Understanding Planning Practices: Insights from a Situated Study on an Italian Airport

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Submitted to the
Faculty of Communication Sciences
Università della Svizzera italiana

for the degree of
Ph.D. in Communication Sciences

August 2015

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Officially submitted to the PhD committee of the Faculty of Communication Sciences, Università della Svizzera italiana, in August 2015

Abstract

This research projects examines planning as an instance of instructed action—that is, by focusing on how plans are designed and changed to anticipate actions, by competently using the instructions that regulate work. It does so by drawing on ethnomethodology and membership categorization analysis to understand the empirical materials collected over the course of ethnomethodologically informed ethnography in an airport center for the handling activities coordination. By focusing on plans, this research aims to foster understanding of cooperative dynamics in workplace settings. By approaching the study of plans as instructed actions, this research makes a new and original contribution to the understanding of plan use and planning as coordinative tool, and so unveils previously unnoticed aspects of plan use. In fact, it explains plans as artifacts that make it possible to maintain a consistent relationship between planning instructions and lived events, and to therefore link local and more transcendental aspects of work, such as the need to face patterns of organizational failure and maintain temporal coordination. This, in turn, has made it possible to challenge preconceptions in the study of plans. Indeed, by comparing the operators' practices for the competent setup and change of plans with literature on temporal coordination, it was possible to contradict current understanding of the role of plans in temporal coordination, which acknowledges that plans are difficult to use as temporal coordination devices. Moreover by comparing data analysis with the literature on organizations' capability to face the unexpected it was possible to challenge the received understanding of plans put forward by the mainstream theories on this topic, which recognize that plans and planning are not suitable for managing the unexpected or that they might even threaten the organization's capability to face the unexpected. In addition, inspired by understanding anticipation as an embodied accomplishment forwarded by the concept of instructed actions, it was possible to engage with the understanding of the capability of plans to anticipate events as a distributed, artifact-mediated and dynamic accomplishment and, as a consequence, to challenge the received understanding of plans as artifacts whose capacity to anticipate future ways of performing activities is an immutable feature. Last but not least coupling the

understanding of planning as an instance of instructed actions with the analysis of planners' interactions in light of the conceptual apparatus provided by membership categorization analysis has made it possible to go into the study of planners' interactions to explain re-planning as the effort to meet the outcomes of instructions with the local contingencies of work and to show how decisions about changes in the information content of the plans are made. In studying plans as instructed actions this study seeks to guide research on planning towards a more extensive understanding of plans as the outcome of the 'tendentious use of instructions'.

Acknowledgements

This dissertation could not have been written without the support of many people, to whom I want to express my gratitude.

I thank my supervisor Antonella Carassa for the excellent guidance she offered me throughout the execution of the research project. Her comments have always been precious sources of encouragement but also of critical analysis of my work. I also want to thank her for the training she gave me, but above all for having shown me that passion and compassion are essential to making a good supervisor.

I am also grateful to all the people who offered me guidance at different stages of my research. I thank Fabio Dovigo who encouraged me to go for my dream to pursue PhD training, and for having given me great support in the planning phase of my research project.

I am also indebted to Dave Randall for stimulating discussions and feedback on early thoughts. I will never forget his generosity and patience while helping me disentangle my doubts when I was attempting to formulate the central thought of the research project. In addition, I thank Luigina Ciolfi who gave me the oppotunity to discuss my research project at the Interaction Design Centre at the University of Limerick, and who gave me excellent feedback during early data analysis.

I thank all the people who commented on my work during the Doctoral Colloquium Sessions of the Twelfth European Computer Supported Cooperative Work Conference held in Aarhus in 2011 and the Fifteenth Computer Supported Cooperative Work Conference held in Seattle in 2012. In addition, I thank those who gave me valuable feedback during the Thirteenth European Computer Supported Cooperative Work Conference held in Cyprus in 2013, during the Eleventh International Conference on the Design of Cooperative Systems held in Nice in 2014, and during the Eighteenth Conference on Computer Supported Cooperative Work and Social Computing held in Vancouver in 2015, during which I presented the papers originated by the research

project. In particular I want to thank Kjeld Schmidt, Thomas Herrmann, Andy Crabtree, Leysia Pallen and Gabriela Avram for the encouraging feedback they gave me. I would also like to thank Marco Colombetti and Davide Nicolini for their useful remarks on preliminary results and the anonymous reviewers who helped me improve the papers originated by the research project.

I am also indebted to with Viviana Meschitti, a colleague and friend with whom I shared my fears and hopes, and with Loretta Locatelli, Alessandra Preziosa and Stella for listening.

I thank Roberto Rampinelli and Laura Monteleone, who so generously gave me access to the Italian airport where I collected my data and to all those on the Ramp Control Tower who allowed me insight into their work and who wholeheartedly supported this research.

I am grateful to my parents who made this research possible in many practical ways and I dedicate this dissertation to my father.

Contents

1. Introduction

1.1 Aims of the study

This project aims to contribute to understanding plans and planning to explain their role in the coordination of work. All the documents and organizational practices that define objectives that need to be pursued, and that detail the steps necessary for achieving those goals, can be defined as instantiations of plans and planning work. As such, plans and planning are not only omnipresent organizational instruments, but also observable phenomena that can be studied by looking at how manuals, checklists, flowcharts, instructions, organizational procedures, policy statements and so on are used, and by looking at the practices that, occurring in meetings or in other organizational events, show how decisions about how to organize courses of events are developed. Cooperative work is a widespread phenomenon as well, in that it is as the basis of the actual organization of work. In fact, as Schmidt (Schmidt, 1991; p. 4) notes, organizations are able to dynamically adapt to the "turbulent character of modern business environments" and to "the compelling request to improve their innovative capability, operational flexibility and product quality" thanks to the systematic division of labor but above all thanks to "the coordination of distributed activities across functions and professional boundaries within the organization or within a network of organizations in a comprehensive and integrated way". As such, coordination can be studied by looking at the kind of interdependencies that exist between dependent subjects, and at how they are regulated in specific and historically orientated settings. This means that coordination can be understood by looking at the specificity of work practices that, in turn, can be identified by studying, inter alia, how planning is carried out and how plans are used to support the coordination of work.

This project views the understanding of plans and planning from the ethnomethodological perspective—that is, drawing on detailed empirical analysis of how

organizational members deal with plans and planning, to help overcome some 'fixations' in the study of plans, namely the study of plans as instruction to be followed, and the study of plans as 'freestanding tools', which seem to be unintended legacies of Suchman's (1987; p. 179) understanding of plans and situated actions. In her seminal work Suchman puts forward the need to conceptualize plans as resources for executing action, more than causes of actions as cognitivists would have, in that the implementation of action does not depend on the completion of an anticipated series of steps, but on "moment-by-moment interactions between actors, and between actors and the environment of action". In her opinion it is wrong stating that actions can be fully pre-planned because "the organization of action is emergent" (Suchman, 1987; p. 179) and the cognitivist's conceptualizing actions as determined by plans that, as mentalistic constructions, are prerequisite of action, is wrong. Suchman's conceptualization of actions as unavoidably situated has strongly impacted the scientific community permitting significant advancement in socio-technical research. For example, she has highlighted that attempts at designing instructional computer systems in terms of plans with which to predict the users' actions and to anticipate the users' inquiries are bound to fail because such systems cannot access the highly contingent processes in which they are used. In doing so, Suchman compares plans with instructions and builds on Garfinkel's work (Lynch, Livingston and Garfinkel, 1983) noting that following instruction requires interpretative work. Garfinkel, in fact, as Lynch (2002b) explains, tackles the sociological problem of how instructions connect with the enactment of actual activities by explaining that 'instructions' and 'following instructions' are in a reflexive relationship, as follows:

> "This order can be schematically represented by using the term instructions to stand for the various texts, rules, models, and so forth that make up the formal part of the pair:
>
> [instructions] →{Lived course of action}
>
> The arrow denotes the situated work of using the instructions, making out what they say, finding fault with them, re-reading them in light of what is happening just now, and other contingent uses and readings. Despite the directionality of the arrow, the route traveled from instructions to lived course of action is not a one-

> way street, nor does the 'lived work' follow a single pattern. Instead, the formal account of the *Lebenswelt* pair itself acts as a gloss that requires the (re)discovery of the local work of doing what the pair formulates. The point of juxtaposing the two pair parts is … to encourage investigations of just how the lived work of any given pair is achieved" (Lynch, 2002b; p. 129).

But Suchman's work has also been deemed controversial because it has, more or less deliberately, introduced conceptual confusion regarding the features and use of ordinary plans. Schmidt (2011b), for example, one of the most influential scholars in the Computer Supported Cooperative Work (CSCW) community—that is, the area of study of cooperative work for the design of computational artifacts—, claims that Suchman has created a sort of opposition between plans and situated actions, presenting plans as poor resources that limit human actions and claiming that plans are abandoned during the execution of action. But above all, Schmidt notices that in her effort to criticize cognitivism, Suchman takes for granted that plans cannot determine actions, thus engendering a dogma that is the opposite of that engendered by cognitivism: the dogma that plans cannot determine courses of action. In Schmidt's opinion (2011b; p. 383), in fact, Suchman's casting her attempt to invert cognitive psychology's conceptualization of plans as a contraposition between cognitivism and situated actions has led researchers to take for granted that plans play a residual role in the organization of courses of action, thus preventing them from investigating the specificity of work practices connected with the use or set-up of plans.

> "While Suchman's book showed a way out of cognitivism, towards studies of actual work practices, it also—unwittingly but effectively—was instrumental in establishing another dogma, the dogma that plans play no role *in* action, i.e., in determining the course of action. The dogma was not intended but was the consequence of Suchman's mirroring cognitivism's metaphysical form of reasoning". (Schmidt, 2011b; p. 384)

In other words, Schmidt notes that the idea that plans cannot determine actions is an assumption inadvertently established in the course of Suchman's arguing against cognitivism which, in turn, depends on one main fault in her argumentation: to have taken "the cognitivist's concept of a plan as meaningful, albeit objectionable" (Schmidt, 2011; p. 367), thus putting herself in a position to challenge this assumption. This is why

he engaged in the empirical demonstration that plans can determine our actions. For example he notices that the capacity of plans to determine actions depends:

> "On the extent to which it is possible to identify and model interdependencies in advance … Protocols play very different roles in cooperative work. They may, on one hand, as suggested by Suchman and others, play the weak role of the 'map' of the traveler that offers a codified representation of salient features of past and future actions which actors may consult as a referent. On the other hand, however, they may play the strong role of a 'script' that offers a precomputation of interdependencies among activities (options, required actions, sequential and temporal constraints, etc.) which, at critical points, provides instructions to actors of possible or required next steps" (Schmidt, 1999; p. 326).

Schmidt also shows that understanding plans as normative devices helps understand that using plans does not necessarily require endlessly interpretative work, as Suchman (1987) asserts. In fact, if plans are conceptualized as normative devices—that is, "as prescribed or agreed–to courses of action" (Schmidt, 2011b; p. 371-373)—, it is possible to understand that they can "lay out a sequence of work that is then blindly [*followed*]" in that they "provide criteria for what is correct and what is not, what is right and what is wrong" (Schmidt, 2011b; p. 373).

> "Most of the time [plans] are routinely applied as unproblematic guidelines or instructions, and if plans do not lay out a sequence of work that is then normally followed without reflection then there *are* no plans as we ordinarily understand the term" (Schmidt, 2011b; p. 386).

Schmidt has engaged in critical analysis of Suchman's work to warn researchers against adopting a preconceived understanding of plans when studying cooperative work in order not to miss its specificities, and therefore to be able to devise technology capable of contributing to the regulation of cooperative dynamics in work settings. But, even though they show opposite aspects of plans, both Suchman and Schmidt carry out their study of them by appealing to the same understanding of plans—that is, as expressions of instructions. This would not be a problem if plans were studied drawing on other conceptualizations as well, which is not the case, as CSCW studies on plans and planning show. In fact, even though they approach the study of plans differently, they always focus on the kind of efforts that plan executors have to, or do not have to, engage in, so as to understand the content of plans and apply them in situated work

circumstances. In other words, research on plans focuses on how the incompleteness of plans is faced in the execution of actions in that plans, like as all rules or instructions, are indexical in nature. As a result they provide limited understanding of plans and planning. It seems that Suchman's arguing against the cognitivists' assumption about plans by equating them with instructions has not only generated new dogma about the nature of plans, but also about the way plans can be conceptualized—that is, that plans can be studied as anything but instructions. But, even if it is true that instructions are often materialized in plans, there is no need to study plans only in these terms. On the contrary, it is necessary to overcome this monotonous tendency to catch specificities of cooperative work that have gone unnoticed before. This is why this project aims to contrast such a mainstream understanding of plans and planning. Moreover, this research aims to reverse another tendency in the study of plans and planning that, again, seems to be an unintended legacy of Suchman's demolishing the cognitivist paradigm. In fact, it seems that her limiting her argumentation to the relationship between plans and action has informed an entire stream of research that, either by confirming or criticizing Suchman's work, does no more than focus on the plan-action dyad without broadening the investigation into this relationship to possible links between plans and other features of their context of use. In other words, plans are mainly studied as if they were freestanding—that is, as if they could not be used or set up while drawing on the information content provided by other artifacts that inhabit the settings in which they are employed.

This project tackles this endeavor drawing on the concept of 'instructed action'—that is, by studying plans as instructably reproduced (Garfinkel, 2002)—, to unveil aspects of planning that were previously unnoticed. Plans and planning are studied here not to show the kind of methods that are necessary to work out the incompleteness or ambiguity of plans to act in a planful manner, but by looking at the methods used by planners to enact, and to make recognizable as such, projected planning outcomes by means of competent use of instructions for the plan setup and change.

1.2 Instructed actions

The term 'instructed action' coined by Garfinkel (2002) addresses the sociological problem of how instructions are used to enact the projected outcomes they entail.

> "It's not any old thing about instructions and following instructions that I want to tell you about. Instead, it's something I'll call my tendentious use of instructions, and my tendentious use of following instructions …By tendentious I mean that I want to talk about them with an abiding and hidden tendency" (Garfinkel, 2002; p.197).

