
Communication practices in global product development projects of Brazilian multinational firms

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RESUMO

As práticas de comunicação em projetos globais de desenvolvimento de produtos em multinacionais brasileiras

O objetivo da investigação aqui relatada foi mapear as práticas de comunicação aplicadas aos projetos globais de desenvolvimento de produtos de empresas multinacionais brasileiras e analisar se essas práticas variam de acordo com algumas características dos projetos. Trata-se de um estudo de natureza exploratória, cujo método de pesquisa foi o estudo de casos múltiplos. Os resultados permitiram verificar que a frequência da comunicação nos projetos globais diminui com a distância, o que dificulta o controle e a coordenação das equipes. No entanto, por si só a distância, embora imponha desafios adicionais, não causa necessariamente problemas de comunicação, pois pode ser contornada pelo apoio das ferramentas eletrônicas de comunicação. O estudo permitiu concluir, também, que o uso das práticas de comunicação, bem como a importância dada a elas variam em função de algumas características dos projetos, incluindo o tipo de projeto, os estágios do ciclo de vida, o nível de complexidade e os arranjos integrativos utilizados no desenvolvimento dos produtos. Apesar de ter sido possível identificar tais variações, observou-se que as práticas não ocorrem de forma padronizada nos projetos; ao contrário, são desenvolvidas de maneira improvisada e circunstancial e não contam com um planejamento específico no início do projeto.

Palavras-chave: projetos globais de desenvolvimento de produtos, multinacionais brasileiras, práticas de comunicação.

1. INTRODUCTION

Driven by the corporate internationalization process, new product development projects have been expanding their geographic boundaries over the

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past few years, due, above all, to their making the best of the competitive advantages provided by each country. In this context, product development in multinational companies takes place in several facilities in different countries, instead of being developed entirely in a single unit of the corporation. As a result, the product development process becomes global, because it involves geographically dispersed teams, and the products developed in this process usually target the global market.

Despite all the inherent advantages of the internationalization of research and development activities, the process is fraught with difficulties. Among these, we may stress the coordination and control costs of geographically dispersed activities – which increase with decentralization – and communication, which is hindered and decreased among globally dispersed teams (ALLEN, 2007; CHIESA, 1995; HERBSLEB and MOCKUS, 2003).

Previous studies on global product development projects indicate that effectiveness and efficacy in communication is a prerequisite for the success of these endeavors (MOENAERT *et al.*, 2000). Other studies conclude that many of the problems which lead to project failure come from insufficient communication between team members (ALLEN, 2007; MOENAERT *et al.*, 2000; SOSA *et al.*, 2002), and, when it comes to projects developed by globally dispersed teams, the lack of communication and trust can be one of the leading factors of their failure (PINTO and PINTO, 1990).

In this context, global projects are subject to a paradox; if, on the one hand, they supply dynamic results as required by the market by speeding the innovation process through the parallel efforts of several facilities working simultaneously, on the other hand they create significant management challenges that are inherent to geographically dispersed teams. These challenges – caused by difficulties in coordination, control and communication, among other factors – can ultimately be responsible for a loss of speed in development (KELLER, 1986; HERBSLEB and MOCKUS, 2003).

Although the literature considers communication to be one of the main aspects of project management (PMI, 2004), evidence suggests that, in practice, this aspect is neither fully appreciated nor mastered by project managers, particularly when it comes to global projects. Based on this finding, we defined the following research objectives: identifying which communications practices are used most often in and considered most important to global product development projects in Brazilian multinational corporations and assess whether communication practices vary according to the type, life cycle stages, complexity, and integrative arrangements used in the product development process. Communication practices are defined as activities in which communication plays a central role and which are carried out in a similar manner across projects at least a few times (PAASIVAARA, 2005).

In order to meet these objectives, we will begin by presenting the results of a review of the literature on the main aspects

of the management of intra-firm global product development projects, with an emphasis on the integrative arrangements employed in these projects and existing communication practices, which were summarized into 20 practices for the purpose of this study. We then present some characteristics of our choice of study design and describe its underlying methodological procedures, which led to our choice of a three-company sample composed of Brazilian multinationals. The unit of analysis for each company consisted of two global product development projects. This discussion of our methods is followed by a presentation of collected data and an analysis of communication practices employed by the companies, the importance ascribed to them, and the variations they undergo as the result of certain situations. Finally, we present our conclusions and make a few recommendations.

2. THEORETICAL FRAMEWORK

2.1. Global projects

Product projects encompass research projects and development projects, and are distinguished from other types – services and continuous improvement, in the classification suggested by Cleland and Ireland (2007) – especially by the uncertainty attached to them. In addition to traditional product projects, there are global projects, also known in the literature as international projects. Cleland and Ireland (2007) define global projects as those which cross national borders, work with teams from several organizations and countries, and present challenges concerning customs, cultures and business practices brought about by this crossing of borders. Such global projects offer advantages and disadvantages, which must be analyzed and taken into consideration as the project is planned. Disadvantages can be reduced through the use of specific management techniques and intensive deployment of information technology (BOUTELLIER *et al.*, 1998).

The body of knowledge on project management can be organized according to three main dimensions: project life cycle – the phases between its beginning and end; management process groups – conception, planning, execution, monitoring and control, and termination; and project management knowledge areas – integration, scope, deadline, costs, quality, human resources, communications, risks and hiring (PMI, 2004). Communication is pointed out as one of the main challenges faced by global project management, as, even between nations in which the same language is spoken, there can be significant differences in word usage and technical terminology (BOUTELLIER *et al.*, 1998; CLELAND and IRELAND, 2007).

