Um modelo de protocolo para o método de estudo de caso

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Resumo: Estudos que adotam o método do estudo de caso são frequentemente criticados pela falta de rigor. Isto é preocupante, considerando a popularidade deste método de pesquisa. Alcançar o rigor exige algumas ações do pesquisador; uma deles é a adoção de um protocolo de pesquisa robusto. No entanto, informações sobre o protocolo do estudo de caso são fragmentadas na literatura. Com o objetivo de auxiliar outros pesquisadores, este artigo apresenta um protocolo de estudo de caso para pesquisas qualitativas na área de gestão de operações. A proposta é resultado de um protocolo testado em campo e de uma extensa revisão da literatura cobrindo diferentes áreas do conhecimento. O protocolo contempla um conjunto de recomendações e deve ser usado como um guia de referência sobre "como proceder" na coleta de dados e etapas relacionadas. Se planejado e utilizado com cuidado, o protocolo orientará o pesquisador, favorecendo o rigor da pesquisa.
Palavras-chave: Protocolo de estudo de caso, Pesquisa qualitativa, Área de gestão de operações

A protocol model for the case study method

Abstract: Studies that adopt the case study method are often criticized for lack of rigor. That is worrisome considering the popularity of this research method. Achieving rigor requires some actions from the researcher; one of them is the adoption of a robust research protocol. However, information about the case study protocol is fragmented in literature. Aiming to assist other researchers, this article presents a case study protocol for qualitative research in operations management field. The proposal is the result of a protocol tested in the field and an extensive literature review covering different areas of knowledge. The protocol comprises a set of recommendations and should be used as a reference guide on "how to proceed" in data collection and related steps. If planned and used with care, the protocol will guide the researcher, favoring the research rigor.
Key-words: Case study protocol, Qualitative research, Operations management field

1. Introduction

Operations management (OM) is a very important cross-functional field; it deals with the operations and resources that generate the goods and services in organizations and supply chains. In this field, the case study method is very common (BARRATT *et al.*, 2011).

At the beginning of his doctoral program in OM, the author of this article realized that the focus of the research chosen clearly indicated the case study as the most appropriate research strategy. Adopting the perspective of supply chain management (SCM) approach, he analyzed the problems that one of the largest aircraft manufacturers in the world faces in the procurement process. Although the author already mastered the basic concepts of scientific methodology and case study often presented in undergraduate courses, his need required more rigor. Because of this, he sought a robust protocol in the literature, but some difficulties arose.

First, an analysis of the available literature (see Section 4) generated in the author the perception that the information available on the case study protocol is fragmented. Thus, it

may be risky for a researcher to select and adopt two or three references, because they probably will not eliminate many doubts of those who are about to enter the field to conduct a case study (especially for the first time). Thus, the author initially sought to elaborate a protocol using the experience (available in the literature) of several researchers in OM field, with the objective of planning his research and minimalizing risks and reworks. With the research progress, the author also decided to take advantage of the contribution of other areas that face similar difficulties and that have adopted the case study method for as long as or more than this field.

A second difficulty faced by the author was the criticisms and shortcomings associated with the case study method (several researchers address this issue: SEURING, 2008; PIEKKARI *et al.*, 2010; WOODSIDE, 2010; BARRATT *et al.*, 2011). It is not uncommon to find in texts or hear in the corridors of universities criticisms that limit the scope of the case study and question its methodological rigor. Fortunately, there are already studies in the literature (McCUTCHEON & MEREDITH, 1993; JOHNSTON *et al.*, 1999; STUART *et al.*, 2002; TSANG, 2014) that present a careful and constructive analysis of which criticisms are meaningless and which have foundation and, in the latter case, in which contexts they are valid (and how to avoid them). Notwithstanding, the criticisms initially discouraged the author. However, with the research progress and some guidelines, he realized that criticisms should not be seen as a reason to change the method, but as a warning reinforcing the importance of a robust protocol.

This article represents the result of a real experience that an OM researcher had with the case study method. It presents a protocol model for qualitative research using the case study method. The next section deals with case study research and protocol. Section 3 details the objective and method. Next, the case study protocol model is proposed. Final considerations are presented in Section 5, followed by references.