The concept of 'instructed action' thus refers to the need to understand instruction-following as depending on the capability to anticipate relationships between courses of action and their projected outcomes. Garfinkel (2002) and Amerine and Bilmes (1988) explain this point as follows:

> "The documentary method of interpretation makes similar provisions for a practice of following instructions, where the *in vivo* search with the document in hand is for the pattern that underlies the details, the pattern that is definitely there, where the pattern that is definitely there is a detail of that pattern, and the work of searching with the document is anticipating or building the pattern, 'using' the pattern to explicate the detail as the detail-of-the-pattern. You can speak either of seeing the detail-in-the-pattern or the pattern-in-the-detail" (Garfinkel, 2002; p. 203).

> "Yet it is only by inferring some sort of pattern that the necessarily incomplete nature of instructions can be developed into a coherent course of practical activity; that unavoidable ambiguities and unforeseen contingencies can be resolved appropriately; that one can distinguish that which is essential from that which is nonessential in the instructions; and that one can decide whether any particular action among the virtual infinitude not specified by the instructions might facilitate, interfere with, or prove totally unrelated to the outcome" (Amerine and Bilmes, 1988; p.331).

In other words, the concept of 'instructed action' helps understand instruction-following as "a process of bringing reality to anticipation" (Rawls, 2005; p. 178) and projected outcomes as fruible only when the sequence of their enactment has been completed.

> "In order to bring any projects to fruition, Garfinkel realized that people would have to have some methods for doing so" (Rawls, 2005; p. 178).

Moreover, instructed actions are situated actions in that the relationship between

instructions and foreseen outcomes can be understood taking into consideration the local circumstances of their enactment. Rawls (2002) explains the concept this way:

> "The actor needs to accomplish the task in such a way that the result is a recognizable event, or a usable product. They must recognize various things as relevant to the task. The rules, or instructions, can't explain how to accomplish this recognition, and the result cannot be only conceptual or approximate. The exercise is an embodied one. The situated social actor inhabits a body that is oriented in space and time. The objects that need to be manipulated in the following of instructions are also situated in space and time. They are, as Garfinkel says, oriented objects" (Rawls, 2002; p. 43).

This also means that executing instructed actions depends on deploying competencies that are not explained in the instructions but that are nonetheless essential to its successful accomplishment. Apart from this, instructions gain meaning in the course of their use due to how they relate to one another during of the in vivo achievement of the desired outcome as it emerges in Garfinkel's (2002) explanation of the concept of instructed action, which he applies to the assembly of a chair following chair assembly instructions.

> "The diagram's very own significant details, and thereby reading it of the page to find what I am doing in following the diagram, to bring it to a description of the chair that will have to be assembled, by following the diagrammed instructions to do so—that when and if I encounter an equivocality of the diagram I can wait for something later to happen with which I will possibly have seen what it was diagramming that was relevantly there to be seen all along and was seeably there in the first place" (Garfinkel, 2002; p.203).

From this it is also possible to assume that, since following instructions implies recognizing the things that are relevant to the task in light of the pursued objective, it needs to be conceptualized as a competent endeavor (on this point also see Mondada, 2014). Moreover, as Garfinkel (2002) shows, the mutually determinative nature of courses of action and their outcomes makes instructed actions accountable actions, in that accounts can be provided to show that actions have been accomplished according to the instructions. In Amerine and Bilmes' (1988) opinion it is possible to say that instructions are 'prospective accounts' in the sense that:

> "If the experiment is 'successful', if it achieves its projected outcome, the instructions serve as an account of 'what was done' although in any actual

> performance a great deal more is necessarily done that can be comprised in the instructions" (Amerine and Bilmes, 1988; p. 329).

The concept of 'instructed action' also helps put the focus on the methods deployed to make instructed actions reproducible over time—that is, in "transparently achieved, embodied, customized, locally analyzable, locally historicized, rule-governed activities" (Garfinkel, 2002; p. 213)— and to the kind of efforts people make to ensure the praxeological reading of instructions over time and space when a collective is involved.

> "In endlessly many disciplines, as local occasion demands, practitioners are required to read descriptive accounts alternately as instructions. They do so occupationally, as a skilled matter of course, as vulgarly competent, specifically ordinary, and unremarkable worksite-specific practices. These are chained bodily and chiasmically to places, spaces, architectures, equipment, instruments, and timing. Within a discipline, practitioners require such competence of each other, not exclusively but centrally just in any actual case, and then unavoidably and without remedy, passing, evasion, or postponement. When occasion calls for a division of work, practitioners can be found to concert their efforts to assure a praxeological reading its recurrent, smooth, uninterrupted achievement by the culturally and organizationally local staff of its production" (Garfinkel, 1996; p. 19).

In summary, as Amerine and Bilmes (1988) effectively explain:

> "Dealing competently with the instructions requires not just the apprehension of bare imperatives, but an understanding of general relationships and possible connections between a projected outcome and a corresponding course of action, of which the instructions are indexical. This indicates the reflexivity, or the mutually determinative nature of the course of action and its outcome, in which are grounded the meaningfulness and coherence of a set of instructions" (Amerine and Bilmes, 1988; pp. 337–338).

1.3 Applying the concept of instructed actions to planning in the RCT

The dissertation is based on analysis of empirical material, collected in the ramp control tower (RCT) of an Italian airport—where the team at work set up plans for allocating parking areas for aircraft and gates on a daily basis— through ethnographic study of the setting. The operators of this service plan the use of the parking areas for aircraft (the stands) and gates, taking into consideration the sequence of flight arrivals and

departures, as defined by airline companies and the technical features of stands and gates, to ensure that each aircraft on the ground has an appropriate parking area at its disposal for the length of its stay on the ground and that each flight has a proper space at its disposal for carrying out boarding procedures. The RCT set up such plans to have ready-to-use solutions to apply while executing flights and to provide the plans to all concerned stakeholders in advance. Indeed, the plans set up in the RCT play a key role in the coordination of airport activities in that they permit the convergence of personnel involved in assisting the plane on the ground (bus, fuelling, and tow truck drivers; ramp agents; utility workers for aircraft cleaning and luggage loading and unloading; drivers of follow-me trucks and belt-loader vehicles) upon the planes' arrival, the convergence of airport personnel and passengers at the gates and has an impact on the orderly movement of aircraft on the ground.

The RCT operators plan the use of stands twice a day, monitor whether these planned solutions remain useful despite last-minute changes in the number and/or timetable of scheduled flights, and modify the plans as necessary. The plan setup is organized in stages of necessity in the sense that the operators access the necessary information at different times of the day. As a result, the stand allocation plan setup can be defined as a distributed activity, as the plan is the result of layers of decisions that several actors make in due time, drawing on several artifacts that provide different representations of the status of stands, gates and flights that support the allocation of stands and gates, while managing several other activities such as communicating with ramp personnel, crews, and air traffic control operators, and registering flight data. Therefore it is possible to say that the operators of the RCT are the plan builders and the plan executors at the same time in that they are directly involved in planning-in-advance but also, and of necessity, engaged in constant updating or 'planning-on-the-hoof' in order to manage the contingencies that arise. The RCT thus can be considered as a perspicuous setting (Garfinkel and Wieder, 1992) because it provides a researchable organization of activities that enable the examination of planning and plan use. As explained earlier, the research project explains planning and re-planning in the RCT in terms of 'instructed actions'.

To explain the concept of instructed actions, Garfinkel draws on several examples, one of which is assembling a chair by following instructions. As ten Have (2004; p.153) summarizes, he uses "a collection of parts [—the parts of the chair that need to be fitted together—]; a set of [visual] instructions and an image of the object to be constructed [the assembled chair]" and observes how he succeeds in building the chair. Drawing on this example, here it is suggested that it is possible to study planning work in the same way, replacing the components of the chair with the components of planning and re-planning in the RCT as follows: the parts that need to be fitted together are the stands and gates; the instructions are represented by the flight schedule that dictates the sequence in which flights will be executed, the instructions that specify possibilities and limits in the use of stands and gates as well as safety and security requirements; while the image of the object to be constructed is a plan in which each flight is properly settled. Planning and re-planning are therefore studied as the process of coupling flights with stands and gates by focusing on how the allocation of stands and gates makes it possible to maintain a consistent relationship between instructions and lived events. This way it is possible to access the role that plans have in creating an accountable relationship between instructions and the material, and contingent conditions of work, and ultimately to explain how work is accomplished in an orderly manner through plans. In other words, the focus here is on the way actions are anticipated by means of the competent use of the orders that regulate work. The reference to the concept of 'instructed action' lies in its highlighting the reflexive relationship between instructions, outcomes, and the corresponding courses of action. Hence plans and planning are studied here to understand the practical skills and the background knowledge through which it is possible to make planning projected outcomes usable—that is, the methods adopted to make plans intersubjectively recognizable as having been done well. To put it differently, plans are studied here in terms of how they are carried out and maintained as working tools across individuals, time, and environmental changes. Since the concept of 'instructed action' presumes a reflexive relationship between actual courses of action and instruction outcomes, it makes it possible to present the planners' work as the competent enactment of shared expectations about the use of institutional prescriptions.

This is why this research will explain plans as the outcome of instructed actions by going into how planners set up plans that ensure the temporal coordination of the flight and handling activities, and the management of unexpected events, since data shows that competent planners understand that instructions for the plan setup and change have to be used to reach such projected outcomes.

Moreover, since this concept helps to understand how to anticipate the relationship between courses of actions and their outcomes as a situated accomplishment, conceptualizing plans in terms of instructed actions encourages one to look at the capability of plans to anticipate events as a situated and practical accomplishment as well, and to understand how the material aspects of the context of their set up and use are involved in making plans that can anticipate events.

The planners' methods that are necessary for transforming anticipated planning projects into mutually intelligible objects—the plans—are investigated here by focusing on the RCT operators' planning and re-planning practices, in that the study of planning in terms of practice helps to catch the kind of shared expectations that are necessary for the RCT to allocate stands and gates properly; the way competent actors meet shared criteria of correct conduct and make the smooth and uninterrupted praxeological use of instructions possible (Nicolini, 2013; Schmidt, 2014). Moreover, in light of the 'linguistic turn' (Wittgenstein, 1958; Derrida, 1967) within the social sciences, this research takes language as the most relevant symbolic resource people draw upon to accomplish social reality. In that, as Francis and Hester (2004) clearly explain, this research recognizes that:

> "The linguistic representation is never neutral, [in that it] never simply corresponds to the extra-linguistic nature of that which it represents … [:] meaning does not flow from object to sign, but rather the other way round: signs impose meaning upon that which they represent" (Francis and Hester, 2004; p.11).

In addition this research acknowledges language as a form of action—that is, as a way to produce changes in the material or social context in which it occurs.

In summary, this research was developed to answer the following research questions:

RQ 1 How are plans set up in the RCT?

RQ 2 How are plans changed in the RCT?

1.4 Outline of the dissertation

Chapter 2 presents the theoretical background of the research project. Ethnomethodology is presented, cooperative work is defined, and the conception of social interaction and work that are at the basis of the research project are explained. The chapter also explains the concept of practice that is taken as the unit of analysis of work. Chapter 3 presents an excursus on the studies that have advanced the understanding of the use of plans and planning in work settings. The chapter also provides an overview of studies on artifacts used within airports and air traffic control to show how plans have been studied in such settings and reviews studies on planning as 'talk work'—that is, as a work mainly carried out through talking. Chapter 4 explains the research design. It presents the researcher's paradigm, an overview of the conceptualizations of the methods used to collect and analyze the empirical materials and the trustworthiness criteria for research. It also provides an extensive description of the setting and shows the method adopted for data collection and the process of data analysis. Chapters 5, 6, 7 and 8 present the results of research. Each chapter presents practices adopted to ensure the praxeological validity of the plans and explains the implications of this analysis for understanding the use of plans. Chapter 5 shows the kind of work that is necessary to set up plans capable of ensuring the timely assistance to planes. This way it integrates current understanding of the role of plans in temporal coordination that acknowledge that plans are difficult to use as temporal coordination devices. Managing the unexpected is taken to be another important factor for ensuring that plans are usable. Chapter 6 shows that achieving this goal depends on a set of planning and re-planning practices oriented to maintaining slack resources over time, and to preventing airport personnel overload. The chapter therefore puts forward the need to reconsider the claims of theories that claim that plans and

planning are inapt for managing the unexpected or that claim that plans treats the organizations' ability to face it. Chapter 7 addresses the understanding of how the ability of the stand and gate allocation plans to anticipate courses of action is maintained despite changes occurring in how planned events are executed. It shows that detecting the necessity to re-plan, and the way to solve re-allocation problems, are highly artifactual and interactionally-mediated, thus showing that anticipation, which is the key feature of plans, can be conceptualized as a situated, dynamic and artifact-mediated activity. In this the chapter is inspired, rather than directly informed, by the concept of instructed action. Chapter 8 goes into the study of planners' interactions to explain re-planning as the effort to meet the outcomes of re-planning instructions with the occurrence of local contingencies. The chapter tackles this subject by focusing on the role of talk in this process, since re-planning in the RCT is a talk work—that is, it is a work mainly carried out by talking (Piccini, Carassa, Colombetti, 2006). The RCT operators' talk is analyzed by drawing on the conceptual apparatus developed within membership categorization analysis (MCA) studies (Sacks, 1972a, 1972b). In that, the analysis of re-planning aims to expand research on the understanding of how decisions about how to change plans are made. To help with reading the dissertation, chapters 2, 3, 4, 5, 6, 7 and 8 are introduced by a short presentation of the themes that are covered. The last chapter summarizes the results of the research and reflects upon their implications for CSCW scholars and designing CSCW systems.