Many aspects of the structuring and management of product development projects may influence, positively or negatively, the manner in which the flow of information is

shared between teams. According to Barczak and Wilemon (1991), De Meyer (1991), Morelli, Eppinger and Gulati (1995), and Grinter, Herbsleb and Perry (1999), communication in product development projects (PDPs) can be influenced by the content of development (type and complexity of the research and development (R&D) project) and the organizational design where the projects are inserted as well. According to Chiesa (2000), communication is influenced by the projects life cycle stages and to Gupta, Raj and Wilemon (1986) and Koufteros, Vonderembse and Doll (2002), communication may be influenced by the integrative arrangements of projects, which are defined as the practices that foster the bringing together of project members and contribute to the adequate flow of information exchange.

Over the following topics, these influences will be analyzed in detail.

2.2. Project typologies and communication needs

Of the many PDP classification typologies that have been proposed, one of the most widely used is certainly that of Clark and Wheelwright (1993). According to these authors, one of the most useful ways to classify development projects is based on the degree of innovation they introduce. In increasing order of innovation, Clark and Wheelwright classify projects into derivative, platform, breakthrough, or R&D. This classification is important to the present study as, according to Barczak and Wilemon (1991), task characteristics influence project communication patterns; namely, the more unique and innovative the nature of a project, the greater the need for communication. In addition to project type, another factor that seems to influence communication practices is project phase or stage. Chiesa (2000) maintains that the interaction between dispersed teams changes according to project phase (conception, definition, development, and transfer of project result), which implies that each phase demands a different type and/or intensity of communication.

Complexity has also been mentioned in the literature as a determining factor of project communication practices. This correlation is based on the premise that PDPs are confusing, uncertain, unclear, and may involve different interpretations of the same theme (EISENHARDT and TABRIZI, 1995); based on this perspective, the greater the complexity of a project, the greater the level of uncertainty and error inherent to it. Uncertainty is defined as “the lack of critical and stable information” and error is defined as ambiguity, namely, the existence of multiple interpretations for the same organizational situation (DAFT and LENGEL, 1986). Consequently, tasks involving a high degree of uncertainty demand a far greater exchange of information during their execution than do low-uncertainty tasks (DAFT and LENGEL, 1986; HERBSLEB and MOCKUS, 2003; LOCH and TERWIESCH, 1998; KOUFTEROS, VONDEREMBSE and DOLL, 2002).

2.3. Integrative arrangements employed in global product development projects and their influence on interaction among dispersed teams

Assuming that global product development projects (GPDPs) deal with uncertainty and error in complexity and features as an inherent characteristic, one line of research in the current literature attempts to recommend ways of reducing the negative effects of these adverse conditions, as follows.

Gupta, Raj and Wilemon (1986) explain that the need for reducing uncertainty in the development process increases the need for integrated product development. Koufteros, Vonderembse and Doll (2002) find that, in order to deal with the challenges of uncertain and equivocal environments, companies adopt a variety of integrative development practices, such as multifunctional product development teams, concurrent engineering, “heavyweight product development managers” (highly autonomous managers), and information and communication technology usage. These integrative actions help bring members together and increase the flow of information within the project, contributing to the sharing of knowledge, to the resolution of cross-functional conflict, and to obtaining a mutual understanding of task development (GUPTA, RAJ and WILEMON, 1986). Other authors add modular architecture (HERBSLEB and MOCKUS, 2003), familiarity among team members and with tasks (ESPINOSA *et al.*, 2007; HARRISON *et al.*, 2003), and the design approach used, such as the **Design Structure Matrix** (DSM) (SOSA, EPPINGER and ROWLES, 2007), to the list of integrative practices.

Table 1 shows a summary of the approaches used to integrate global project development (except for multifunctional teams, as multitasking is understood to be an essential condition in all current development projects) and their implications for communication among dispersed teams.

2.4. Communication in intra-firm GPDPs

According to De Meyer (1991), one of the main productivity issues in R&D activities consists of encouraging communication among researchers. This becomes even more difficult when the R&D structure is spread across various countries (DE MEYER, 1991).

The evidence suggests that communication and collaboration decline as the distance between offices increases. Allen (1977; 2007) found that the distance between teams strongly reduced the likelihood of communication. The author concluded that the likelihood of peer communication decreases to an asymptotic level after the first 50 meters of physical separation. Several later studies have confirmed this result, such as Van den Bulte and Moenaert (1998) and Herbsleb and Mockus (2003), for instance.

Considering that geographic distance hinders communication, many studies in the GPDP literature have focused on

Table 1

Global Project Integration Practices and Their Implications for Communication Among Dispersed Teams

Integrative Practice	Implications for Global Development	Implications for Communication Among Dispersed Teams
Concurrent approach	Despite the difficulty of implementing it in the global project environment, it can provide major advantages (ABDALLA, 1999).	Parallel activities imply increased communication among the members involved (CLARK and FUJIMOTO, 1991).
Modular approach	Reduces interdependence of activities among dispersed units conducting global projects (HERBSLEB and MOCKUS, 2003).	Reduces the need for communication among units and facilitates project coordination (HERBSLEB and MOCKUS, 2003).
Project leader autonomy	Heavyweight managers – those with greater autonomy and coordination responsibilities (CLARK and WHEELWRIGHT, 1993) – have a positive effect on the integration of remote units (KOUFTEROS, VONDEREMBSE and DOLL, 2002).	Heavyweight managers are integrators, communicate better and more directly with top management, have more experience in project planning, and consequently find it easier to reduce error and uncertainty (KOUFTEROS, VONDEREMBSE and DOLL, 2002).
Familiarity	Familiarity helps reduce the negative effects caused by the geographic dispersion of team members (ESPINOSA <i>et al.</i> , 2007).	Familiarity produces information flows that are more synchronized and firmly established (HARRISON <i>et al.</i> , 2003).
Use of information and communication technologies	Information and communication technology is a basic condition for the feasibility of joint work across different locations (KOUFTEROS, VONDEREMBSE and DOLL, 2002).	Provides a variety of channels that may be applied according to message content, and facilitates project coordination (KOUFTEROS, VONDEREMBSE and DOLL, 2002).
DSM use	A sophisticated project management tool that brings several benefits, especially in large projects that involve several areas and activities.	Maps out the critical points of inter-area communication in order to make communication more effective and avoid communication-related faults (SOSA, EPPINGER and ROWLES, 2007).