2. Case study method and the protocol

There are several case study definitions in the literature. “Case study is an in-depth exploration from multiple perspectives of the complexity and uniqueness of a particular project, policy, institution, programme or system in a ‘real life’ context” (SIMONS, 2009, p. 21); “(...) a research strategy that examines (…) a phenomenon in its naturalistic context, with the purpose of ‘confronting’ theory with the empirical world” (PIEKKARI *et al.*, 2009, p. 569). Yin (2009) recommends this method for the researcher who wants to understand a real-life phenomenon in depth, but such understanding should encompass important contextual conditions. “The task of the analyst [researcher] is to progressively construct the context and boundaries of the phenomena under investigation (...). The research object, its boundaries and context are often emergent outcomes of the research process” (DUBOIS & ARAUJO, 2007, p.171); “no attempt is made to isolate the phenomenon from its context, but instead, the phenomenon is of interest precisely because of its relation to its context” (JOHNSTON *et al.*, 1999, p. 203).

A case study usually has the following features: it is flexible because the researcher can include a range of methods in the same study (SIMONS, 2009; THOMAS, 2011); it employs a variety of data sources (VOSS *et al.*, 2002; PIEKKARI *et al.*, 2009); the researcher has little or no capability of manipulating the events or phenomena under study (McCUTCHEON & MEREDITH, 1993); it requires considerable time, effort and expense to conduct (McCUTCHEON & MEREDITH, 1993; MEREDITH, 1998; JOHNSTON *et al.*, 1999; STUART *et al.*,

2002); it needs skilled interviewers (VOSS *et al.*, 2002); it is useful for both generating and testing theory (FLYVBJERG, 2006).

In the context of case study method, there is a protagonist element: the case study protocol. Various researchers (some examples: TELLIS, 1997a; STUART *et al.*, 2002; YIN, 2009; DUBOIS & GIBBERT, 2010; GIBBERT & RUIGROK, 2010) associate the protocol with the rigor (the quality) of the case study method. The protocol is a document usually prepared at the beginning of the research that guides the researcher's focus and conduct, thus helping to proceed with rigor and efficiency.

If in the broad literature there is an extensive discussion on qualitative research and the case study method, including excellent references that are recurrently cited (STAKE, 1995; TELLIS, 1997a, 1997b; MERRIAM, 1998; SIMONS, 2009; YIN, 2009; CORBIN & STRAUSS, 2015), the same cannot be said about the case study protocol. Actually, specific references about this theme are scarce. Particularly in OM field, an article dealing specifically with the case study protocol is not found in the most influential journals. What is found are some interesting studies (for example: STUART *et al.*, 2002; VOSS *et al.*, 2002) that provide some guidance on the protocol because they deal with the case study method. But because of their broader scope, the protocol is not discussed in detail as it is not the focus of these studies. There are also several texts (they are cited in Section 4) that provide more specific contributions on the protocol. But the fragmentation of information about the protocol is not exclusive to the OM field. In general, the references available in other areas are also divided among those which offer more specific contributions (see Section 4) and those which have good guidelines on the protocol (EISENHARDT, 1989; TELLIS, 1997b; YIN, 2009), but that do not deprive themselves of complementation when the goal is to plan a complex research as a case study.

3. Objective and method

It's expected that "(...) the OM field will continue to see increasing numbers of qualitative case studies (...)" (BARRATT *et al.*, 2011, p. 338). In this context, the article presents a protocol model for qualitative case studies. The proposed model facilitated the development of the author's research and contributed to the results, eliminating doubts and uncertainties and reducing reworks. The author then wanted to share his experience, aiming to contribute to the lack of articles that directly discuss the case study protocol for OM researches.

Unlike other studies that approach the case study method or the protocol from a purely theoretical-conceptual perspective, this article is one result of an applied research (see Section 1) developed in OM field. In Section 4, this research was used to illustrate the content of the proposed protocol (examples or illustrations are typically provided at the end of each item). Thus, besides testing and applying the contributions of other researchers, the author sought to organize and extend them into a complete protocol.

The first version of the protocol was created through an extensive review of the literature; several texts that present orientations about the protocol or the case study steps were gathered. A content analysis was then carried out. So the information was coded (NEUMAN, 2014) according to the activities that are typically performed in the steps of a case study.

