3,43	,726
U13 - IT professional needs to consider user's reality in assisting him	108	3,83	,399

Source: Own elaboration

These results show that the professional agrees with both the importance of considering a user's knowledge in IT and the need of changing the approach according to each user. At the same time, users strive to facilitate interaction with the professional who needs to consider the user's reality. Based on their experiences, users do not agree that the IT professional realizes a user's needs without an explanation.

In order to verify *RQ2 - The IT professionals are prepared, in terms of communication, to assist the users,* we used information from P1, P9 and P15.

Table 6. *RQ2* **testing**

	N	Average	Std. Dev.
P1 - In assisting the user, no need to keep explaining him all the details of the intervention in the system	135	2,56	,843
P9 - In IT professional's academic graduation there was training on customer service/assistance	135	2,39	1,072
P15 - Over time IT professional realizes the importance of having a clear communication with the user	135	3,88	,324

Source: Own elaboration

This table shows that IT professionals do not agree with either the lack of need for explaining all the details to users or the existence of training on customer assistance in their academic graduation. Over time, professionals realize the importance of having clear communication with IT users.

In order to verify *RQ3 - It is important to build a screenplay (guide for conducting the approach to user) to capture the reality of each user,* we used information from P5 and P8.

Table 7. *RQ3* **testing**

	N	Average	Std. Dev.
P5 - Must have user's feedback, related with system/computer and communication process, for the necessary improvement	135	3,77	,422
P8 - Each client/user requires a different assistance approach	135	3,69	,480

Source: Own elaboration

These results acknowledge that IT professionals agree with both having users' feedback related with the system and communication processes as well as the consequent need of having different assistance approaches.

In order to verify *RQ4 - Problems tend to be solved when there is feedback from the user to the professional about the information system,* we used information from P5, P11 and U2.

Table 8. *RQ4* **testing**

	N	Average	Std. Dev.
P5 - Must have user's feedback, related with system/computer and communication process, for the necessary improvement	135	3,77	,422
P11 - System's complexity should be reduced to facilitate user's understanding	135	3,41	,892
U2 - It is important to give feedback to IT professional concerning the system/ computer and communication for the necessary adjustments	108	3,65	,517

Source: Own elaboration

According to these results and the fact that IT professionals agree with both the need of having users' feedback and reducing the system's complexity, users agree with the importance of giving their feedback to professionals concerning the system and communication processes.

4.4 Summary of results

From the research questions' verification, through analyzing the answers obtained in both questionnaires, the results about their confirmations or discards are summarized in the following table:

Table 9. Research questions' summary

Research questions (RQ)	Results
RQ1- It is important to consider the user's knowledge in IT field for a more efficient communication	Confirmed: once the majority of respondent professionals agree with the need to consider the user's knowledge in order to turn communication more efficient. This positioning is more theoretical[3] than practical (it reflects the problematics of this research)
RQ2- The IT professionals are prepared, in terms of communication, to assist the users	Discarded: as many respondent professionals start acting without sufficient training or preparation. The awareness of this issue occurs as time passes, what may undermine professional's performance
RQ3- It is important to build a screenplay (guide for conducting the approach to user) to capture the reality of each user	Confirmed: as respondent professionals consider important the adequate approach to know customer needs. Once more, a theoretical positioning is observed reinforcing this problematics
RQ4- Problems tend to be solved when there is feedback from the user to the professional about the information system	Confirmed: both respondent users confirmed the importance of giving their feedback and professionals recognize this importance

Source: Own elaboration

Regarding the fulfillment of the overall objective of this research, verification occurs of several management and marketing impacts from communication issues between IT professionals and users of their platforms/services. Those impacts are systematized below, keeping in mind the research questions (RQ) analyzed.

The confirmation of RQ1 has implications on firms and an IT professional's career management, as the professional needs to gather information about the user in order to enhance communication efficiency and, consequently, reach his goals.

[3] Related with the "agree" kind of answers.

The discarding of RQ2 has serious implications on marketing, due to the professional's unpreparedness in approach, relation and positioning strategies. There are further implications on his/her career management as he/she lacks guidance in their management, thereby weakening the relationship with the customer.

The confirmation of RQ3 has positive implications on an IT professional's career management and, consequently, on marketing because one of the strategies of a customer's approach in contemplating his/her reality and gathering attendance issues should be a screenplay. Although IT professionals consider it important to be prepared for a customer's approach, the obtained answers show that they do not use this strategy perhaps due to a lack of orientation in their own graduation process. This entails negative impacts, both for career management and personal marketing, because the professional's performance and image are affected.

The confirmation of RQ4 has management implications as feedback from the user gives the professional the necessary guidance. Therefore, it is required that IT professionals are determinate in searching for feedback to better know how to manage the received information in order to plan strategies for future contacts.

Thus, the importance of clear and efficient communication processes between IT professionals and users is confirmed since several management and marketing implications are evidenced, in both organizational and personal levels.

5. CONCLUSION

The obtained data acknowledge that IT professionals communicate using terms that hinder understanding by users. Results lead to the perception of a need for formal training and screenplay by IT professionals to serve customers, manage their careers and assist with technology on behalf of users. Professionals must be clear with users to create confidence, in order to improve business management practice. From the sample of users it was evident that they consider technology as a basic support. They expect professionals to share and explain to them their actions toward the machine or system, as well as to listen to what they need.

We can perceive that the manner of how the IT professional communicates with the user interferes with management because effective decisions cannot be made without clear information. The goals of both sides must be attained to get productive results for the organization. It is important that IT professionals incentivize effective communication processes with users because their performance tends to be autonomous, and they must manage their own career and care for personal marketing.

It is a challenge to create an effective communication process using IT technical language and search for management tools capable of bridging both sides: the vision of results by the customer and enterprise marketing goals with the objectives of IT professionals. The company that stands out for its efficient customer service and clear communication will certainly have more competitive elements than its competitors.

Each time, it becomes more necessary to create or explore a strength that may become the differential over competitors. Cultural adequacy may take years to happen, so persistence is required. The obtained results show that IT professionals usually act by intuition, without formalization or orientation that gives them more support and attendance parameters. Apparently, this behavior occurs without intention; in this way, many have worked it out by chance, but others went wrong without even knowing exactly where the problem lay.

In the context of change, the elementary principles oriented to the market must be in harmony with concepts and working methods that emphasize the ability of dealing with

social and cultural differences. Thus, if the techniques and marketing tools are designed to achieve business goals, they must be used to promote the minimization of misunderstanding concepts. A policy oriented to strategic communication makes the access to new markets easier, providing transparency and enabling vital partnership creation.

In order to survive in this highly competitive society, both people and companies rely on information. Thus, opportune and personalized information is essential for situational knowledge and analysis, intelligent planning and decision-making. This research will have fulfilled a role if at least a portion of IT professionals become aware about the relevance of effective communication in the vitality of an organization or professional career. There are still gaps whose resolution depends on a commitment between *awareness* and *action*. Each professional must find his own way of working with the communication process and, then, the personal marketing. These professionals must use their technical knowledge, personal experience and common sense to develop values such as understanding and contribution to a business vision.

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