communication, in an attempt to find inputs that minimize its difficulties and encourage a culture of information sharing between geographically dispersed units (POWELL, PICCOLI and IVES, 2004). Within this context, all studies performed thus far may be divided into a few dimensions. The first major dimension concerns recognition of the difficulties engendered by dispersed communication. The second dimension concerns the need to understand the specific characteristics and applications of formal and informal communication, both of which are necessary for good project communication. Finally, each type of message has distinct requirements, such as richness, volume, quality, or confidentiality of the information conveyed, in order to provide a minimum guarantee that this information will be conveyed in an efficient and effective way.

Most authors note that, in order to achieve effective communication, one must plan communications from the very start. Accordingly, the Project Management Institute (PMI) recommends that communications planning be an integral part of the overall project plan. This, in turn, should contain data on all information stakeholders, which type of infor-

mation should be sent to each stakeholder, how regularly information should be sent, and how it should be distributed (PMI, 2004).

Based on the literature, we conclude that, although the importance of electronic channels is recognized, depending on the type of information that is to be shared, no electronic means of communication is a substitute for face-to-face meetings between teams. Generally speaking, the use of information technology is vital for dispersed R&D teams, but it is not enough to ensure project success. Other organizational components are required, such as face-to-face meetings at the early stages of the project and activities to build trust among team members (BOUTELLIER *et al.*, 1998).

2.4.1. Communication practices in GDPDs

Understanding the communication process in GDPDs has been acknowledged as a key element of improving their performance. It bears stressing that, although the theme of **project communication** has received vast attention in the

literature, it does not yet appear to play a core role in practical project management. Paasivaara (2005) found that the companies in her sample rarely employed communication practices in a similar manner for all projects. Instead, practices were improvised (through trial and error) and applied in a specific way for each project. Therefore, this study initially surveyed the main communication practices reported in the literature (as found through field studies) and combined them into 20 practices, which were further classified according to the different types of technical communication (ALLEN, 2007; MORELLI, EPPINGER and GULATI, 1995). These practices are shown in table 2.

All these practices focus on increasing and facilitating distance communication. Their objectives gravitate around encouraging people to communicate with one another and initiate contact. Furthermore, they are all related to some specific communication need, feature directed communication channels, and have inherent pros and cons. Practices involving the displacement of employees between dispersed facilities, for instance, are highly beneficial to projects, especially if they are carried out at the start of the project, as insistently emphasized by the literature. However, their high cost sometimes jeopardizes their feasibility.

3. METHODOLOGICAL PROCEDURES

Our field research focused on communication practices used in companies that had to meet the following criteria: be Brazilian multinational corporations; carry out global product development project; and carry out intra-firm project development. The present study is exploratory in nature, as organizational communication – and global project communication in particular – is a complex and recent phenomenon, and its understanding therefore requires in-depth information (EISENHARDT and GRAEBNER, 2007; YIN, 2005).

We chose a qualitative approach, since the number of publications on our study universe (Brazilian multinational corporations) is still limited. Our research method of choice was the multiple case study, and the unit of analysis consisted of global product development projects conducted by the companies. The choice of projects as units of analysis was based on several studies of long-distance communication practices, which have established this approach (McDONOUGH, KAHN and GRIFFIN, 1999; HERBSLEB and MOCKUS, 2003).

Interviews were conducted with members of multifunctional product development teams, specifically, members of Brazilian

Table 2

Communication Practices in GDPs Grouped by Type of Technical Communication

Types of Communication	Communication Practices
Coordination	<ol style="list-style-type: none"> 1. Appointment of a “chief communication coordinator”. 2. Development of a communication plan at the start of the project. 3. Implementation of formal communications (paperwork and procedures). 4. Implementation of a fast, direct, personal channel for communication between project managers and stakeholders for clarification of doubts and problem solving. 5. Kick-off meeting. 6. Regular project follow-up meetings (face-to-face or virtual). 7. Face-to-face problem-solving meetings. 8. Project performance reports. 9. Wrap-up / “lessons learned” meeting.
Knowledge	<ol style="list-style-type: none"> 10. Team co-location during early phases of the project. 11. Visitation of remote units. 12. Team co-location for product testing and integration. 13. Temporary transfer of employees between units. 14. Discussion forums. 15. Use of a database to manage changes and mistakes. 16. Checks to ensure understanding of project goals and instructions. 17. Regular feedback.
Creativity	<ol style="list-style-type: none"> 18. Virtual introduction of members at the start of the project. 19. Face-to-face introduction of members at the start of the project. 20. Socialization among members so they will get to know one another and establish trust and team spirit.

project development teams who are in contact with employees of other functions or departments in overseas units of the company. All respondents but one had been with their respective companies for over 15 years. Data collection was conducted by means of two instruments: a set of open-ended questions designed to provide an understanding of the organizational environment in which projects are developed; and a questionnaire composed of closed-ended questions with two sets of statements, through which respondents were asked to assess the use and importance of the 20 global project communication practices chosen to be the study's units of analysis. Analysis was conducted through case description (YIN, 2005), categorizing cases by the study's core themes and contrasting them with the literature. This was followed by comparative analysis of each case, again comparing them to the literature.