Transcription conventions

.	Falling intonation
?	Rising intonation
,	Flat or slightly rising intonation, talk which sounds incomplete
(2.0), (0.5)	Silence measured in seconds and tenths of seconds
word_word	Bounded words
(xx)	Incomprehensible talk
Word/word	Speaker's self-correction
[writing]	Description of non-talk actions occurring during the talk
<u>word</u>	Louder talk
=	No break or gap between turns of talk
Pronunciation of numbers	
1	One
9 8 7 5	Nine eight seven five
12	Twelve
References of numbers	
9 8 7 5	Flight number
12	Stand number
11	Gate number
21	Time (hours and minutes)

2. Theoretical background

To date the relationship between plans, planning and action has been investigated within several disciplinary areas that include, to name just a few psychology and sociology, artificial intelligence, and organization studies. Even though they have different objectives and methodological approaches, it is possible to say that all these studies share the same interest: understanding the relationship between plans, planning and action. This research is no exception, as it tries to shed light on how plans support action and takes a precise theoretical and methodological stance on the topic. In order to position the research project within this broad disciplinary landscape, it is worth explaining both the theoretical and methodological background that informed data collection and analysis. To begin with, this is qualitative research, which is ethnomethodologically informed. It is a sociological inquiry of a special kind, interested in understanding a specific aspect of planning and the use of plans, namely the use of plans to support cooperative work. But since this little bit of information does not help much with understanding what the research is about, the following chapter is devoted to clarifying what ethnomethodology and 'cooperative work' are, and to explaining the conception of social interaction, talk, work and practice that are at the basis of this research project. Moreover, it is important to understand that this chapter provides the basis for understanding that the methodological approach to data analysis, which will be illustrated in the following chapter, is consistent with the investigative perspective that informs the research project.

2.1 Ethnomethodology in short

Ethnomethodology (EM) is the term coined by Garfinkel to describe inquiry into "[people's] methods for making their activities visibly-rational-and-reportable-for-all-practical-purposes" (Garfinkel, 1967; p. vii). EM, therefore, can be defined as a

particular way of studying social life that, strongly influenced by Schutz's phenomenology and Parsons' sociological theorizations (on this point see Heritage, 1984), analyzes how people create and maintain social order—that is, intelligibility in social life. So the term 'ethnomethodology' refers to neither a method nor a theory, but to a specific way of studying society, language, and social interactions, in that it is particularly concerned with how people produce social life 'from within', making it observable. In other words, EM is concerned with "the local, each-time-again, embodied character of practical order-producing activities" (ten Have, 2004; p. 152); with the 'just this-nesses' or the haecceities of actual activities (Garfinkel, 2002). EM therefore, as Francis and Hester put it (2004; p. 18), assumes that members of a society possess "practical working knowledge of how to [accomplish] social activities", and seeks to describe how such knowledge is deployed in specific instances. EM also conceives members' interactions as "[intrinsically] socially structured, in the sense that, the character of the action produced by Person A 'conditions' what can be done in response to it by B" (Francis and Hester, 2004, pp. 4-5). Thus EM is neither interested in the individuals' subjective dimension, nor in conceptualizing social actors as 'judgmental dopes' who automatically or blindly enact the scripts of their culture (Garfinkel, 1972). Its focus, instead, is the study of how such structures are competently used by social actors to accomplish their social activities.

> "The structures involved are not invented on the spot … but neither are they reproduced 'mechanically' … One's social competence consists in the ability to use these structures in producing and making sense of social interaction" (Francis and Hester, 2004, pp. 4-5).

In other words, EM is a way of conducting sociological analysis that attends to the study of how actors themselves construct and make sense of social activities. By doing so, ethnomethodologists make the key assumption that members of society have a practical working knowledge of how society works, and that they use this knowledge, and rely on the assumption that others do the same, when producing social activities.

> "The production of observable social activities involves the local or situated use of methods by which members of society are able to observe and recognize what is happening around them, and thereby know what they should do to fit their

actions together with the actions of others" (Francis and Hester, 2004, pp. 20-24).

To summarize, the focus of EM is not the study of individuals, but people s ability to be competent participants in social activities—that is, "the methods by which members of society are able to observe and recognize what is happening around them, and thereby know what they should do to fit their actions together with the actions of others" (Francis, Hester, 2004; p. 24). In other words, EM is a way of conducting sociological analysis that attends to how social activities are methodically accomplished to understand members' knowledge and competence in accomplishing everyday activities.

The peculiar way of understanding and studying the organization of society put forward by EM can be traced back to the terminology used by ethnomethodologists and the meaning attributed to it. The term 'actor' or 'member', for example, does not refer to the biological features of a person, but to the competences that are necessary for him/her to participate in ongoing activities "as a *bona-fide* member of a collectivity" (ten Have, 2002; p.20). Ethnomethodologists refer to people' s organizing their actions to make them reciprocally recognizable in terms of 'accountability'. Actions are inherently accountable in that they are taken to be publicly observable and identifiable within the social setting in which they are deployed. The meaning of this notion can be associated with "intelligibility or explicability in the sense that actors are supposed to design their actions in such a way that their sense is clear right away or at least explicable on demand" (ten Have, 2002; p. 20). As a consequence, understanding the production of social order can be achieved by investigating how people accomplish their actions to permit others to understand them as part and parcel of the complex sets of activities necessary for the production of everyday social facts, as well as work activities. EM understands actions of any kind, such as participating in a team meeting, waiting in a queue or reading a book, as the building blocks of social life, and it considers them socially accomplished in that they are done to be recognizable to the other members of society regardless of whether they are conducted collegially or individually. Actions are considered fundamental for the orderly accomplishment of social interactions at any level of granularity. This is why understanding how turn-taking during a telephone call

is managed is worth pursuing, as well as the study of how complex work activities are accomplished.

The term 'context', on the other hand, refers to the situation in which social interactions occur. As such, context is defined by the physical or social context which participants orient to while accomplishing social actions. As a consequence, the physical or social context cannot be taken as 'buckets' that contain interactions, but as endlessly enacted. It is the situated orientation towards certain physical or social structures made evident in people's actions that determines the interactional possibilities for all involved. From this perspective even the relevance of artifacts depends on members' mutual orientation towards them along an organized sequence of interaction.

> "Social objects are not just there; they must be mutually oriented. They must be rendered in a mutually intelligible form in order to exist as social objects" (Rawls, 2008, p. 713).

For interactions to take place people must understand what is going on. This mutual understanding is achieved by individuals who interpret words and actions in the context of their occurrence as what they seem to be. From the EM perspective, in fact, people's sense-making practices draw on the 'documentary method of interpretation'—that is, on actors' coherently assembling:

> "An array of particulars by interpreting them in terms of an underlying pattern. The particulars are taken as 'indexing' to such pattern so that it is employed to render the particulars identifiable as a related homologous collection" (Watson, 1997; p. 55).

In his later writings Garfinkel (2002) addresses the problem of how people assemble coherent actions in terms of instructed actions—that is, in terms of the reflexive relationship between instructions and the actual activities to which these instructions refer.

EM also recognizes that the meaning of words and actions depends on members' making their actions intelligible to others while acting.

> "We have here, then, two sides of sense making: members of society make sense of what they observe and they produce talk and action in ways that enable definite sense to be made of what they are doing. These two aspects are really one: sense making is not something detached from action, rather sense is made in action, in the very situations that members of society find themselves and with which they have to deal by acting in this or that way" (Francis and Hester, 2004; p. 24).

Sense-making is not only the outcome of the way people act or talk, but also depends on the contextual circumstances in which they occur. EM, in fact, recognizes that if the sense of words and actions can be worked out in real time and in a quite unproblematic way while participating in social activities, despite the fact that actions and words might have several possible meanings when taken out of context, it is thanks to the fact that their meaning is worked out with reference to the circumstances of their use. Since the meaning of words and actions depends on the circumstances of their use, EM conceptualizes them as 'indexical' in nature.

As explained above, EM recognizes social interactions as structured, in that each accomplished action projects which actions should be performed next, like questioning predicts answering. Ethnomethodologists understand the structured character of interactions in terms of 'reflexivity' and 'sequentiality'. The term 'reflexivity' refers to the forward-backward character of interactional exchanges (Rawls, 2005; p. 172). Reflexivity therefore refers to the fact that each action calls for the next move, so when a new thing is said, done, or seen after the previous one, this reflects back on the last thing said or done, with the potential of showing it in a new light. At the same time, each action calls for a next new move. Thus the reflexive character of interactions enbles the actors' mutual display of their own understanding of what has been said or done before, so that "meaning emerges over a sequential course of utterances" (Rawls, 2005; p. 182). The term 'sequentiality', instead, refers to the time dimension constitutive of interactions and of the presentation of identities. Sequentiality then refers to the fact that people' s interactions are enacted in an orderly manner—that is, that actions are taken, or things are said, following one another (Rawls, 2005; p. 170).

The term ‘group’, on the other hand, is used to refer to a set of people mutually engaged in enacting a situated activity (Rawls, 2008). This is functional to tackling one of the main EM research questions, namely understanding how collective activities influence individuals in terms of organizing their own activities so as to interact with others.

> “While individual workers have individual tasks to perform, they are also, and necessarily, individuals-as-part-of-a-collectivity, and much of their work consists in the ability to organize the distribution of individual tasks into an ongoing assemblage of activities *within* a ‘working division of labor’” (Randall et al., 2007, p. 133).

The term ‘culture’ addresses the study of ‘culture in action’ (Hester and Eglin, 1997)—that is, the understanding of how culture is accomplished in talk and actions.

> “Rather than treating some utterance as a manifestation of an underlying attitude, [ethnomethodologists’] concern is with how cultural knowledge is displayed and used in the specifics of social situations and activities, so as to accomplish those situations and activities. Thus shared culture is not something that lies behind people’s talk and action, neither should it be conceived as a disembodied system exercising explanatory force over that talk and action. Rather, shared culture is accomplished in and through the making of observations of sameness and difference. Persons ‘recognize’ their sameness with others by seeing that others think or act in the same sorts of ways as themselves. Culture, therefore is an accomplishment of talk and action, not a determinant of it” (Francis and Hester, 2004; pp. 30-31).

From the methodological point of view, EM prefers investigating how members deploy the practical working knowledge they have of how society works while accomplishing social actions. At the beginning Garfinkel did this by setting up breaching experiments to uncover the “seen but unnoticed, background features of everyday scenes” (Garfinkel, 1967; p. 36) but then ethnomethodologists turned to the study of the details of the accomplishment of activities in that they are seen as intrinsically structuring social actions. In any case, observing social activities does not involve conceptualizing observation as a sociological technique, in the sense that ethnomethodologists contend that observation is necessary to accomplish everyday social activities. Indeed, the ethnomethodologists’ capability to observe social fact depends on their being members of society because it is their membership of society that enables them to make sense of social life.

> "Ethnomethodology argues that there is no genuine choice to be made between viewing social life 'from within' and 'from without'. The sociologist is first and foremost a member of society, and his or her ability to describe social life in any way at all is made possible by that membership" (Francis and Hester, 2004; p. 210).

Following the Sacksian critique of interview data (Sacks, 1992, vol. 2; pp. 30-31), ethnomethodologists usually prefer to observe naturally occurring activities, rather than accounts of them, because it is the observation of such activities, more than their members' descriptions, that makes the details of interactions available for inspection. Sacks, in fact, highlights that interviews enable for the study of accounts of mundane sense-making work which is not equivalent to investigating how such sense-making is accomplished through members' carrying out everyday activities.

As Francis and Hester (Francis and Hester, 2004) clearly summarize, ethnomethodologists base their investigation on the social phenomena towards which participants are oriented, and that are relevant to them in specific and situated actions, to question how observable features of the activities under scrutiny are produced as they are and to identify the methods through which those activities are made as recognizable. In addition, ethnomethodologists are committed to attending to the demonstration that participants are actually oriented towards the phenomena they identify as members' methods.

> "For some phenomenon to qualify as a members' phenomenon it has to be capable of being shown to have been taken into account and used as grounds for the production of that activity" (Francis and Hester, 2004; p. 29).

Moreover, ethnomethodologists are not interested in describing what people would do in the abstract, but in paying attention to how things are done, or words are said within the occasion of their being said or done. This implies that generalizing the results of research or the production of theorizations about the functioning of society, are outside the scope of ethnomethodologists' main concerns. On the contrary, ethnomethodologists might even focus on a single manifestation of order if this helps to pinpoint how cultural knowledge is employed in specific social situations. Last but not least,

ethnomethodologists are committed to ensuring the inspectability of their claims by drawing out research reports that make the details of their observations available.

2.2 EM-oriented studies on work

EM, given its particular way of studying social order and its refusal of "any epistemological or ontological commitments except those used by people in their practical affairs" (Randall et al., 2007; p. 126), has been often misunderstood (Peyrot, 1982) and criticized even from within the ethnomethodologist community (Atkinson, 1988). Nevertheless, EM has contributed remarkably to the understanding of two social activities that are of particular interest here, namely work and communication. Indeed, EM-oriented studies of work have contributed to understanding how scientific work is accomplished (see Garfinkel, Lynch and Livingston, 1981; Livingston, 1986; Lynch, 1997a), but have also impacted on currently mainstream studies of work, namely workplace studies (Luff, Hindmarsh and Heath, 2000), organization studies (Llewellyn and Hindmarsh, 2010; Samra-Fredericks, 2003), practice-based studies (Schatzki et al., 2001; Nicolini, 2013) and studies of cooperative work (Hughes et al., 1991). Whatever they are applied to, EM studies are recognizable due to their interest in how complex activities are accomplished; for devoting particular attention to work in its materiality as a locally constructed and negotiated activity, and collecting data by means of audio or video recordings to catch details of observed activities and, through that, to understand the intelligibility of these actions for participants.

> "What ethnomethodologically informed studies show is that apparently 'ordinary work' consists of things that might not be easily imaginable ahead of time … EM studies … take what appear to be mundane or routine activities …*seriously"* (Llewellyn and Hindmarsh, 2010; pp. 13-15).

Put differently, studying work from the EM perspective consists of paying attention to how work gets done, because ethnomethodologists consider the orderly accomplishment of work not as something that can be assumed, but instead as being systematically achieved by actors in the moment-by-moment flow of work.

In Garfinkel and Wieder' s opinion (Garfinkel and Wieder, 1992) EM studies catch 'what' makes up a particular kind of work—that is, the details and intricacies of working practices that constitute each type of work and that make each work activity recognizable for what it is. Garfinkel and Weider (1992; p. 182) claim that understanding work is possible when the researcher gets 'vulgarly competent' in the setting under scrutiny. This means that researchers should understand the setting as the practitioners do, and be able to describe it in the practitioners' language. Researchers need to acquire an extensive understanding of the fieldwork; a competence in the field of interest that exceeds mundane competence to be able to grasp the 'whatness' that makes a particular work activity what it is.