This first version was evaluated by two OM researchers, who at the time were research supervisors. Subsequently, it was applied in a pilot interview. After making the necessary corrections, the author used it for data collection and as a guide for consultation and guidance. It was used in eighteen interviews (individual, face-to-face) and evaluated by four

independent researchers (without direct relation to the research) from OM field, in two different moments: two researchers evaluated the protocol after the first interviews and at the end of the author's doctoral program, when it was also evaluated by two other researchers. The protocol was kept by the author in a database, in digital format.

4. The proposed case study protocol

The content of the proposed protocol was divided into two parts. Part I is more detailed because it meets the most common goal of a protocol: to support data collection. Complementing it, part II presents a guide for conducting interviews. This protocol provides a set of recommendations to assist other researchers in the development of their research. Additional or complementary information can be obtained in the texts quoted throughout the two parts of the protocol.

4.1 Part I: Recommendations on data collection

Data collection should be preceded by a systematic plan that details what information will be sought and how (JOHNSTON *et al.*, 1999). This part of the protocol presents recommendations to assist the researcher in the elaboration and execution of this plan.

Questions of the questionnaire

Besides the research focus itself (in terms of problem and objectives), there are other typical references to elaborate the questions: previous research, existing theories, literature reviews and pilot studies or interviews (WESTON *et al.*, 2001; GIVEN, 2008; ANTIN *et al.*, 2015). Adjustments to questions (such as inclusions or changes) are allowed, but only make sense if they are not due to haste or lack of rigor; reworks can be costly in case studies.

The author identified problems in the literature related to procurement process, as well as strategies to address them. This information suggested the first questions of the protocol. New questions emerged from a detailed study on the SCM approach. The supervisors of the author's research evaluated the questions elaborated and later they were refined in a pilot interview. Aiming to facilitate the data analysis (especially the comparison of collected data), the author sought to establish a direct relationship between the problems or strategies and the questions (in general, each question dealt with a problem or a strategy) and each interviewee was treated as a case.

In the literature there are general recommendations regarding the elaboration of the questions: the language and the terms used should be familiar to the respondent (FLYNN *et al.*, 1990; GIOIA *et al.*, 2012); the question should not contain ambiguous statements or words which are not well defined (LUMMUS *et al.*, 2005; HURST *et al.*, 2015) or compound events (the respondent can agree with one part of the question but disagree with another, "making the overall response meaningless") (LUMMUS *et al.*, 2005, p. 2692); combining two or more important issues in a single question can make respondent confused (HURST *et al.*, 2015); the question cannot induce a response by the respondent in any direction (biased question) (LUMMUS *et al.*, 2005; ROULSTON, 2010; GIOIA *et al.*, 2012); redundant questions should be eliminated (HURST *et al.*, 2015); the order of the questions should be planned (the "funnel model" is common: the questions are asked from general to specific topics) (VOSS *et al.*, 2002; ROULSTON, 2010).

The author received additional recommendations from the researchers who evaluated his protocol. Does the question make clear the context in which it should be answered? Is the

scope of the question according to the desired? (For example: does the question deal with a momentary/specific or general situation?) Would the question be better if it were more personal/impersonal, more formal/informal, more direct/indirect? Would any answer to an earlier question invalidate (or influence the answer to) a later question? Would it be better to divide a question (into two or more) or group some of the questions? Compare the research focus (problem and objectives) with the questions: is there any important question or concept that was not included in the questionnaire? Is there any unnecessary question or concept in the questionnaire? Evaluate the appropriateness of the questions to the intended audience: are the respondents authorized or able to provide the requested data?

It is important the questionnaire creates and maintains the interest of respondents. Therefore, the researcher must assess whether it is tedious or too long.

Actions preceding the interview

To avoid misunderstandings or surprises, the researcher must confirm the interview and the time a few days before the scheduled date. If the interview is face-to-face, it is also important to confirm the location, get permission to access the organization and check in advance if there is any access restriction (an example: when visiting a factory, it is common to require specific clothing or shoes that may not be provided by the company). It is essential to reserve adequate time for each interview. The best reference is the tests carried out (pilot case or pilot interviews). From the author's experience, when a face-to-face interview exceeds two hours, the interviewees begin to show signs of tiredness, inattention or impatience. Fatigue will inevitably affect the quality of a respondent's responses (see HURST *et al.*, 2015).