Based on the above, we selected three companies that met predefined selection criteria: EMBRACO, SMAR, and WEG. We now present a brief summary of each company's activity.

• EMBRACO

Founded in 1971, EMBRACO is the world leader in hermetic compressors, with an estimated market share of 22%. The company has an annual production capacity of approximately 24 million units, employs over 10,000 people worldwide, invests up to 3% of its net earnings in R&D, exports to several countries, and operates production plants in Brazil, Italy, Slovakia, and China, in addition to business units in the United States and Mexico (EMBRACO, 2008).

• SMAR

Founded in 1974, SMAR is currently one of the world's leading providers of industrial automation technology, with units in seven countries and two R&D labs in the United States. Over one-third of the company's output is sold on the international market (SMAR, 2008). SMAR has around 1,200 employees, invests 13% of its earnings in R&D, and holds 20 patents in the United States (with 23 more pending) (STEFANOVITZ, 2006).

• WEG

Founded in 1961, WEG is currently one of the world's five largest manufacturers of electric motors, and a sector leader in technology. The company, which is present in over 100 countries, focuses on two sectors: industrial electrical and electronic systems generation, transmission, and distribution of electrical power. It employs around 20,000 people and invests 3.5% of its earnings in R&D (WEG, 2008).

"The core motivation of this study arose from the perception that one of the main challenges faced by global project management concerns the difficulty of long-distance communication."

Table 3 presents a summary of the companies that make up the study sample and their overseas R&D structures.

We analyzed two projects from each company. For ease of reporting, each project was named as follows: EMBRACO projects – E1 and E2; SMAR projects – S1 and S2; WEG projects – W1 and W2. The criteria used to choose the projects were: projects whose scope included the development of new products; projects developed in conjunction with Brazilian and overseas teams; and projects developed by their own employees. The coordinator of each project was interviewed; in addition to questions concerning the general aspects of the projects, they answered a questionnaire about the 20 communication practices chosen from our review of the literature on the theme, and assigned scores for use of these practices and the importance ascribed to them.

4. DATA ANALYSIS

As noted, six GPDs were analyzed – two from each target company. Table 4 presents a summary of the main features of these projects. Initially, cases were analyzed individually and categorized according to the core themes of the study; then, again based on these themes, the results of each company and each project were compared with one another.

Table 3

Overseas Production Plants and R&D Structure

Company	Plants in Brazil	Overseas Plants	Overseas R&D
EMBRACO	Joinville (3 plants) and Itaiópolis	Slovakia, Italy, and China	All factories have a local R&D structure
SMAR	Sertãozinho (2 plants)	Two (both in the United States)	Two R&D structures in the United States
WEG	Jaraguá do Sul (2 plants), Guaramirim, Blumenau, São Bernardo do Campo, Manaus, Itajaí	Argentina, Portugal, Mexico, and China	R&D structures in Portugal, Mexico, and China

Table 4

Basic Characteristics of the Studied Projects

Aspects Assessed	EMBRACO		SMAR		WEG	
	E1	E2	S1	S2	W1	W2
Global distribution	Brazil / China / Italy	Brazil / China	Brazil / United States	Brazil / United States	Brazil / Portugal	Brazil / Portugal
Project coordination	Brazil	Brazil	United States	United States	Portugal	Brazil
Project type	New platform	Derivative – improvement of existing line	Derivative – product line update	Derivative – addition of new features	New platform	Derivative – new product line on existing platform
Project duration	2 years	8 months	2 years	7 months	1 year	1 year
Degree of technological complexity	High	Mid	Mid	Low	High	Mid
Number of people involved, part time	—	—	11	4	15	8
Number of people involved, full-time	50	8	—	—	—	—
Areas involved	R&D, Manufacturing, Engineering (process/product), Quality, Lab, Marketing/Sales, Materials, HR	R&D, Manufacturing, Engineering (process/product), Marketing/Sales, Materials, Lab	Engineering, Application, Tech Support, Marketing, Sales	Engineering, Manufacturing, Market	R&D, Marketing/Sales, Development, Manufacturing, Processes, and Tooling	Engineering, Quality Control, Materials, Marketing/Sales
Manufacture of new product	China	China	Brazil / United States	Brazil / United States	Portugal	Portugal / Brazil
Division of labor	Parallel/ Sequential	Parallel/ Sequential	Modular	Modular	Parallel/ Sequential	Parallel/ Sequential
Intensity of interaction with external team	High	Low	Mid	Low	Mid	Low
Cooperation difficulties	Language, time zone	Language, time zone	Formal mechanism support	Not reported	Apportioning priorities among units	Not reported

Figure 1 shows a graphical representation of the average results ascribed to each communication practice. **Degree of use** is plotted along the horizontal axis; **importance ascribed**, on the vertical. According to respondents, the two most commonly employed practices in the analyzed projects were: implementation of communication channel for questions and problem solving, kick-off meeting, and implementation of formal communications. All these practices are geared at project coordination (ALLEN, 2007). This shows that the practices considered most important were also those most frequently

employed, except for **regular feedback**, which, despite being ranked among the top five most important practices, was not reported among those most employed in the projects studied. The least employed practices (seen on the lower left-hand side of the graph) were discussion forums and communication plan.