2.3 EM-oriented studies on communication

EM-oriented studies of language are characterized by their interest in language-in-use. In particular, these studies are interested in understanding how people through talk, interact to accomplish social activities. The focus of EM-oriented studies of language therefore is not to understand the speakers' linguistic competence, but to study how people achieve interpersonal understanding through the actual performance of talk. Sanders (2005) recognizes ethnomethodologically-oriented studies of talk among the studies on communication whose main objective is to study how the meaning of what people say is recoverable from what they actually say to the people they address.

Two tenets are the basis of EM-informed study of talk: the principle that meaningfulness is systematically achieved by people so that it is possible to study the methods through which they interact with others, and the principle that meaningfulness is intersubjectively co-constructed. Meaning, in fact, does not simply depend on what a speaker says, but also on what the addressee makes of what was said in the subsequent talk. This implies that the meaning of words or utterances is seen to depend on the sequential organization of interactions, but also that talk is situated in character from the EM perspective.

> "The situated nature of language use means that what is said in any interaction is being said here and now in *this* situation, with *these* circumstances in mind and *this* interactional task at hand. The form of words that a speaker employs is tied to and displays the character of the local situation at hand" (Francis and Hester, 2004; p. 14)

The study of talk therefore has to be accomplished by looking at the real time interactions between people, and by looking at the details of talk to understand how they are practically used to "produce socially meaningful actions and achieve (or fail to achieve) mutual understanding" (Sanders, 2005; p. 5).

Studying language from the EM perspective can be seen as the study of language as action, in that utterances are studied as produced and interpreted, "as having been intentionally produced in just that way for just that auditor at just that sequential place for the sake of its resulting functionality" (Sanders, 2005; p. 7). This means that talk is studied as produced to accomplish some change in material or social conditions and "produced with the intention of having that effect" (Sanders, 2005; p. 7). However, this does not mean that the study of talk-in-interaction consists of studying intentionality as a mental state, but instead as it is displayed in the way talk is accomplished and as it is intersubjectively achieved.

Sacks (1992), applying the principles of EM to analyzing talk, shows that the intelligibility of discursive interactions depends on both their sequential structure and on how common-sense knowledge is organized in terms of categories employed to accomplish social activities through talk. His seminal work has originated two main full-fledged streams of research in the study of talk: conversation analysis (CA) (Sacks, Schegloff and Jefferson, 1974)—that is, the study of the locally-achieved temporal organization of conversations (Fele, 2007)— and membership categorization analysis (MCA) (Sacks, 1972b), the study of how "the presumed common-sense knowledge of the social structure" is organized around descriptions of people and objects and used locally (Hester and Eglin, 1997; p. 3). It is also worth remembering that the CA approach has originated a stream of research between understanding work and talk, known as the 'institutional talk program' (Drew and Heritage, 1992) which aims to study how

particular institutional goals are achieved through talk, and how professional and/or institutional roles, identities, values, beliefs and rules are enacted through talk.

2.4 Cooperative work

Cooperation is the basis for accomplish innumerable activities, such as dancing or playing football, but is also recognized as being the basis for accomplish collective work. Cooperation is thus a widespread endeavor but also a subtle phenomenon. In fact, as Schmidt (2000; p. 145) notes, cooperation is difficult to disclose, in the sense that "the individual activities of cooperating actors are *made to appear as if* they are seamlessly integrated and meshed". Thirty years ago, the need to know more about cooperative work, and in particular to understand the causes of the disastrous application of software for office automation, originated an interdisciplinary scientific community focused on software design: Computer Supported Cooperative Work (CSCW), which quickly recognized that it is the lack of knowledge about how groups work and about how technology affects them, that undermines the success of system design efforts. Over time, these scholars have enriched our understanding of cooperative work by drawing on different theoretical perspectives, such as actor-network theory (Callon, 1986; Latour and Woolgar, 1979), distributed cognition (Hutchins, 1995), activity theory (Engeström, 2000; Nardi, 1996a), francophone ergonomics (De Keyser et al., 1988) practice-based studies (Schmidt, 2014), ethnomethodology (Shapiro, 1994) and participative design (Blomberg and Kensing, 1998). But what is cooperative work then? Drawing on Schmidt's original work, it is possible to cut the heart of the matter. Bannon and Schmidt (1989; p. 362) claim that the term 'cooperative work' can be used to describe "multiple persons working together to produce a product or service". More precisely, cooperative work is the work of people who are "mutually dependent in their work and are required to cooperate in order to get work done" (Schmidt and Bannon, 1992; p. 7). In Schmidt's opinion (1991; p. 2) one worker is dependent on another when he "relies positively on the quality and timeliness of another worker's work and vice versa". Because of these interdependencies, cooperative work imposes the division, allocation and interrelation of

different tasks on different members of the cooperating ensemble. Thus, cooperative work relations require workers to engage in coordinative activities that "are extraneous to the activities that contribute directly to fashioning the product or service" (Schmidt, 1991; p. 2). Following Strauss (1985), Schmidt calls this secondary task 'articulation work'. Articulation work is thus a costly activity in terms of labor, resources and time, which people engage in when they cannot accomplish the required task individually. Articulation work is thus what differentiates cooperative from individual work.

Bannon and Schmidt (1989; p. 362) also specify that cooperative work can include direct as well as indirect models of interaction. Cooperative work is conducted indirectly when it is mediated by "the changing state of the transformation process" while it is conducted directly when it is mediated by interpersonal communication. Cooperative work can also be conducted collectively—by a group or "in a distributed manner, that is, by an ensemble of semi-autonomous workers". In addition, Bannon and Schmidt (1989) state that cooperative work might create or sustain forms of group identity but that this is not always the case. A cooperative ensemble, in fact, can be inhabited by conflicting interests even though the presence of this diverging interest does not necessarily undermine the functionality of the collaborative system. Bannon and Schmidt (1989; p. 365) also notice that cooperative work develops historically and that it "[adapts] dynamically to the requirements of work", to the limits and resources available, and to unexpected contingencies. Cooperative ensembles thus need to be conceptualized as self-organizing in the sense that they are able to continuously negotiate the articulation of work. This can be seen clearly in complex and dynamic work environments featuring a high level of complexity and uncertainty. For this reason they suggest designing software systems that will support the self-organization of cooperative ensembles, instead of computerizing formal procedures. It is also worth mentioning Malone and Crowston's (1994) efforts to identify the kinds of dependencies that might exist between dependent subjects to identify the coordination processes used to manage them. Based on the interdisciplinary study of coordination, they identify four coordination processes: managing shared resources; managing the producer/consumer relationship; managing simultaneous constrains and managing task/subtask relationship.

Procedures, taxonomies, task allocation schemes, but also schedules and timetables are instruments for maintaining order within and between coordinative ensembles. They are resources that competent members use "to reduce the complexity of articulating distributed activities of cooperative ensembles" (Schmidt and Simone, 1996; pp. 163). In Schmidt and Simone's (1996; pp. 171-176) opinion all such artifacts are coordination mechanisms composed of two basic elements: coordinative protocols—that is, established conventions but also standard operating procedures with coordinative function— and coordinative artifacts that provide the stable representation and structure to data. Coordinative artifacts therefore are:

> "Protocols encompassing a set of explicit conventions and prescribed procedures and supported by distinct artifacts with a standardized format, that stipulate and mediate the articulation of distributed activities" (Schmidt and Simone, 1996; p.177).

The role of the artifacts in the coordination ensembles is thus "to provide persistence to the pre-computations of the protocol and to make them publicly available" (Schmidt and Simone, 1996; p.178). It is worth specifying that Schmidt and Wagner (2004) notice that even if one artifact were to correspond to one coordinative protocol, this is not always the case. Indeed there might be a case in which one protocol is not attached to any artifact that specifies its application, or that several artifacts are attached to the same protocol. Put differently, they suggest understanding coordinative protocols and artifacts as connected in an intricately recursive manner, "forming more or less tightly coupled clusters" they call "ordering systems" (Schmidt and Wagner, 2004; p. 402).

In Schmidt's (2011a; pp. 11-12) opinion understanding cooperative work as "actual observable conduct" is enabled by studying the kind of relationship that exists between interdependencies and by relating the work of the organization to the enacted arrangements of work in the sense that they "combine and deploy as the situation unfolds, on the basis of what is to be done, what it requires, who is ready, etc".

2.5 Understanding talk

Social life would be impossible without language because people can communicate and therefore live together thanks to language. Language, in fact, is used to carry out countless social activities such as questioning, asking for help, giving explanations, joking, and so on. Understanding communication and language is the basis of communication studies, which have engaged in this endeavor, taking different stances. Linguistics, for example, has investigated what makes the formation of sentences at the phonetic, grammatical, semantic as well as mental levels possible, while researchers in related disciplinary areas, such as ethnolinguistics, pragmatics and sociolinguistics have, respectively, investigated the relationship between language and culture; language and action, and language and society. Moreover, studies of language have approached understanding language by studying it as a situated accomplishment but also as an abstract system; as an individual but also as a social phenomenon, thus preferring to analyze different corpora, that is, invented sentences and actual occurrences of talk. So Chomsky (1975), for example, studies language as an abstract and individualistic affair as he conceives language as a mental phenomenon and examines invented sentences. Pragmatists, instead, who focus on the speaker's communicative intentions and the relationship between intention and action, study language as an individualistic phenomenon (Searle, 1969), as it is influenced by cultural conventions (Austin, 1962) or by the circumstances of talk (Wittgenstein, 1958) as well as a cooperative effort (Grice, 1957, 1975; Clark, 1996), drawing on the study of invented sentences. Sociolinguistics (Hymes, 1972; Duranti, 1997) understands language as a social action and draws on the study of naturally occurring talk. Among the studies that understand language as a social action it is also possible to recognize the EM-inspired studies of talk that, emerging from sociological investigation more than from a primary interest in the study of language, conceptualize language as a social phenomenon. They, in fact, are interested in understanding how language is used to accomplish social activities and investigate talk in its actual use, as language is taken to be the basis of people's capability to act socially. EM studies of talk thus are interested in understanding how social order is constituted by

understanding how people achieve the common context they need to act together. EM studies of talk investigate how participants make their discursive actions recognizable and, by reflex, recognize others' actions, to coordinate their joint activities. These studies, in fact, do not assume that recognizing social scenes is an automatic process, but instead that it is "accomplished through ongoing, moment-by-moment social and cognitive work" (Duranti and Goodwin, 1992; p. 28). EM-oriented studies of talk contend that discursive actions are recognizable and understandable because they are intrinsically structured. This means that each discursive action is understood for the action/s it projects and each response is understood for its meeting or not meeting some expectations in the particular context of its occurrence. In other words, each action conditions what can be done in response, like questions prompt answers and greetings prompt greetings. As Schegloff and Sacks (1973) show by studying adjacent pairs—that is, couples of utterances produced by different speakers and sequentially organized—, two-utterance sequences allow speakers to ascertain that they have common ground, which would otherwise be impossible.

> "By virtue of the occurrence of an adjacently positioned second, the doer of a first can see that what he intended was indeed understood, and that it was or was not accepted. Also, of course, a second can assert his failure to understand, or disagreement, and inspection of a second by a first can allow the first speaker to see that while the second though he understood, indeed he misunderstood … [moreover] whenever there is reason to bring attention to the appreciation of some implicativeness, 'next utterance' is the proper place to do that, and a two-utterance sequence can be employed as a means for doing and checking some intendedly sequentially implicative occurrence in a way that a one-utterance sequence cannot" (Schegloff and Sacks, 1973; p.75).

These structures, which are a researchable object in the sense that speakers have been shown to be focused on them during talk, are neither mechanically employed nor invented from scratch by speakers, but instead are competently used by speakers to produce and make sense of social interactions.

> "Ordinary speech does not involve the use of pre-set linguistic expressions. Rather, persons spontaneously produce talk that 'fits' the situation they are in, including the talk of others. They do so, then, not in a predetermined way but

> because the words used display a particular understanding of what is happening 'here and now'" (Francis and Hester, 2004; p. 13).

Context therefore plays a key role in understanding talk since the meaning of each word or sentence becomes multifaceted in relation to the circumstances of its use, but what is context? EM studies of talk do not conceptualize context as an already existing container of interactions, but instead as an ephemeral, socially and interactively constituted phenomenon. In Goodwin and Duranti's (Duranti and Goodwin, 1992; pp. 6-7) opinion it is possible to distinguish four dimensions of context which speakers are shown to oriented themselves toward when reconstructing the meaning of talk: the setting, that is, "the social and spatial framework within encounters are situated; the behavioral environment, that is, "the way that participants use their bodies and behavior as a resource for framing and organizing their talk"; language, that is, "the way in which talk itself invokes context and provides context for other talk" and the extra-situational context, that is, "the background knowledge that extends far beyond the local talk and its immediate setting". This implies that the study of interactions must include the study of all the participants' utterances, even of the grammatically imperfect ones, as well as the lack of talk, to understand the contextualization work carried out by speakers in local language use occurrence and to recognize how participants integrate all the aforementioned contextual features to make sense of other's talk (as well as to the lack of talk). But it is also worth noting that even if EM studies of talk recognize that the meaning of words and actions necessarily depends on the context of their occurrence, this does not mean that they recognize that actors are endlessly engaged in interpretation. Instead EM studies of talk recognize actors are able to easily recover the meaning of words in the circumstances of their use despite their indexical nature thanks to interpreting others' words based on what they look like.

> "[There is a] fundamental constraint that operates in all interactions … [:] that persons should, whenever possible, take things 'at face value'. In other words, one should respond to the actions of others on the basis of what those actions seem, obviously or plausibly, to be… This does not mean the persons do not make sense, but that most of the time such sense making is massively routine and unproblematic" (Francis and Hester, 2004; p. 7).

This also means that EM studies of talk recognize communication as a cooperative endeavor. The cooperative nature of communication has been recognized by several scholars. Tomasello (2009), for example, shows that infants structure communication cooperatively even in the pre-linguistic phase; Clark (1996) shows that, language use being a joint action, it can only be achieved through coordination, while Carassa and Colombetti (2009), renewing the Griceans' (1957; 1975) study of talk, show that the ability to create joint meaning is cooperatively constructed. In their opinion, in fact, joint meaning requires one speaker to provide affordances to commit to a joint project, and the addressee must take up this project. When both interlocutors collectively recognize that a certain illocutionary act has been produced, joint meaning, and therefore deontic relationships, are achieved and maintained.