There should be special attention to the place of the interview, because it influences the quality of the information collected (HURST *et al.*, 2015). Noise is a typical problem: in addition to disrupting communication and concentration, it "makes the clean transcription of a human voice captured on the digital recorder more difficult" (SINHA & BACK, 2014, p. 473). Therefore, the researcher must choose (or request) a comfortable, quiet room with pleasant temperature and where there is minimal possibility of interruptions generated by the external environment.

What to bring to the interview

The author recommends: a recorder (if allowed by the interviewee and company) and a clock (a smartphone can replace both), a pencil, a pen and an eraser, diagrams, figures and texts that complement or illustrate the questions or discussions that may occur during the interview, any document that is necessary for entry into the organization (if the interview is face-to-face) and the part II of this protocol.

Starting the interview

At the beginning of the interview (and in a formal way) the researcher must confirm the informant's consent to participate in the research. When the informant does not participate of his or her own free will, the interview tends to be unproductive, because "weak consent usually leads to poor data" (MILES *et al.*, 2014, p. 60). Consent can be obtained through a verbal statement or the interviewee's signature.

Another subject to address at the beginning of the interview refers to the need to keep the organization name and informant identity confidential (in OM field, the first information is

typically more relevant and therefore whenever possible should be disclosed). There are situations in which company policy imposes restrictions; in others, the researcher must present the options and let the informants choose. One advantage of keeping the interviewees' identity confidential is that as they will not be publicly associated with the research, they may feel in a more comfortable and secure position that will give them more freedom to talk. Foreseeing a potential difficulty in deepening his understanding about the case, the author decided to adopt this strategy after consulting some peers and informants.

Once the interview is started, the researcher must be rigorous in controlling the time, avoiding to exceed the agreed upon duration.

The researcher's role during the interview

In the interview, the researcher's role cannot be interpreted in a mechanical (instinctive, automatic) or improvised way, but needs to be carefully planned. It is fundamental to gain the confidence of the interviewee (STUART *et al.*, 2002), because it favors the flow and quality of information. The challenge is that there is often not enough time for this – so it is important to create opportunities. The author always sought to start a face-to-face interview with a coffee or a more informal conversation. In non-face-to-face interviews, "exchanging emails, messages or reports can facilitate (...)" (DEAKIN & WAKEFIELD, 2014, p. 613). It is also essential to find "(...) a good balance between talking and listening" (MASON, 2002, p. 75). This means, among other things, that the interviewee should not be interrupted (unless it is truly necessary). Another critical point: when going into the field, the researcher can take strong biases; illustrating: the study addresses a problem with some possible solutions and the researcher is a defender of one of them. "Personal biases can shape what you see, hear and record" (VOSS *et al.*, 2002, p. 210). Therefore, adopting a neutral (impartial) position is an obligation: the researcher cannot express an opinion on the research topic (ROULSTON, 2010), issue judgment on the interviewee's speech or compel responses in any direction.

Leonard-Barton (1990) compares the researcher to an investigative reporter. Thus, the researcher must "(...) interpret the answers" (YIN, 2009, p. 69), "(...) make connections" (BRAYDA & BOYCE, 2014, p. 320) and look "(...) for convergence of views and information about events and processes" (VOSS *et al.*, 2002, p. 209). It is also important to be aware of the possible untruths said by the interviewees (ROULSTON, 2010), incomplete views (VOSS *et al.*, 2002), inaccuracies due to poor recall, reflexivity (when the interviewee gives what the interviewer wants to hear) and conspiratorial corroboration (when the interviewees repeat the same speech) (YIN, 2009).

Record of data

There are two main ways to record data during an interview (see TESSIER, 2012). The first is to use field notes. Due to the difference in speed between speech and writing, the author sought to prioritize the annotation of the most important points of the informant's response, requesting the repetition of some points whenever necessary. Beyond the answers, it is important to record ideas and insights that arise during the interview. The second way is to use a recorder to capture interview data (audio and video or audio only). The problem is that a recording device on the table can be intrusive, intimidating some informants. Therefore, the researcher must ask the interviewee for authorization to use a recording device and then be strictly faithful to what was negotiated.