Figure 2 shows a graphical representation of the overall values of each project, both for **Degree of use** and **Importance ascribed**. It also permits evaluation of which projects, on average, present more coherence between **degree of use** and **importance ascribed**. Analysis of the results shows that, in all

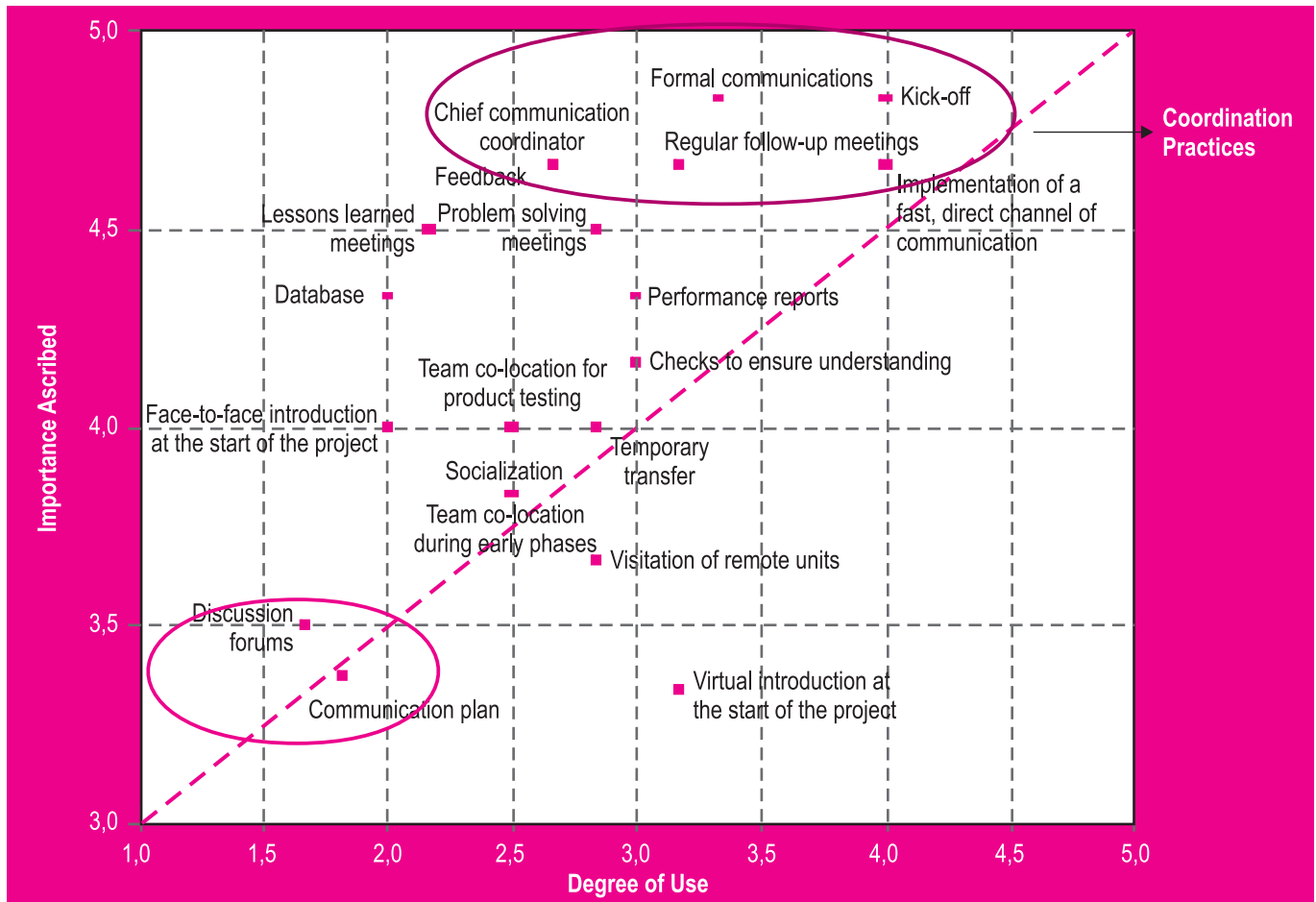


Figure 1: Comparison Between Degree of Use and Importance Ascribed for Each Communication Practice

of the studied projects, the importance ascribed to practices is, on average, higher than the actual extent of their everyday use. Given certain methodological restrictions regarding a comparison between averages, it is important to point out that all respondents noted a possible imbalance between the frequency with which they use communication practices in day-to-day business and the frequency with which they believe these practices should be used.

From Figure 2, we may conclude that projects E1, E2, and W1 had the highest **degree of use** and also the most **importance** in the respondents' view. Such projects are of the platform type, which require time and higher investments and involve higher management and technological complexity compared to derivative projects (CLARK and WHEELWRIGHT, 1993). These are the projects which dealt with a higher level of complexity concerning the factors quantity of functional areas involved and intensity of interaction between the functional areas (according to Sbragia, 1982). These projects were also those that involved the largest numbers of people and longest duration (degree of complexity as defined by Cooper, Edgett and Keeinschmidt, 1998). Furthermore, they are considered to

be the most complex regarding time zone differences, geographic distance and sociocultural differences (complexity according to Herbsleb, 2007)

Such relations seem to indicate a positive relationship between project type and complexity and the importance and use of communication practices, as previously reported in the literature. In this case, the more innovative the project, the greater the communication flow required for its execution.