EM-informed studies of talk contribute to understanding the cooperative nature of language by showing that speakers' mutual understanding is possible thanks to the participants' continuous orientation of one another. In fact, EM-informed studies of talk contend that the speakers' mutual understanding depends on speakers designing their talk to be understood by certain specific listeners—what Sacks, Schegloff and Jefferson (1974) call 'recipient design'—and on the listeners showing their understanding of what has been said. In fact, through the way listeners pay attention to speakers' words, speakers can understand whether they have been understood or not and therefore whether it is worth continuin their talk. This means that EM studies of talk recognize that speakers always show to be focused on their interlocutors' identities and how these identities are confirmed or contested in situated interactions through talk.

This brief excursus on the suppositions of the EM studies of talk aims to clarify the understanding of talk that is the basis of this research project, coherently with its being EM-oriented. Here it is recognized that focusing on the use of language is necessary when studying work because work is overwhelmingly performed through talk, and when the study of work is oriented toward understanding its situated, local and embodied character, talk needs to be studied as a practical vehicle for executing work—that is, as action, in its actual and local use, and focusing on participants' interactions. As such this

research project uses the term 'talk-in-interaction' (see Psathas, 1995) to address its analytic stance towards studying communication.

2.6 Studying work

As Schmidt (2014) notes, the concept of 'practice' is increasingly used within CSCW studies to understand cooperative work dynamics. In his opinion this is due to the fact that the term 'practice' helps "overcome the categorical separation of 'thinking' and 'acting' that is part and parcel of the received discourse about 'work'" (Schmidt, 2014; p. 427). But the term practice is multi-faceted in that it is not possible to identify a single practice theory. The term 'practice', in fact, has been used to allude to the "coordinate activities of individuals and groups [in doing their] real work" (Cook and Brown, 1999; p. 390) but also to "a perspective on knowing in practice" (Orlikowski, 2002; p. 249) or as "routine" (Orlikoski, 2000; Feldman, 2003).

This is due to the fact that studies of practices have been conducted drawing on different theoretical approaches such as historical activity theory (Engeström, 2000), ethnomethodology (Garfinkel, 1967), structuration theory (Giddens, 1984), Bourdieu's practice theory (1990) and situated learning theory (Lave and Wenger, 1991) to which Gherardi (2000) adds actor-network theory (Callon, 1986; Latour and Woolgar, 1979) and Schatzki (2001) the post-humanist studies (Wolfe, 2010). This is possible because, as Nicolini (2013; p. 1) notes, 'practice based studies' (PBS) are constituted by "a family of theoretical approaches connected by a web of historical and conceptual similarities" that in Schatzki's (2001) opinion share a basic understanding of practices as:

> "Embodied, materially mediated arrays of human activity centrally organized around shared practical understanding [… so that] knowledge, meaning, human activity, science, power, language, social institutions, and historical transformations [… are conceived as occurring] within and are aspects or components of the field of practices" (Schatzki, 2001; p.11).

In Corradi, Gherardi and Verzelloni's (2010; p. 268) opinion it is possible to recognize a historical evolution within the PBS that, in their opinion, has moved from

conceptualizing "practice as an empirical object" to conceptualizing practice as an epistemology: as "a way of seeing a context". They also maintain that practice theories have, to date, made it possible to develop the concept of practice along three axes, namely the "set of interconnected activities that stabilize collective actions", "the sense-making process that supports the accountability of shared ways of doing things" and "the dimension of the reproduction of practice" (Corradi, Gherardi and Verzelloni, 2010; p. 277). So, for example, activity theory has promoted the development of the first dimension, ethnomethodology of the second, and Boudieu's theory that of the third. Focusing on EM's contribution to PBS, it is noticeable, as Nicolini (2013) clearly explains, that EM contributes to the understanding of practice as an accomplishment.

> "EM investigate practices not as instances of something else (e.g. habitus, tradition, community, or mind), but as spatio-temporal accomplishments obtained by knowledgeable actors who use a variety of (ethno)methods, tools, techniques, and procedures" (Nicolini, 2013; p. 134).

Refusal of any pre-defined notion for studying practices is what Rawls (2008; p. 705) recognizes as making the difference between EM investigations of work and studies that focus on habits or routines in workplace settings as well. In her opinion, in fact, habits or routines are abstractions or generalizations of real events and, as such, these constructs obscure an understanding of the complex accomplishment of local order. These concepts, for example, do not help to understand how actors recognize that a certain routine is or is not appropriate in a certain situation, and how activities are carried out to look like they are recurrent and uniform (on this point also see Lynch 1997b and 2001). Llewellyn and Spence (2009), on the other hand, claim that EM might contribute to PBS in an original way by interpreting the understanding and study of practices as 'members' phenomenon'.

> "How some word, utterance or gesture embodies (or does not) a particular practice is studied as something that is available to members. Whether and how someone is acting within the parameters of a particular practice is something people monitor, participate in and can take a position on in real time interaction … The relation between the practice and activity is thereby understood to be reflexive in the sense practice is reproduced through ordinary activity, but at the

> same time practice is a resource that enables people to recognize and assemble situated activities" (Llewellyn and Spence, 2009; p. 1420).

This implies, as Llewellyn and Spence (2009; p. 1421) note, that practices can neither be detected by the analyst looking for regularities, nor studied on the basis of abstract reconstructions of work. In EM-oriented study of practice, no attempt is made to separate practice and real time interaction, either theoretically or empirically. Practices are studied by "singling out specific interactions". Moreover, they maintain that when practices are conceptualized as members' phenomena, the unit of analysis is of necessity "the shared ways in which people display what they are doing" (Llewellyn and Spence, 2009; p. 1421). This conceptualization of practices as intersubjective phenomena is coherent with Schmidt's (2014; p. 437) understanding of practice as "normatively regulated contingent activity".

> "When we observe stable patterns or correlations, what we find is mere regularity. But when we observe that actors justify their actions and their justifications are accepted (or rejected), or give and receive instructions on how to conduct themselves in a certain line of activity … we are finding instances of normative regularity" (Schmidt, 2014; p. 437).

Therefore, Schmidt continues, studying practices implies recognizing that they are constituted by certain rules and principles and looking at how such rules are applied in accordance with changing circumstances.

Allowing the study of practices to have access to the practical know-how of people at work, the data collection and analysis of this research project has been oriented towards identifying work practices, building on Llewellyn and Spence's (2009) conceptualization of practices as intersubjective phenomena.

3. Relevant current research

This chapter presents the most relevant empirical findings on plans and planning developed within CSCW studies and EM. This way the chapter, coherent with the research project's interest in understanding the coordinative functions of plans and planning, gives an account of all the strands of study of plans and planning that have been developed by CSCW scholars. Presenting the status of research relevant to the research project, helps to understand the kind of contribution it provides. In addition, the chapter presents a brief excursus on CSCW research on airport activities, on strategic planning, and on research on planning as a discursive activity to help position how data analysis will contribute with regard to interrelated disciplinary areas.

3.1 Plans and situated actions

The most relevant ethnomethodologically inspired study of plans is Suchman's (1987) study of the linkage between plans and situated actions. As Sharrock and Button (2003; p. 262) efficiently summarize, drawing on Garfinkel's (1967) understanding of rule implementation as a problem of determining their meaning, she highlights that plans cannot determine sequences of conduct in advance because they do not provide for their application which, instead, needs to be determined in the situation of their use. This way Suchman succeeds in demonstrating the inadequacy of the planning model of human action introduced by cognitivism. As Suchman (1987; p. 9) notes, that model locates the cause of action in mental processes: people "act on the basis of symbolic representations" that are manipulated to produce mental states that, in turn, produce behavior. This means that all mental processes such as ideas, desires and plans are mentalist constructions and that these abstract structures can be implemented in any physical substrate. As Suchman explains, cognitive scientists, for example, contend that their understanding of cognition can be tested using computers. If, in fact, mental

processes can be modeled on computers, producing the correspondent behavior, then the theory can be said to be valid. Plans, in particular, are taken to be "sequences of actions designed to accomplish a preconceived end" and prerequisites of action that prescribe it "at every level of detail" so that "mutual intelligibility is a matter of the reciprocal recognizability of our plans, enabled by common conventions for the expression of intent, and shared knowledge about typical situations and appropriate actions" (Suchman, 1987; pp. 27-28). From this perspective plans are always a prerequisite for action to take place, even when the occurrence of unanticipated conditions requires re-planning anyway. In contrast to this view Suchman proposes an alternative conceptualization of the relationship between intention and action that draws on EM. This approach, known as 'situated action' underscores the idea that "actions are always situated in particular social and physical circumstances so that the situation is crucial to the action interpretation" (Suchman, 1987; p. 178). In her opinion, the EM explaining the orderliness of the social world not as determined by projects, but by the reflexive constitution of common norms and the activities used in unfolding circumstances to enact them, makes it possible to understand that human actions can never be dictated by plans. The situated action approach thus recognizes that:

> "Since the circumstances of our actions are never fully anticipated and are continuously changing around us, our actions, while systematic, are never planned in the strong sense that cognitive science would have it" (Suchman, 1987; p. 178).

As a consequence, plans cannot be generative mechanisms of actions, but are artifacts of reasoning about action—that is, "weak resources for what is primarily ad hoc activity" (Suchman, 1987; p. ix). If action is irremediably situated, plans cannot causally determine actions and cannot be separated from them.

> "As projective and retrospective accounts of action, plans are themselves located in the larger context of some ongoing practical activity" (Suchman, 1987; p. 49).

Plans are necessarily vague because they cannot represent all the changing circumstances of their use. Moreover people usually "do not anticipate alternative courses of actions until some action is already under way". This implies that "the

efficiency of plans as representations comes precisely from the fact that they do not represent those practices and circumstances in all their concrete details" (Suchman, 1987; p. 52). Plans represent situated actions "at the level of abstraction at which it make sense to forego abstract representation, and rely on the availability of a particular, embodied response" (Suchman, 1987; p. 188). Plans therefore are representations of situated actions that emerge when situated actions become problematic and their significance is worked out in the particular and situated circumstances of their use. In that sense plans are indexical—that is, their meaning can be specified only in their actual use.

> "An instruction's significance with respect to action does not inhere in the instruction, but must be found by the instruction follower with reference to the situation of its use" (Suchman, 1987; p. 61).

It is the use of verbal and non-verbal resources that allows the users of plans to manage problems understanding them in the course of their interactions. In Suchman's opinion, in fact, the mutual intelligibility of actions is the outcome of in situ collaborative work that make use of unarticulated background experiences and circumstances and that is supported by communicative practice and face-to-face interactions that work as resources which can help manage problems with understanding. This analysis of human communication helps understand how asymmetrical human-machine communication is when compared with that of human agents given the limits that machines have in accessing the circumstances of their use and that this asymmetry needs to be addressed when designing interactive machines. So, it is necessary, for example, to understand that, given the plans' inherent vagueness, the objective of incorporating more and more accurate plans, based on a preconceived representation of the user into machine instructions to support human-machine interaction is bound to fail.

In summary, in Suchman's opinion the usefulness of plans resides in their abstracting uniformities across situations that makes it possible:

> "To bring past experience and projected outcomes to bear on present actions … and to orient or position us in a way that will allow us, through local interactions,

> to exploit some contingencies of our environment, and to avoid others" (Suchman, 1987; p. 186-188).

Suchman' s influential work has strongly affected the scientific community, and researchers with different disciplinary backgrounds such as cognitive science, human computer interaction (HCI), CSCW, artificial intelligence, and ethnomethodology, have commented on it. Vera and Simons (1993; p. 8), for example, state that situated actions are amenable to symbolic interpretation of the sort displayed by the cognitive science that elicited replies from Suchman (1993; 2007) and Clancey (1993). Within HCI studies, Kwong Bor Ng (2002) comments on the notions of plans and situated actions from a phenomenological perspective, while Ciborra (2002; p. 170) notes that cognitive studies assume that the actor deals with emerging circumstances as a passionless problem solver, which is not true, and that "the study of improvisation as situated action has not explained the temporal dimension of improvisation" in which, in his opinion, it is possible "to find in it all the ingredients of more routine, planned actions". Agre and Chapman (1990) suggest that Suchman's work contributes to distinguishing two views of the plans' use in AI, namely the plan-as-program view and the plan-as-communication view, while Nardi (1996b) compares situated action with activity theory and situated cognition. Streibel (1989) comments on the impact of Suchman's theory of situated action on the design of instructional systems, and Dourish (2001a) highlights the link between Suchman's work and the understanding of social action and the design of interactive systems. More recently the Journal of the Learning Sciences (12:2; 2003) has dedicated a section to commentaries on Suchman' s book "Plans and Situated Action" and to Suchman's response to them (2003). On that occasion, Welles (2003) analyzed the impact of the concept of 'situated action' in education; Carroll (2003) and Vera (2003) focused on the effect Suchman' s book had in HCI, and on the theoretical discussion on plans in cognitive science, while Schwartz and Martin (2003) pointed to connections between Suchman's work and educational research. To conclude, it is possible to say that, despite the controversial reaction to Suchman's work, its relevance lies, as Sharrock and Button (2003) clearly explain, in having reversed:

> "The strategy of attempting to understand the organization of action in terms of the notion of *plan* in favor of understanding the notion of *plan* in terms of the organization of action" (Sharrock and Button, 2003; pp. 260-261).

3.2 Plans and cooperative work

Suchman's work has had strong impact on research interested in understanding the use of plans for doing cooperative work, and the way organizational members adjust to plans to make sense of their work.

Schmidt, one of the most influential scholars in the CSCW community, has repeatedly analyzed the role of plans in the coordination of work activities (see Schmidt, 1994, 1999, 2011b) with the aim of turning the CSCW community's attention towards the ways in which plans stipulate the articulation of work. As regard Suchman's work (1987), he maintains that the study of 'situated actions', while remarkable, has led researchers to merely confirm Suchman's conclusions: that the use of plans is problematic in the course of work because plans are abstract idealizations of work that ignore the way work is accomplished, at the expense of the critical analysis of how plans are used to accomplish cooperative work. In addition he claims that, following Suchman, the presupposition that procedural formulations should be interpreted literally by workers because they are exhaustive descriptions of how the work has to be done, has informed an entire line of investigation on the differences between formal and informal procedures that, in turn, has confirmed the characterization of 'formal plans' as incomplete.