In his research, the author respected the preference of the interviewees and used field notes. At the end of interviews, when asked by the author they stated that inevitably the presence of a recording device would have affected (negatively) the amplitude and depth of their responses (the questions addressed practices and processes of the company studied).

In the field, the researcher should not only record what is heard, but also what is observed, because the interviewee conveys valuable nonverbal data: nervousness, doubt, fatigue *etc*. This type of data will be of great value to the researcher in the data analysis step.

The author used a coding system to facilitate the collection of nonverbal data in the field. Illustrating: in field notes, the author included (discretely) the symbol [?] next to the response whenever the informant showed doubt; the symbol [!] was included when a response from the current informant seemed to corroborate strongly with that of a previously interviewed informant (in the opposite situation, when there was a clear divergence, another symbol was used).

Complementing and storing collected data

As soon as possible after completing each interview (taking advantage of the fact that the interview is still fresh in the mind), the researcher should complement the field notes with new ideas, impressions and insights that emerged after the meeting with the informant (see: TESSIER, 2012; ANTIN *et al.*, 2015). Problems or unforeseen occurrences in the field should also be recorded. This will enrich the data collected, contributing to the analysis step. Antin *et al.* (2015, p. 215) used to register after an interview "summaries of salient ideas related to the research topics of interest, thoughts about what the respondent emphasized or omitted, contradictory discussions about the main research topics of interest and reflections on how themes from this respondent related to others (...)".

Soon afterwards the researcher must store all data recorded during and after each interview in the research database. It is recommended that the field notes and recordings be transcribed into a digital text file, ensuring data integrity and preservation, but this will require some effort. When transcribing field notes and recordings, the researcher should include details or a description of nonverbal data. To facilitate this work, the researcher can create or use an existing coding system (see for example IRVINE *et al.*, 2013).

Member checking

The next activity is the "member checking" process in which transcriptions and interpretations are sent back to interviewees so they can judge the accuracy and credibility, solve misinformation *etc.* (CRESWELL, 2007; ROULSTON, 2010).

The author explained the member checking to each informant at the end of the interview. About one week after the interview, an e-mail was sent with the transcript of the data collected, interpretations of the author and doubts about the answers (information about nonverbal data was not sent). The informants then returned their responses confirming the information and suggesting changes or exclusions (in interviews, informants may provide information that they later decide not to disclose). To avoid delays in the progress of the research (JAMES & BUSHER, 2006, report this problem), the author made it clear in the e-mail that the agreed upon term should be fulfilled (the informants had about two weeks to return their responses), otherwise it would be understood that the informant fully agreed with the information sent by the author.

4.2 Part II: Interview guide

In this part an interview guide model is presented to be used in each interview (or case). Its purpose is to help the researcher to record data and conduct the interview efficiently. It should be created in some digital format; during an interview, the researcher can work directly on the digital file or use a printed copy. The guide has been divided into topics that follow the chronological order of the interview phases. Description of the topics includes additional recommendations on data collection, complementing those presented in part I (they were included here because of their close relation to the guide).

Information about the interviewee, the company and the interview (for researcher control)

On the first page, the researcher must fill out information about the informant, the organization studied and the interview, to register who was interviewed and the type of interview conducted. Ideally, this information should be obtained before the interview, because this will allow more time for the application of the questionnaire; however, some may only be collected at the beginning of the interview.

Regarding the informant, the following information is typically relevant: name, phone number and e-mail; academic background; professional information: date of entry into the organization, department, position and starting dates in the department and position. Because the purpose of a study can vary greatly, it is important to define precisely what information about the organization is essential; some examples: name and location (headquarters and subsidiaries); general information: number of employees, revenue and profit; product lines; market share; main clients, competitors and suppliers. Information about the interview: date and start time; location (or locations, if the researcher and interviewee are not face-to-face); the type of interview (face-to-face or mediated by some technology); the form of data recording (field notes, audio/video recording, e-mail *etc.*); if the organization name and informant identity should be kept confidential ("yes" or "no"). Any other relevant information should be included on the page of this topic.

The author spent about ten to fifteen minutes to: (i) collect the previous information that could not be obtained in advance, (ii) confirm the informant's consent to participate in the research, (iii) negotiate the form of data recording and (iv) request authorization to disclose the organization name and informant identity.