4.1. Considerations on communication practices used in GPDPs

Data collected at the three companies provided some evidence of communication practices employed in global product development projects, namely:

- Results showed that, in most cases, companies do not clearly plan communications at the beginning of a project. Consequently, instead of following a pattern of use, communication practices are employed circumstantially, that is, they vary according to the conditions surrounding each project. In most cases, there was no list of commonly employed practices for

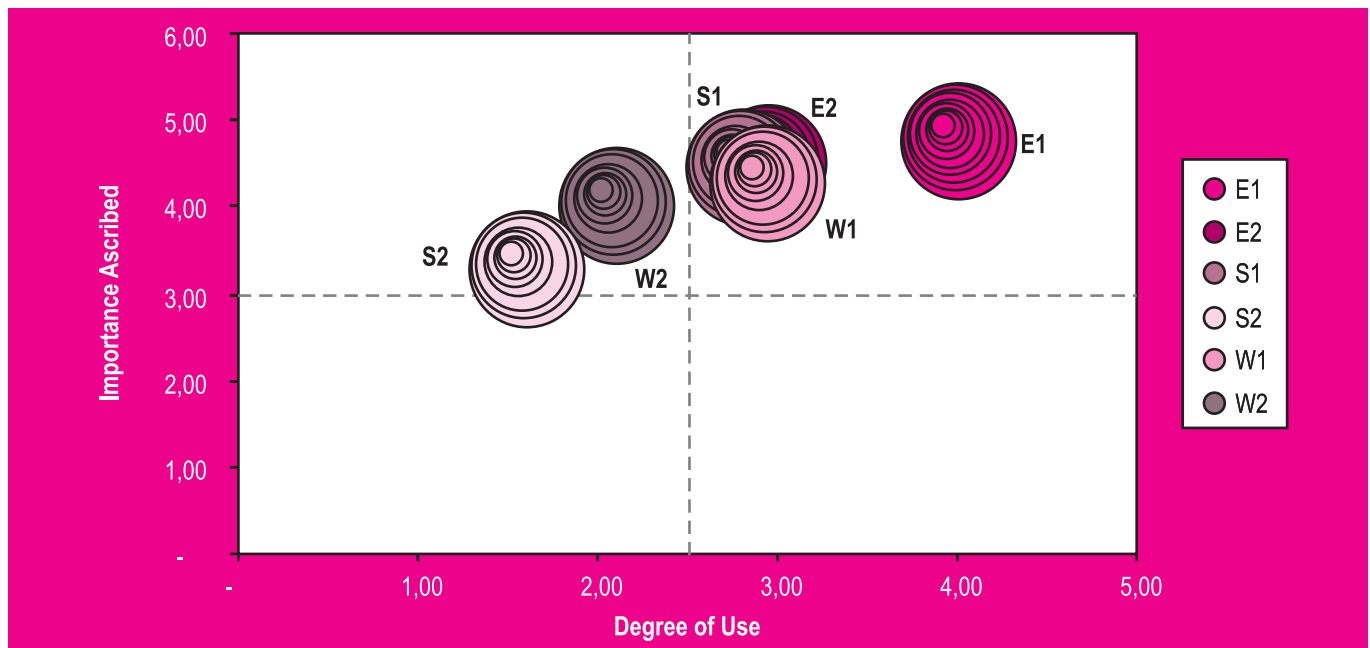


Figure 2: Comparison Between Degree of Use and Importance Ascribed by Project – Synthetic Analysis

the studied projects. This confirms the conclusions of Paasi-vaara (2005), who obtained a similar result. Not only is communication planning not carried out in any formal way, it was considered unimportant by respondents.

- Despite the circumstantial use of communication practices, we did find a few aspects that may influence the way in which they are carried out. The use of some practices appears to be conditioned to the management model companies apply to their projects. Regardless of the company, we found certain similarities in the use of practices in projects of similar scope and size.
- Despite the existence of informal practices, project leaders report placing greater emphasis on the use and improvement of formal communication practices. The growing importance the literature claims leaders afford to informal practices (HERBSLEB and GRINTER, 1999; JOHNSON *et al.*, 1994) was not found in practice.
- The **speaker profile** aspect was reported as either facilitating or hampering the communication process in projects in all companies. It bears noting that such an aspect was not identified anywhere in our review of the literature.
- The five practices assigned the highest **degree of use** in the studied projects were, on the multiple classification scale (1 to 5) proposed by Cooper and Schindler (2003):
 - Implementation of communication channel for questions and problem solving (4.0).

- Kick-off meeting (4.0).
- Implementation of formal communications (paperwork and procedures) (3.3).
- Regular project follow-up meetings (3.2).
- Virtual introduction of members at start of project (3.2).

Regarding the two most commonly employed practices, we found that the **communication channel for questions and problem solving** was naturally mediated by the project leader; the **kick-off meeting** practice, when not done in person, was at least conducted virtually; this is in accordance with the literature, which notes that kick-off meetings are necessary for clarification of project goals and responsibilities (BARCZAK and McDONOUGH III, 2003; BOUTELLIER *et al.*, 1998; McDONOUGH III, KAHN and GRIFFIN, 1999).

- The five practices with the highest **importance ascribed** were, again on the scale proposed by Cooper and Schindler (2003):
 - Implementation of formal communications (paperwork and procedures) (4.8).
 - Kick-off meeting (4.8).
 - Implementation of communication channel for questions and problem solving (4.7).
 - Regular project follow-up meetings (4.7).
 - Regular feedback (4.7).

As previously noted, in general, practices considered most important were also those most frequently employed, although they ranked differently, and importance and use values were discrepant. **Implementation of formal commu-**

nications was chosen as the most important practice, in agreement with project leaders' accounts (as shown in item third). **Regular feedback** was considered an important practice; nonetheless, it was not employed very frequently in the projects we studied – it ranked 11th by **degree of use**. This suggests that little information is exchanged on project progress, and that project leaders want more transparency on project status.

4.2. Project characteristics influencing communication practices

According to data collected at the three companies in our sample, the use of communication practices may be conditioned to project type, life cycle stages, complexity, and some integrative arrangements employed in project management, including the approach to division of tasks (concurrent or modular), familiarity with tasks and among team members, leader autonomy, and the use of communication support tools. These aspects are detailed below.