In his paper 'Frail Foundation', Schmidt (2011b) shows that Suchman incorrectly attributes certain features to plans. In particular, he focuses on 'plan incompleteness' and 'plan weakness'. As stated before, Suchman claims that plans are necessarily vague because they cannot take into consideration all the changing circumstances of our actions (Suchman, 1987; p. 52). But in Schmidt's opinion the problem with the presumed incompleteness of 'formal plans' is a false one. He, in fact, maintains that Suchman's attempt to criticize cognitivist theory has not been based on of a refusal of some of the

premises of the cognitivist position, even if unwittingly. Fox example, Suchman has failed to recognize that the completeness of plans cannot be defined in the abstract, but only within a specific practice. Only in this way, in fact, is it possible to say if a plan is complete or not, despite its formulation. The plan's completeness, in fact, can be defined by taking into consideration the possibility that users will be able to follow it unproblematically. A vague specification for the researcher is not necessarily a vague one for a competent practitioner.

The question of 'plan weakness' refers to Suchman's assertion that plans are constituents of our actions as artifacts of our reasoning about action, not as generative of action.

> "Just as it would seem absurd to claim that a map in some strong sense controlled the traveler' s movements through the world, it is wrong to imagine plans as controlling actions" (Suchman, 1987; p. 188)

Schmidt has criticized this comparison between the use of plans and maps for several reasons. First of all, it suggests a causal relationship between plans and actions, but really plans cannot causally determine anything. In addition, this comparison suggests that plans can only be orienteering devices while, as Schmidt has empirically observed (Schmidt, 1999), the role of plans is more differentiated than generally assumed. Plans, in fact, can be consulted as mere referents, but they can also be deliberately and carefully designed with the aim of constraining people's activities, reducing their local control over what is going on (Schmidt, 1999; p. 324). This is the case with check lists that:

> "Offer a limited selection of safe, secure, legal, valid, advisable, efficient or otherwise prescribed 'moves' while excluding 'moves' that generally would be considered unsafe" (Schmidt, 1999: p. 325).

So, differently from what Suchman suggests, plans can have both a 'weak' and a 'strong' role in the determination of practitioners' activities.

The other question that has been brought up by Suchman's work is the idea that the use of plans is necessarily connected with interpretative work, so plans are different from situated actions in that applying plans requires interpretative work. Schmidt, on the other hand, suggests eliminating the gap that Suchman has created between 'plans', which require

interpretative work, and 'situated actions', because in ordinary work practices workers engage in interpretative work only when a doubt arises as a practical issue. In Schmidt's opinion (2011b), Suchman, in accordance with a widespread rule-skepticism strongly rooted in social science, has interposed interpretation between plans and actions. So actors first interpret the situation, then compare the plan with that situation, and finally act. Schmidt instead suggests that even though rules cannot explain how they should be enacted locally because, as Wittgenstein notices, people need to make sense of what rules mean and to decide how to follow them in accordance with specific situations, at the same time actors "are not engaged in an endlessly interpretative work" (Schmidt, 2011b; p. 381). Actors, instead, interpret—paraphrazing Wittgenstein—"when they don't feel at home in the present picture" (Wittgenstein, 1945-1948; § 234; in: Schmidt, 2011b; p. 374). In summary, Schmidt claims that during ordinary work practice practitioners usually do not need to interpret endlessly but only when doubts arise, i.e. when uncertainties concerning the sense of a rule or its application arise, and the arising of doubts presupposes certainty. Doubts, then, are practical issues, since practitioners doubt when it is conceivable that there could be something wrong. So the application of plans does not require interpretation in the way described by Suchman, and any substantial differentiation between plans and situated actions can be made on this basis. Plans can be followed 'blindly' when their execution is a practice actors are trained for and blindness does not mean ignorance but certitude about what to do (Schmidt, 2011b; p. 375).

> "The concept of practice, then, should not be conceived of as a mere conduct or behavior, nor as incessant improvisation or 'irremediably contingent' action. A practice … provides the standard of correct or incorrect conduct" (Schmidt, 2011b; p. 376)

In addition, Schmidt claims that what characterizes plans is not the possibility of causally determining action, but their normative dimension (Schmidt 1999; 2011) that "provides criteria for what is correct and what is not, for what is right and what is wrong" (Schmidt, 2011b; p. 373)—that is, "for whether or not a particular action is correctly executed" (Schmidt, 2011b; p. 366).

Drawing on Activity Theory insights, Bardram (1997) shows that it is not necessary to impose any particular conceptual apparatus between plans and situated actions since planning is a situated action. Bardram takes as a starting point for his argument Suchman's (1987) definition of plans as resources for action rather than as devices that can determine its course in a strong sense. In Suchman's analysis, in fact, plans are representations of situated actions that can be used before the act or as *post hoc* reconstructions of it. Bardram (1997; p. 18) highlights that this interpretation of plans creates a 'planning paradox' in that plans cannot be generative mechanism of work but they can be used only to reflect on it before or after its execution, but this does not represent the actual use of plans in work settings. Plans, in fact, are not merely used to reflect on work in the sense that they can effectively support coordination and collaboration between several professionals as "valuable mechanisms for giving order to work". Bardram's analysis of daily clinical work, in fact, shows that in that setting, planning in advance on the basis of standard treatment for diseases makes it possible to anticipate ways to execute activities while plan implementation allows for the plan to be adjusted to the conditions of the concrete situation. The strength of the plan is therefore:

> "The anticipation of future ways of performing activities, detached from, but still taking into account the conditions of the real-world settings. When applying a plan to a concrete problem, the situated actions performed in the activity often mirror the plan, but are adjusted to the concrete details and conditions of the context" (Bardram, 1997; p. 24).

So, for example, using treatment protocols in clinical work can be shaped by patients' conditions in the sense that an examination foreseen by the protocol can be skipped or another added whenever necessary.

To summarize, it is possible to say that patients' care is organized on the basis of ongoing and socially constructed planning activity that is enhanced by and, at the same time, itself shapes work activities at the hospital. In this activity plans are used to pre-handle work activities because they represent the recurring nature of some events and the experience obtained in handling such events. Bardram, in fact, asserts that plans are the historical crystallization of the socially developed knowledge regarding a certain

activity. Moreover, plans are resources for the realization of activities because the plans' users gain experience of using them during the activity itself. This means that plans should be considered part of the activity itself and therefore that we should refer to planning as a situated activity. In addition Bardram notices that deviations from plans are not exceptions, but important parts of the activity and potential learning situations, and that the very same recognition of deviations from the plan depends on monitoring the progress of work according to the plan.

Within the CSCW community Bardram's conceptualization of planning as situated action has inspired the study of planning for managing emergencies. In this sense Schafer et al.'s (2008) study of planning as a collaborative community is exemplary. They show that emergencies cannot be successfully managed using only prescriptive plans designed with a top-down approach by government agencies, but that these plans need to be integrated with the plans created by local communities. The latter, in fact, are the outcome of distributed efforts and take into consideration several local and situated aspects, such as the distribution of expertise among locals, features of the area, the organization of the emergency services —for example, whether they employ volunteers—, local politics and social dynamics between community members. So since such elements have an impact on the way stakeholders succeed in coordinating their activities, they need to be addressed while CSCW systems are designed. For example, Schafer et al. (2008) state that informatics solutions should support community-level work by encouraging the maintenance and building of relationships. Tena et al. (2014), instead, note, that emergency planning is a continuous process because it needs to address changes occurring in the surroundings, thus posing long-term coordination problems.

Drawing on a mixed-method design, Bardram and Hansen (2010) investigated what happens when plans have to be changed during their execution to understand the reasons that lead to changes in plans, the types of consequences changes have and strategies adopted by participants to deal with these changes.

They collected empirical materials in a hospital, focusing on the activity of scheduling operations to coordinate several activities both within and outside the operating theatres, such as staff shifts and patients admission to the hospital. What they notice is that the successfulness of the planning activity depends on its being a continuous activity that adjusts to the conditions of specific situations which, as a consequence, makes it possible to face different types of disruptions, such as emergencies or illnesses among the staff. In their opinion, continuous planning is necessary when it is impossible to anticipate every contingency that might arise in carrying out a series of tasks. Consequently, the distinction between the planning phase and the execution phase fades as planning never ends, even though it might be carried out following different priorities over time. Bardram and Hansen, in fact, notice that when planning in advance, the operators plan on the basis of best-case scenarios to optimize the use of resources to ensure the availability of staff and equipment, while when planning during the plan execution they focus on coordinating the parties involved in the execution of the plan as unforeseen events occur. So, as they note, continuous planning needs to be supported, ensuring communication between the parties involved that need to be updated on the changes to the plan or to participate in the negotiation process necessary to decide how to modify the plan.

In Bardram and Hansen's opinion, the relevance of this study rests in its showing that "it is impossible, both in practice and in theory, to anticipate and provide for every contingency that might arise in carrying out series of tasks" (Bardram and Hansen, 2010; p. 336).

Munkvold et al. (2007; p. 21-28), on the other hand, studying nurses planning their care in a rheumatology department drawing on the hermeneutic approach, show that planning the coordination of nursing assistance can be carried out without using, reading or filling in representations of plans, thus undermining the idea that planning is assumed to take place through the use of plans. Their data, in fact, which focuses on nurses writing patient reports, shows that decisions made about how to take care of the patient are conceptualized as the outcome of integrating information coming from different

documents such as the surgery chart, the patient list and the medical chart, so that "the official nursing plan is hardly visible" but still recoverable from the way information is included and excluded from the report. In the opinion of Munkvold et al. (2007), planning should be understood as a distributed and negotiated activity that can be conceptualized as a trajectory, that is,

> "Constantly changed, altered, negotiated in response to changes in the surrounding nodes that constitute the heterogeneous material/technological and human network of interconnected, mutually dependent nodes of material arrangements, practices and different professionals" (Munkvold et al., 2007; p. 28).

As such planning "should be supported in a distributed manner and embedded in the many existing information systems" (Munkvold et al., 2007; p. 28). Drawing on the study of how to implement IT for nurse planning in an integrated care system, Ellingsen and Munkvold (2007; p. 10) come to a similar conclusion:

> "We suggest conceptualizing infrastructural arrangements as loosely coupled IT systems such as physician' s notes, paper forms, nursing plans, and oral accounts. The strategy for implementing new IT systems should then be to integrate them into the existing network, making sure to establish a robust connection between the existing nodes".

The study by Munkvold et al, is relevant because it suggests there is a need to understand that even if plans are not in use, this does not exclude that some planning process might be on course and need to be technologically supported.

Herrmann et al. (2002 but see also Herrmann et al. 2000; Herrmann 2009; Fischer and Herrmann, 2011; Herrmann and Nolte, 2014) on the other hand, drawing on Gidden's (1984) structuration theory, use models, plans, and structures to support organizational change. Through a semi-structured approach to modeling cooperative work, in fact, they show that modeling future work activities using plans or diagrams supports the 'organizational walkthrough'—that is, the evaluation of whether an intended organizational change will provide the expected effects. They show that models can be very useful artifacts for discussing and thinking about organizational change in organizations that cannot test options of desired future ways of accomplishing work. In

particular, they show that models are useful in this process as they support the manifestation of latent conflicts—thus giving organizational members the opportunity to discuss them; the clarification of roles and the distribution of tasks within the work process and the participation of all the stakeholders in the evaluation of the potential effects of the intended change. In their opinion these processes are supported by the use of software-based representations of models. By using software-based technology to represent models, in fact, it is possible to provide notations that are both standardized, to provide the basis for evaluating the intended change avoiding ambiguities, and flexible to progressively determine the aspects that should be represented. In brief, the work of Herrmann et al. (2002) shows that models might support organizational change when they are used as descriptive tools.

3.2.1 Plans and workflow technologies

Seminal CSCW studies, by Suchman (1983) and Bowers, Button and Sharrock (1995) focus on workflow technologies, which are instantiations of plans, to highlight the limits of these technologies. In Suchman's opinion workflow technologies fail because they embody the managerial paradigm that puts forward the need to separate planning and work execution and that understands the execution of work as the outcome of the execution of prescribed sequences of steps. Suchman shows that office work is not accomplished through the orderly execution of steps, but that it instead looks like it is executed following prescribed sequences of action thanks to the workers' working out practical contingencies when assembling records. Workflow technologies thus fail because they do not recognize that the smooth execution of work is the outcome of the work, and not the work itself.

> "Standard procedures are formulated in the interest of what things should come to, and not necessarily how they should arrive there. It is the assembly of orderly records out of the practical contingencies of actual cases that produce evidence of action in accordance with routine procedure" (Suchman, 1983; p. 326).

System designers therefore should recognize the judiciousness required to act according to procedures and design systems that facilitate such an endeavor.

Bowers, Button and Sharrock (1995), instead focus on the use of workflow systems when they are 'external' to work—that is, when they do not directly control the accomplishment of work. Their research shows that when workflow technology is introduced within an organization to comply with inter-organizational requirements such as making the organization's work accountable for other stakeholders, the actual execution of work is affected. In fact, even if workflow technologies do not directly guide the execution of work but make the work accountable through formal models different from the models that are used to accomplish work, tensions can arise and it may become necessary to make efforts to solve them. As a result, Bowers, Button and Sharrock suggest it is necessary to understand that when workflow systems work at the boundary of conflicting interests within the organization—, for example, between the interest of the informal organization of work to get the work done and that of managers to account for work—, they should be designed to minimize difficulties that their introduction within organizations might cause.

More recently, Dourish's (2001b) ethnomethodologically informed study of workflow technologies showed that these technologies can be used not only to prescribe actions, but also as 'organizational accounting devices'. Noticing that these technologies are assumed to be effective in the coordination of work, despite the fact that their pre-defined formal descriptions of working processes do not match the improvised accomplishment of work, he advanced the hypothesis that workflow technologies are so widespread because they are used not only as prescriptive technologies, but also as 'organizational accounting devices'. This happens when they render work activities "observable-and-reportable as being the activity they describe" (Dourish, 2001b; p. 55)—that is, when workflow technology helps explain work. This conceptualization of workflow technology makes it possible to think the design of workflow systems as aids for visualizing work. To summarize, Dourish (2001b) suggests it is necessary to conceptualize workflow technologies not only as pre-specifications of work but also as technology that visualizes the order of work.