Information about the research (to be explained to the interviewee)

All important information about the research should be gathered on the second page. For example: the researcher's contact details (name, phone number, e-mail and professional address); information about the sponsor and organization responsible for the research; level or type of research (undergraduate, doctoral, government-funded sectoral research *etc.*); research focus (problem and objectives); expected contributions (to the academy, sector and informant's organization); current research step (for example: field research).

The author preferred to print this page and deliver it to each informant. In addition, the author spent about five to ten minutes highlighting key information, including expected contributions. This strategy helped to gain the informant's confidence because it favored the feeling of truthfulness of the research and importance of the interview.

Instructions about the interview (to the informant)

On the third page, it is valid to include brief instructions that should be read to the informant before the application of the questionnaire. One instruction used by the author was: "In this interview you are free to use your professional knowledge and experience and personal opinion to answer the questions. You can cite examples that facilitate or illustrate your response. However, sensitive information should be preserved".

Definition of terms used in the questionnaire

There are situations in which the researcher identifies terms in the questionnaire that may generate doubts in the interviewees, but are difficult to avoid because they are intrinsically associated with the research. In the field, undesirable situations may occur: during the application of the questionnaire, the informant may request that the researcher explain the term, generating an undesirable interruption in the interview (and in the line of reasoning of both); it is also possible for the informant to answer the question by interpreting the term with a meaning different from that considered by the researcher.

To avoid these risks, the author recommends that these terms and their meanings be included on the fourth page and read to the interviewee before starting the questions. In his study the author selected four terms, one of them being the following: "Supply chain: refers to the set of companies responsible for some stage of transformation of the final product – a car, for example. The term encompasses, in this example: the car manufacturer, the direct suppliers of the car manufacturer (first tier suppliers), the suppliers of the car manufacturer's suppliers (second tier suppliers) and so on".

The questionnaire

Following are the pages with the questionnaire. The researcher should never underestimate the importance of field notes, even when a recording device is used.

Completion of the interview

After the interviewee answers the last question, there are some actions that will take about fifteen to twenty minutes. The following information was included on the penultimate page of the guide to remind the author to complete them:

- "Inform that the interviewee can at any time contact the researcher [author] by e-mail or telephone if he/she wishes to make additional comments or additions to his/her answers".
- "Ask permission to send a new question (which may arise later during the research) to the interviewee, by e-mail or telephone".
- "Ask the interviewee for constructive criticism, suggestions or comments about how the interview was conducted, the questions presented and the discussions that emerged throughout the interview".
- "Considering that the content of the study has already been presented: Would the interviewee like to recommend a professional (from this or another organization) to participate in the research? In this case, how could this professional be contacted?".
- "Explain the member checking process to the interviewee and agree upon deadlines".
- "Record the interview end time".
- "Provide an estimate of the research end date. Does the interviewee want to receive a copy of the final report?".

– "Finally, thank the interviewee".

Control of expenses

Information about the expenses associated with the interview should be included on the last page of the guide: type of expense (fuel, toll, food, hotel, ticket *etc.*), amount spent, date and location. All supporting documents must be attached.

5. Final considerations

The proposed protocol includes a set of recommendations and should be used as a reference guide on "how to proceed" in data collection and related steps. It can be applied in any type of case study, especially in those that adopt the interview as the main source of information. Evidently, the decision to propose a more general protocol resulted in limitations. As in practice the studies can have very different characteristics and contexts, the researchers must make the appropriate adaptations (modifications and inclusions) in the protocol. These adaptations are likely to be deeper in some types of study (longitudinal, for example) because of their particularities. Regardless of the protocol adopted, two actions are fundamental: the review of the protocol by the pairs and the execution of pilot interviews aiming to test it in the field.

It is important to highlight that no method, even the most flexible, survives the lack of planning, scientific immaturity and insufficient commitment to rigor. Based on this fact, in the search for the chain of evidence (that is, the progression of the research from the initial question to its results and conclusions) the case study protocol plays an essential role because it directly affects the efficiency (proper use of resources) and the effectiveness (achievement of expected objectives) of the research. If planned and used with care, the protocol will guide the researcher, favoring the rigor and quality of the results.

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