- Project type appears to influence the intensity with which communication practices are carried out. In other words, projects that involved the development of new product platforms, according to the definition proposed by Clark and Wheelwright (1993) were those whose practices showed the highest **degree of use**; namely, EMBRACO project E1 and WEG project W1.
- Some project stages, particularly start (conception) and finish (transfer of results) as defined by Chiesa (2000), were found to influence communication practices in the three companies in our sample. Project stages influenced not only the intensity of communication, but also the type of communication practices employed. In some stages, such as project conception and transfer of project results to manufacturing, electronic communication practices were not enough – personal encounters, or even the temporary transfer of team members, were required.
- Of the projects in our sample, those involving the greatest uncertainty – and considered to be most complex – were found to employ communication practices most intensively, as previously reported in the literature (BARCZAK and WILEMON, 1991). Indeed, the inherent complexity of projects – defined in the literature by projects involving teams highly dispersed by physical distance, time zone differences, and language barriers (HERBSLEB, 2007); long-lasting projects that involve large numbers of people (COOPER, EDGETT and KLEINSCHMIDT, 1998); or those involving a greater variety of functions and departments and more intensive interaction (SBRAGIA, 1982) – shows that the greater a project's complexity, the greater the need for information exchange during its execution. Broadly speaking, projects in our sample that featured all or most of the above characteristics obtained the highest scores in **degree of use** of communication practices.
- Modular project management was carried out most effectively at SMAR, where the intermediate (development) project phases occurred in a more independent operating environment, with lessened interaction between dispersed teams. This confirms the statements of Herbsleb and Mockus (2003), who maintained that the modular approach reduces the interdependence of tasks during project execution and consequently reduces the need for communication during the development stage. Concurrent engineering, in turn, was found to be most effective at EMBRACO, which also featured the highest use of communication practices among the companies in our sample. WEG employed a combination of both approaches, and obtained intermediate scores in communication practice use compared to the other two companies.
- Familiarity with tasks, and particularly with team members, was found to be a critical element for good project development in all companies in our sample. However, it bears noting that this aspect alone may not suffice to ensure a continuous communication flow across all project phases; that is, to prevent a decline of communications as the project progresses, continuous project follow-up mechanisms must be deployed. This finding was visible at SMAR and WEG; in both companies, some project phases featured decreased communication frequency. At EMBRACO, familiarity with project control and coordination mechanisms appears to have contributed to constant communication across all phases.
- In terms of leader autonomy, we found the leaders of the studied projects to have ample autonomy over project decisions, ample technical knowledge, a longstanding commitment to the company, and peer recognition, although they had no autonomy over teams or project budgets. However, we found that the leader who most approached the **heavyweight product development manager** concept proposed by Clark and Wheelwright (1993), the leader of EMBRACO project E1, was also the leader who assigned the most value to communication practices that foster inspiration and socialization among team members, and made the most use of these practices. Furthermore, the E1 project was reported to have had the most follow-up from top management among all studied projects. These factors reinforce the finding that **heavyweight** managers are those most integrative, as reported in the literature.
- The use of electronic communication support tools was considered a basic condition for carrying out global projects

in all companies in our sample. We found a trend towards use of more traditional tools, such as telephones, email, and audio-only conferencing. At SMAR, instant messaging was also used, and an unsuccessful attempt at videoconferencing was made. EMBRACO has a data sharing system in place which may be accessed by its subsidiaries. In short, we found that the companies that most encourage formal communication practices tend to use more traditional communication channels and electronic means of communication that are more formal. Conversely, companies that encourage informal communication foster the use of informal electronic communication practices, such as instant messaging. More sophisticated tools, such as DSM, which aids communication practices, were not used by the companies in our sample.

5. FINAL CONSIDERATIONS AND STUDY CONTRIBUTIONS

The core motivation of this study arose from the perception that one of the main challenges faced by global project management concerns the difficulty of long-distance communication. Although the literature considers communication to be one of the main aspects of project management, evidence suggests that, in practice, this aspect is neither fully appreciated nor mastered by project managers, particularly when it comes to global projects. Based on this finding, we defined the following research objectives: identifying which communications practices are used most often in and considered most important to global product development projects in Brazilian multinational corporations; and assess whether communication practices vary according to the type, life cycle stages, complexity, and integrative arrangements used in the product development process.

We were able to conclude that, overall, the practices considered most important are also those most widely used, with special emphasis on the following, all of which seek to provide a coordination function throughout the project life cycle:

- kick-off meeting;
- implementation of formal communications (paperwork and procedures);
- implementation of a communication channel to address doubts and solve everyday problems;
- regular project follow-up meetings.

Given certain methodological restrictions, all respondents notes a possible unbalance between the frequency with which they use communication practices in day-to-day business and the frequency with which they believe these practices should be used. We also found that communication practices, and the importance ascribed to them, vary according to several project characteristics, including project type, life cycle stages, complexity, and integrative project arrangements, including modular approach, familiarity with tasks, familiarity among team

members, and use of electronic communication support tools. It bears stressing that, Although we were able to identify these variations, communication practices were not found to occur in a standardized manner across several projects; quite the opposite, they are developed and deployed in an improvised, circumstantial manner and are not planned specifically at the start of each project. This runs counter to recommendations found in the literature, which states that communications planning is a key factor of project success (PMI, 2004).

Furthermore, our results allow us to conclude that the frequency of communication in projects actually decreases with distance, which hampers team control and coordination. Despite this creation of additional challenges, distance is not in and of itself a cause of communication problems, because it is buffered by the communication support tools that make up the foundations of dispersed projects. In order to overcome these additional challenges, however, the support provided by top management and project control and follow-up mechanisms is absolutely essential. The clarity with which goals and responsibilities are negotiated, prioritized, and made public to all those involved is also important.