3.2.2 The medium of plans

It is also worth mentioning Whittaker and Schwarz (1999), Bardram and Bossen (2005) and Bossen and Markussen's (2010) design-oriented CSCW studies because they are interested in understanding the impact of the medium of plans on solving coordination problems. Bossen and Markussen (2010), for example, drawing on ethnographic fieldwork, show that it is possible to design plans for drug administration to standardize local practices and to enable their flexible use by different communities of practices at the same time. Separating the therapy plan into columns, for example, serves to separate different drug categorization systems that competent users can use in different ways—for example to check patient's medical history or to check drug intake modes. Bossen and Markussen (2010; p. 632) label these artifacts with the term 'ordering devices' as they have "multiple forms within a stable format, which enable them to combine a high degree of standardization and flexibility, and to function across and within various communities of practices". Similarly, Bardram and Bossen (2005) carrying out fieldwork on collaborative work in a hospital, noticed that plans support coordination thanks to their materiality, which makes them more or less movable and more or less visible at first glance. In addition, plans, like other coordinative artifacts, structure the kind of information that needs to be inscribed on them, and are often used in different ways by different professionals. This is why all such elements need to be taken into consideration when designing systems to represent plans in health environments that are not simply confronted with coordination issues, but also with privacy and surveillance concerns.

Whittaker and Schwarz (1999), on the other hand, over the course of their ethnographic study of software development, noticed that the medium of schedules impacts on long-term coordination problems, in terms of participants' commitment and responsibility. Comparing the use of a public board with electronic scheduling, they noticed that the processes of coordination are completely different in these two groups in the sense that cognitive and social factors "conspire to undermine the accuracy and credibility of the schedule, leading to coordinative failure" (Whittaker and Schwarz, 1999; p. 198). In particular, they notice that a large wallboard located in a public area is both more

accurate and up to date in that the wallboard schedule, by favoring the group interacting around the board, "enables collaborative problem solving, informing the colleagues about the local progress of the project, provides the overview of the relevant information and affords reminding personal commitments". Thus in their opinion, software to support group coordination should combine the benefits of the properties of paper-based tools with the affordances provided by electronic tools (Whittaker and Schwarz, 1999; p. 200).

3.3 Ethnomethodologically oriented studies of plans

To paraphrase Koskinen (2000; par. 8.2-8.3), it is possible to say that ethnomethodologically oriented studies of the use of plans within organizations have the merit of having demonstrated that "plans have uses and functions that are not deducible from rationalistic principles" and having pursued "radically descriptive ways of analyzing action through the detailed description of workplace interactions".

Drawing on EM, which fosters the postmodern conceptualization of organizations as arenas of organizational order, Dant and Francis (1998; par. 7.4) suggest it is necessary to study the use of plans within organizations by refraining from applying any model or theory. In their opinion, in fact, two social science theories, the rationalist and the pragmatist conceptions, which respectively conceptualize knowledge as separate from action and action as grounded in the contingent incompleteness of knowledge, have led from the study of plans as the outcome of rational activity —formal plans— to their study as contingent processes — informal plans— to the detriment of the recognition of the way formal and informal plans are intertwined in organizational settings. This does not mean that they do not recognize that organizations are inhabited by both formal plans—that is, by plans designed by authorities following a 'rational model' that identifies the actions to implement— and informal plans—that is, plans that are "members' formulations produced in response to questions concerning the in-situ logic of day-by-day decision making" (par. 4.2), but that this classification of plans obscures

the recognition that both these forms of planning are copresent within organizations, that both play a key role in accomplish organizational work, and that they are mutually implicative. In other words, adopting theoretical models to study plans impedes recognition of the multifarious functions that plans might have in the organization of work, while studying plans while abandoning simple theoretical dichotomies enables the realization that plans can be used in articulated and varied ways. So, for example, it is possible to understand that formal plans are not necessarily used by participants to provide rational solutions to practical problems, but as accounting devices.

> "An organizational rhetoric which serves primarily as a resource for those who have to produce plans as accountable, public documents; it provides a means by which the strategy making work of the organization can be represented as rational" (Dant and Francis, 1998; par. 7.4).

Koskinen (2000; par. 1.1), instead, drawing on CA, analyses conversation data in order to understand managers' use of plans to ensure order at the workplace. Studying managerial meetings he notices that plans are not merely used to give direction to work but also to support sense-making work. Managers, in fact, use plans to "systematize their vision of the workplace" and to "formulate the workplaces' activities as sanctionable". Plans, in fact, are used as a 'perceptual background' against which to identify troublesome elements or situations, to account for actions giving them a sense and coherence and to evaluate workers' results in relation with the outcomes of plans.

3.3.1 Studying software development projects

Within EM-informed studies, there is recognizable stream of research that studies the use of plans in cooperative work by focusing on the development of projects for software design. The development of software, in fact, is a perspicuous setting for studying how several interdependent tasks are coordinated across time and space on the basis of project plans.

Drawing on the assumption that coordination can be addressed through EM's understanding of actions as accountable by nature, Button and Sharrock (1998; p. 73) analyze how engineers manage the implementation of a project for software development. In their opinion coordination can be understood by studying how members

make their actions reciprocally accountable—that is, recognizable by the parties involved. Indeed, when work activity is collaboratively organized, people need to make what they do intelligible to all involved parties. Based on this premise, Button and Sharrock (1996) noted that engineers are inclined to make their work accountable as a consequence of the division of labor imposed by the organizational environment, but also as a consequence of the formats and time schedules imposed by project organization. The organizational context, in fact, defines "what is practicable" (Button and Sharrock, 1996; p. 97), thus determining the way engineers solve project implementation problems. So, for example, engineers do not direct their work towards searching for the perfect technical solution to the problem at hand, but instead look for the good-enough one—that is, the one that meets organizational terms and budget. This study is worth considering because, even though it does not directly address the question of how plans have an impact on the execution of work, it shows that the orderliness of work depends on the efforts that are made to understand current work with respect to the organizational problem-solving process, and that these efforts are possible thanks to the reflexive relationship between schedules, which directs work activities, and the way in which these activities are carried out, in order to meet fixed deadlines.

> "The fact that engineering work is organized as a project work, does not, in itself, ensure an orderliness to that work. The project does not assume the status of an organizing framework that can be unproblematically and successfully implemented" (Button and Sharrock, 1996; p. 373).

In that sense they show they are inclined to follow the 'irremediable incompleteness of instructions' highlighted by Garfinkel (1967)—that is, the way in which he demonstrated that implementing instructions is a problem of determining their meaning locally.

Rönkkö et al. (2005; p. 433), on the other hand, investigated what happens when plans do not work out in software development projects. To this end, they take as starting point Gerson and Star's (1986) concept of 'due process' that argues for the need to study the articulated structure used by workers to fill the gap between organization requirements and contingencies that might arise while getting the work done. Hence, by focusing on the articulation and coordination process around planning documentation, they try to

understand how inconsistencies that might arise while accomplish work—and that formal description cannot fully anticipate and provide for—are resolved. Thus, focusing on the articulation work around planning documentation, they notice that re-planning is an interactive process which, involving different stakeholders, draws on communication arrangements such as team meetings, discussions, and the documentation of plans. Plans, in fact, "provide the organization with an articulated structure that helps coordinate (distributed) development work" (Rönkkö et al., 2005; p. 441). Indeed, plan documents provide different levels of reference that constitute a framework against which it is possible to review project development, to identify deviations between the plan and its actual realization, and to understand which further negotiations are necessary to establish a new base for cooperation and coordination. It is worth noticing that, even if plans rarely provide enough information to support articulation work in software design, they never cease to be used to make work activities accountable during project realization, to meet the company' s requirements, and to prevent work from being interrupted. In the opinion of Rönkkö et al. this happens because software design is a planful activity—not in a cognitive sense, but in the sense that planning documents are used to coordinate complex and distributed activities as documents, that is, as a means to produce practical solutions to organization problems. In this case plans are not problematic tools but instead means of geting the work done.

To use Randall and Rouncefield' s (2011; p. 89) words, it is possible to say that EM-oriented studies on planning, emphasizing "[the importance] of studying how and in what ways plans are interwoven into highly variegated sets of (organizational) phenomena", enables the understanding of how several key work activities such as understanding workers' sense-making practices, understanding how decisions about future action are achieved, as well as understanding how plans and planning support the sequential organization of work, the determination of interdependencies among work activities and the ways work is made accountable.

This is possible in the sense that these studies are committed to empirical analysis of planning as 'an observable and accountable matter'—that is, to studying:

> "The way in which members typically deal with the fact that they are confronted with documents, strategies, visible managerial intentions, charts, policy statements, instructions, blueprints, diagrams, decisions, tollgates and so on" (Randall and Rouncefield, 2011; p. 75).

But, above all, because EM-oriented studies of planning, by refusing to study planning by drawing on theory-driven conceptualizations of plans, are in a position to reveal whether our understanding of plans draws on unwarranted conceptualizations.

To conclude, it is worth noting that the studies described above have mainly focused on understanding how people at work use plans that they cannot change but simply apply. In doing so they suggest an understanding of the use of plans that might be biased in the sense that they do not show, for example, how planners deal with instructions for setting up and changing the plan. As introduced earlier, this research aims to address this topic to enhance knowledge of how organizational actors work around and with plans to make sense of their work in contextually specific ways.

3.4 Artifacts and work coordination in flight and airport management

Several studies have investigated how managing airport activities and flight execution are coordinated, since these activities are highly distributed in space and need to be coordinated in time following the 'flight trajectory' (Strauss et al., 1997), that is, all the work related to the execution of flight. The Lancaster group's studies on flight management, for example, have (others include Hughes, Randall and Shapiro, 1992; Bentley et al., 1992; Hughes et al., 1994) had a strong impact on the CSCW community because of their focus on how to link the ethnographic study of the setting with the development of software design, and also for having launched research on the utilization of flight strips for managing air traffic control (see Harper and Hughes, 1993). This research has, in fact, been followed by other studies that have highlighted different aspects of flight strip use, such as their being memory aids (MacKay et al., 1998), and their supporting peripheral awareness among colleagues in the room (MacKay, 1999). They have also investigated the coordinative functions of flight strips in understand

whether it is possible to replace the paper versions of flight strips with software (Harper, Hughes and Shapiro, 1990; Berndtsson and Normark, 1999a; Berndtsson and Normark, 1999b; Fields, Amaldi and Tassi, 2005; MacKay et al., 1998; MacKay, 1999).

Other research projects (Halverson, 1994; Berndtsson and Normark, 1999a; Halverson and Ackerman, 2003; Fields, Amaldi and Tassi, 2005), on the other hand, have focused on boundary objects (Bowker and Star, 1999)—that is, the material artifacts that mediate the relationships between cooperating communities characterized by different aims and work practices (what Lave and Wenger (1991) call of 'community of practice'), in use between air traffic control and the flight control tower, and between the airport control tower and other ground services. Halverson (1994) and Halverson and Ackerman (2003) show that artifacts work as intermediary objects when they recontextualize expert knowledge across organizational boundaries and work as memory aids by crystallizing previous solutions into routine problems. Similarly, Berndtsson and Normark (1999a) analyze the coordinative function of a closed-circuit television system that transmits the view of the flight strip rack between adjacent sectors, such as the apron tower and the air traffic control center. They noted that this system worked as an 'awareness mediator' that supported coordination between services, reducing the need to draw on other forms of communication, such as telephone calls.

In addition there are studies that focused on the activities necessary to the execution of flights that occur on the ground (Goodwin and Goodwin, 1998; Suchman, 1996; Suchman, 1998). Goodwin and Goodwin (1998) demonstrated that to see a plane in a manner that is relevant to the task at hand (i.e. to load baggage) it must be situated within organizational networks, and that is possible only by drawing on a heterogeneous collection of technological artifacts and a social organization that enables the transformation of individual expertise into an element of the working culture of the operation room.

Suchman (1996) instead studies the activities of the operators in an operation control room who have to participate in ground traffic control. She notices that operators coordinate pilots and operators on the ramp using 'embodied articulation', in the sense

that they achieve the orderly movement of planes by crafting messages, and timing their transmission according to the identity of their interlocutors. Suchman (1998) also shows how the interplay between the structure of the workplace, the assigned location of operators within the room, and their interactions allow for the continuous transformation of restricted and public areas, thus supporting both joint activities and the different attention structure among operators.

Suchman (2011) and Harper and Hughes' (1993) studies are of interest here because they confront the problem of how prescriptive devices, i.e. schedules, are enacted. Suchman asserts that the orderly execution of flights is possible thanks to the operators managing the inevitable contingencies that come up while organizing flights and that managing these contingencies is possible thanks to the operators' continuously focusing on the flight schedule. She notes that schedules are both resources for actors organizing their activities and regimes created elsewhere to which participants are accountable for their activities (Suchman, 2011; p. 28). In that sense the smooth execution of flights is the outcome of the reflexive relationship between the prescribed order of events provided by schedules and efforts made to enact them.

Harper and Hughes (1993; p.130), on the other hand, stress the fact that schedules are enacted "in and through the making of the traffic flow" thanks to the conjoined use of several artifacts. In fact, the flight strips, the radar and the radio connection with pilots, together with the controllers' practical reasoning, allow them to "solve the sequencing problem as a matter of moment-to-moment problem solving", more than as a matter of following procedurally defined rules (Harper and Hughes (1993; p. 142). They notice that the use of all this equipment is mutually explicative in the sense that the meaning of the information provided by one artifact is gathered from what the other artifacts indicate in a reflexive way. This means that flight execution does not merely depend on unreflective application of rules, but instead is the outcome of the skillful use of procedures that, in turn, would be impossible without the information provided by the technology used.

> "The rules, along with technically provided information 'to hand', are resources reflexively deployed such that 'competent use' is founded on the controller's practiced grasp of what particular actions are necessary on a given occasion to provide adequate aircraft separation according to the rules and procedures" (Harper and Hughes, 1993; p. 129).