As a **theoretical contribution**, this study related knowledge on three considerably broad areas: communication practices, global projects, and Brazilian multinational corporations. We compiled the communication practices reported in the literature, applied to global projects, and verified by their use in and importance to Brazilian multinational enterprises. Furthermore, we hope that the methods and research instruments created for this study will contribute to research in this area as complementary tools.

Regarding **practical contributions**, our results point out the practices deployed and desired by target companies. They also allow companies to reflect on other possibilities for the use of such practices according to project type, stage, or management characteristics. Generally speaking, practices followed the main recommendations found in the literature. Specifically, companies could do a better job of determining their communication procedures during projects – for instance, by clearly establishing a communications plan at the start of the project, regardless of whether the company prefers formal or informal communication mechanisms. This is key to improving a process as complex as global project development in a systematic manner, avoiding circumstantial, trial-and-error based practices. Systematization could be accomplished by analysis of which practices do or do not truly contribute according to project type, stage, and management characteristics.

As this was an exploratory study, we only considered a handful of cases in the study universe. Therefore, even if some of our conclusions could be extended to the universe of Brazilian multinationals in the industry sectors included in our samples, in no way should they be generalized any further. Refinement of the evidence obtained will require broader future studies designed with more stringent methodological rigor.

Our conclusions may, however, be used as a starting point in the search for further evidence; this is the foremost contribution of the present study. The second limitation that must be taken into account concerns the sector studied. All companies selected for our sample are in the same sector of industry (parts, components, and subsystems) and develop similar products (electrical and electronic equipment). Future studies on the theme could involve other industrial segments, particularly the software segment, a sector whose global project practices are widely known and on which a vast literature is available. Another implicit limitation is that all results simply reflected the viewpoint of the managers or directors interviewed in each company, which may have been made more favorable by their ample experience (all but one of our respondents had been with their respective companies for over 15 years at the time of interviews). Other specific limitations also concern the very theme of the study. The first such limitation concerns the global, dispersed nature of the study's unit of analysis. The fact that the study was conducted in a single branch of the case companies that make up the global project (the Brazilian unit of each company) may have somehow introduced a bias. For instance, some factors considered significant by the Brazilian team may not be found important by foreign teams, or vice versa. The second specific limitation is due to our criteria for choosing and classifying communication practices. Practices were synthesized in a subjective manner by the author of the present study, based on a review of the literature in the field rather than by following some list previously devised

by other authors, as there is little information in the literature that could guide such a choice (PAASIVAARA, 2005). It is therefore possible that our choice of practices limited the results of the study, although we never intended our selection to constitute a complete list.

As suggested future research directions, we recommend that our study be carried over to other multinational corporations, contrasting the opinions of headquarters and subsidiaries, as we believe that comparison between these two viewpoints could greatly enrich discussion on communication practices. Another possible extension of our research would be geared at understanding the manner in which project management characteristics influence the communication process, and at identifying which management characteristics could have a positive effect on long-distance communication. Obviously, there are other aspects that may be related to variations in the use of communication practices, such as the organizational structure – centralized, decentralized, or specialized – of which global projects are a part (CHIESA, 2000; GASSMANN and VON ZEDTWITZ, 1999). Due to limitations in scope, these aspects were not considered in the present study.

Future studies could also try to identify which communication practices could positively affect project deadlines. This recommendation is warranted because some authors correlate the difficulties of long-distance communication with increased project development times (HERBSLEB and MOCKUS, 2003). ♦

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ABSTRACT

Communication practices in global product development projects of Brazilian multinational firms

This study sought to identify the most frequent and important communication practices used in the global product development projects of Brazilian multinationals and to analyze whether these communication practices vary according to certain project characteristics. The study has an exploratory nature and the research method chosen was the multiple case study. Our results indicate that the frequency of communication in global projects decreases as distance increases, making the control and coordination of the teams more difficult. However, distance, per se, despite adding to the challenges, does not necessarily cause communication problems, as one can bypass it with electronic communication tools. The study also concludes that communication practices and the importance ascribed to them vary depending on certain project characteristics, such as project type, product life cycle, project complexity and the integrative arrangements used in product development. Although these variations were identified, we found that communication practices do not arise in a standardized manner across all projects; conversely, they are improvised and circumstantial and do not rely on any specific planning at the beginning of the project.

Keywords: global product development projects, Brazilian multinationals, communication practices.

RESUMEN

Las prácticas de comunicación en proyectos globales de desarrollo de productos en empresas multinacionales brasileñas

El objetivo de esta investigación fue identificar las prácticas de comunicación aplicadas a los proyectos globales de desarrollo de productos de empresas multinacionales brasileñas y analizar si esas prácticas varían de acuerdo con algunas características de los proyectos. Es un estudio de naturaleza exploratoria, cuyo método de investigación fue el estudio de casos múltiples. Los resultados permitieron verificar que la frecuencia de la comunicación en los proyectos globales disminuye con la distancia, lo que dificulta el control y la coordinación de los equipos. Sin embargo la distancia por sí sola, aunque imponga retos adicionales, no causa necesariamente problemas de comunicación, pues es posible superarla con la ayuda de las herramientas electrónicas de comunicación. El estudio permitió concluir, además, que el uso de las prácticas de comunicación, así como la importancia a ellas atribuida varían en función de algunas características de los proyectos, tales como el tipo de proyecto, las etapas del ciclo de vida, el nivel de complejidad y los arreglos integradores utilizados en el desarrollo de los productos. Aunque haya sido posible identificar tales variaciones, se observó que las prácticas no ocurren de forma ordenada en los proyectos; al contrario, se desarrollan de forma improvisada y circunstancial y no cuentan con una planificación específica al inicio del proyecto.

Palabras clave: proyectos globales de desarrollo de productos, multinacionales brasileñas, prácticas de comunicación.