3.5 Strategic planning

Even though this research is not concerned with studying planning at the managerial level, it is worth remembering that understanding how plans and planning support the functioning of an organization has had a strong impact on managerial and organization studies. As Steiner (2010) suggests, the term 'strategic planning' encompasses the formalized approaches at managers' disposal for understanding what the business should be like and for formulating strategies towards achieving the desired goals. The interest in understanding how strategic planning affects the managerial capability to determine future courses of actions within organizations originated in the 1950s. As Grant (2003) explains, this interest has given rise to research on the capability of strategic planning to affect firm performance and the organizational process of strategy formulation even though, as Mintzberg and Lampes (1999) explain, different theoretical approaches in organization studies have since studied different aspects of strategic planning, to the point that it is not clear whether this research is showing "different aspects of the same process or completely different processes". Until the 1980s, in fact, strategic planning was conceptualized in 'prescriptive terms'. Strategic planning was therefore understood as a top-down process and managers were considered capable of producing "the best strategies as well as step-by-step instructions for carrying them out" (Mintzberg, 1994; p.107) for doers. This conceptualization of planning, which separates the 'thinkers', i.e. management, from the 'doers', also gave rise to studies focused on understanding the steps and techniques that make it possible to setup strategies. However, in the 1980s, in parallel with the emergence of the biases in cognitive understanding of plans that had such an effect on the previous conceptualization of strategic planning, the strategic process began to be studied in order to understand what that process was. In Mintzberg and Lampes' (1999) words, these studies introduced the 'descriptive approach' to

strategic planning, which to date is the mainstream approach for studying strategic planning. In Mintzberg and Lampes' s opinion the descriptive approach has provided new conceptualizations of the strategic process that, in turn, has been described as emergent, distributed within the organization's stakeholders, as a process of negotiation, as a culturally oriented process, and as a reactive process in the face of environmental changes. Some outcomes of this new approach to the study of strategic planning are, for example, studies on the use of plans within organizational teams to understand the impact of planning on team performance (Weingart and Weldon, 1991; Weingart, 1992; Marks et al., 2001; Mathieu and Schulze, 2006; DeChurch and Haas, 2008). This research has the merit of having suggested the study of planning at any organizational level, not only the managerial level. The descriptive approach has also put forward new ways of understanding the process of strategizing. In recent years, in fact, strategizing has been conceptualized as a practice (Whittington, 2006)—that is, as a dynamic accomplishment. This research studies all the activities that are "consequential for the strategic outcomes, directions, survival and competitive advantage of the firm, even where these consequences are not part of an intended and formally articulated strategy". As such strategizing is understood as "something that actors do as opposed to something that organizations have" (Jarzabkowski, Balogun and Seidl, 2007; p. 5) and it is studied by examining in detail the actions performed by the organization's participants when strategizing to unveil the details of strategizing's practical accomplishment (see Golsorkhi et al., 2010). This has made it possible to study strategizing from an EM perspective, as Samra-Fredericks (2003, 2004) studies of the discursive aspects of strategizing show, but on the whole the study of strategizing is of little use for this project that is not interested in understanding organizational life as ordered by strategies, but in uncovering the methods by which planning projects are brought to fruition within organizational settings.

3.6 Planning talk

Even though it is widely recognized that narratives make it possible to speak about past, present and future events, and that they help keep different temporal dimensions together (see Ochs and Capps, 2001, Shenhav, 2005 and Fasulo and Zucchermaglio, 2008, among others), few research projects have addressed the study of talk-in-interaction during planning. The most significant and systematic attempt to understand talk in the course of planning work is that by Stevanovic (Stevanovic, 2011; Stevanovic 2012a, 2012b, 2013, 2015; Stevanovic and Peräkylä, 2012; Stevanovic and Peräkylä, 2014). She (Stevanovic, 2015; p. 84) defines joint planning as "consisting of people making proposals for future actions and events, and others accepting or rejecting these proposals". Drawing on CA, and inspired by Heritage's studies on epistemics (Heritage, 2012a, 2012b, 2013a, 2013b but see also Heritage and Raymond, 2005) she studies meetings between professional cantors and pastors who have to decide how to arrange joint future work. During her research Stevanovic notices that speakers are constantly focused on the social distribution of the rights to make decisions about the course of future joint actions. She detects the speakers' focus in "the subtle details of the turn-by-turn sequential unfolding on interactions" (Stevanovic and Peräkylä, 2012; p. 298) as she conceptualizes action formation within talk as systematically informed, not only by the contextual features like participants' social roles or hierarchical positions, but also by participants' mutual categorization as it emerges from the structural aspects of talk; what Enfield calls 'contingent categorizations' (Enfield, 2011). Therefore it is possible to say that since Stevanovic's work focuses on the reflexive relation between structural and categorical aspects of talk, it is analogous to Hester and Eglin (1997) and Watson's (1997) studies on how culture is constituted in action.

In Stevanovic and Peräkylä' s (2012) opinion the right to make decisions about future actions can be conceptualized in terms of 'deontic authority. The term 'authority' refers to "the exercise of power that the subject of authority understands as legitimate" (Stevanovic and Peräkylä, 2012; pp. 297-298). Thus authority is "based on the subjects' free will to obey". The term 'deontic' on the other hand refers to the authority of

"determining how the world ought to be". In that sense deontic authority is different from epistemic authority which "is about knowing how the world is". Both epistemic and deontic authority vary from domain to domain, and speakers might engage in negotiating who has the right to know or to do what has to be done. Stevanovic (2013; pp. 19-20) asserts that authority is typically claimed using 'directive-commissive' speech acts such as requests, proposals, invitations and promises, and using modal verbs or imperatives even though she recognizes that participants' use of modal verbs or imperatives is not enough to make an utterance an instance of deontic authority, because authority is locally worked out. In addition, she notes that studying participants' inclination towards deontic authority requires shifting the focus of attention from who claims authority to who accepts it.

> "It is not the initiating actions of potentially authoritative participants that tell us about the participants' orientation to deontic authority, but it is the way in which their co-participants respond to those actions" (Stevanovic, 2013; p. 20).

Stevanovic and Peräkylä (2012; p. 299) also identify two kinds of perspicuous settings (Garfinkel and Wieder, 1992) that make the negotiation of deontic authority evident: people managing "the moral responsibility for their past actions, namely people discussing what should have been done", and people's talking about their joint future actions, namely what "will be done".

Stevanovic (2012a; p. 2) explains that joint decisions depend on using proposals as they suggest the realization of certain courses of action but also that their realization depends on the recipient's approval. Stevanovic and Peräkylä (2012; p.299), on the other hand, show that during dyadic planning speakers are not only focused on the deontic rights they have and on the distribution of deontic rights that utterances suggest, but that speakers can also acquiesce or resist others' ways of distributing deontic rights between participants. Stevanovic and Peräkylä (2012; p. 299-306) also reveal the role of assertions and proposals in the decision-making process. In particular they claim that while proposals clearly express the proposer's intentions as "not binding but contingent on the recipient's approval", assertions are more ambiguous in that they can be heard as

informing but also being answered in a deontic way—that is, with the proposée's display of commitment through a compliance token.

Similarly to Heritage (2012a, 2012b), Stevanovic (2011; pp. 3-4) makes a distinction between deontic status and deontic stance. Deontic stance "refers to the relative strength of deontic rights claimed by the choice of the form of the utterance" thus, for example, interrogative formats convey a more mitigated stance of deontic rights than imperative formats. The deontic status, instead, is "the deontic rights that a certain person *has* irrespective of whether she momentarily *claims* these rights or not" and that might "vary from domain to domain". The deontic status thus depends both on the participants' social roles and also on:

> "The contextual embedding of interaction, the participants' overall activity framework, and the situational commitments arising through the sequential unfolding of interaction through which *certain deontic domains are invoked"* (Stevanovic, 2011, p. 5)

In the sense that participants are seen to take all these elements into consideration when assessing deontic rights relative to one another. Deontic status and deontic stance, as well as epistemic status and stance, are mostly congruent with each other even though this is not always the case. Stevanovic (2012a) also shows that making a joint decision about future actions heavily depends on speakers' consulting documents because this is essential for them to understand the subject matter of proposals.

To sum up, Stevanovic's work, by focusing on speakers' methods for making their actions recognizable as assertions or proposals, can be described as addressing the question of 'action formation', which is one of the present mainstream developments of CA research. Moreover it is the most significant attempt to study planning as talk-in-interaction and to understand how joint planning is achieved. That said, it is worth noting that her work, by investigating speakers' methods for resisting or complying with the deontic authority entailed in proposals and assertions, shows how planners agree *on who* has the right to determine future actions, more than on how the parties reach an agreement *on the content* of the plan. For this reason, Stevanovic's work is motivating

but provides little help with understanding how the RCT operators come to an agreement when deciding the information content of plans for the allocation of stands and gates.

3.7 Looking for a definition of the terms 'plan' and 'planning'

As briefly mentioned above, empirical research on plans has so far touched different aspects of the nature and use of plans, such as understanding the relationship between plans and actions, and understanding how organizational members focus on plans to make sense of their work in contextually specific ways, providing different definitions of the term 'plan'. As explained previously, the term 'plan' has been used by cognitivists to refer to 'instructions for action'; as if actions were "mere decompositions of plans" (Carroll, 2003; p. 274) while Suchman has specified that her understanding of plans concerns both plans as constructs developed in cognitive science —"prescriptions or instructions for action"— (Suchman, 1987; p. 36) and as "we might use them in ordinary affairs" (Suchman, 2003; p. 300). Schmidt (1999) focuses on 'plans' as 'formal organizational constructs' (FC)—that is, production schedules, office procedures, classification schemes and checklists while Bardram (1997) highlights the role of plans in anticipating future ways of performing activities.

> "The strength of the plan is the anticipation of future ways of performing activities, detached from, but still taking into account, the conditions of the real-world settings" (Bardram, 1997; p. 24).

Randall and Rouncefield (2011; p. 74), instead, maintain that attempting to attribute technical meaning to the terms 'plan' and 'planning' has only led to conceptual confusion and to empirical laziness. This is why they suggest accepting a more mundane definition of the terms 'plan' and 'planning' that comprises all the artifacts and activities commonly encompassed by these terms.

This research project is based on an understanding of the terms 'plan' and 'planning' as family-resemblance concepts (Wittgenstein, PI 1958; 66) that includes all the resembling terms used to describe tools and processes that aim to anticipate future ways of performing activities.

4. Research design

Qualitative research, which is a process that involves both data collection and analysis, studies phenomena as they occur in natural settings drawing on several research methods. As such, "it requires highly contextualized individual judgments" (van Maanen, 1998, p. xi) with regard to the type of data to analyze, and how to collect them. This is why presenting the research methods and analytical framework adopted to conduct the research is necessary. This chapter fulfills this requirement by presenting the researcher's paradigm, an overview of the conceptualizations of ethnography and of membership categorization analysis (MCA)—as they are the methods by which empirical materials were collected and analyzed—, and the trustworthiness criteria of research. The chapter also demonstrates the validity and ethics of this research by explaining how data were collected; the criteria adopted for selecting primary data on which to base the analysis and the analytic process they went through.

4.1 The lack of an inquiry paradigm

Guba and Lincoln (1994) assert that all researchers draw on inquiry paradigms—that is, a set of basic beliefs that define the researchers' onto-epistemological position when carrying out research. This means that researchers carry out research drawing on assumptions about the nature of the world, about the type of the relationship between the knower and what can be known, and about how what they believe can be known can be accessed. Guba and Lincoln (1994) identify four main inquiry paradigms—positivism, postpositivism, critical theory and constructivisms— and suggest researchers need to explain their theoretical view to clarify what their research permits the reader to comprehend, and whether their methodological choices are consistent with their assumptions. This line of reasoning, though widely shared, is refuted by

ethnomethodologists who assert that any pre-defined ontological stance on the nature of reality is necessary to identify how orderly actions are accomplished.

> "[Ethnomethodology] consists, purely and simply, in a set of analytic choices. This point, deceptively simple, proves extraordinarily hard to grasp for researchers within the social sciences, let alone elsewhere. These choices in turn are not founded on philosophical beliefs about how the world must 'really' be but a concern for the ordinary, practical commonsense reasoning procedures which make up people's understandings of social life, the resources they use to make sense of aspects of the social world" (Randall et al., 2007; p.120).

Ethnomethodologists consider recourse to theories distraction from members' methods, and useless because, since members of society do not act on the basis of theories, there is no necessity to draw on theorizations of social phenomena to understand them. This is why EM's refusal of theory is essential to its program. To use Sharrock's (1995) words, it is possible to say that EM aspires to realism:

> "'Realism' - not realism, in the metaphysical sense, of asserting the existence of an external reality, but 'realism' in the phenomenological sense of faithfulness to the portrayal of its subject matter, a devotion to capturing society as it is actually experienced 'from within'" (Sharrock, 1995 in Randall et al., 2007; p. 122).

Moreover ethnomethodologists resist the misleading presentation of EM as consistent with the tenets of social constructionism, as Randall et al. (2007) clearly explain. In their opinion,

> "[By reacting against the tendencies that] deny the existence of social reality, constructivists seek to dispute the 'commonsense' understandings that members of society have, often amounting to the suggestion that members of society do not know what they are doing. The task constructivism sets itself is, of course, to challenge members' understandings, to show how they are wrong and to present alternative, and authoritative, conceptions of both the way things are and how they got to be that way. These studies claim to show that what appears to people as commonsense or obvious - for example that death or disability is a physical and biological event - are nothing of the kind but instead interpretative constructions, that can, therefore, be constructed differently - so that death or disability becomes a 'social construction'"(Randall et al., 2007; p.122).

In that sense,

> "The constructivist view contrasts with ethnomethodology's commitment to 'indifference', that attempts neither to undermine nor to support the everyday realities to which the members subscribe but to investigate, describe and understand them" (Randall et al., 2007; p.122).

Moreover, in the opinion of Randall et al., constructivism's tendency to conceptualize social reality as the outcome of individual interpretation has produced:

> "A shift away from a careful concern with the research setting and its members to a focus on the researcher and the research act itself - and the subsequent endless 'navel gazing', 'confessional tales' and dreadful attempts at poetry and other forms of narrative reconstruction" (Randall et al., 2007; p.122).

Coherent with its ethnomethodological orientation, this research has been carried out without the researcher taking any ontological stance on the nature of reality but drawing on the analytic choices that characterize the EM approach summarized in paragraph 2.1.

4.2 Selecting the methodological tools for research

Following Hester and Francis (2000; p. 409), who claim the need to construct sociological inquiry from within "in the sense that the means by which inquiry is built are ones which the phenomenon itself makes available", this research has been carried out drawing on EM, ethnography and MCA as the proper means of accessing planning work as accounting work—that is, looking at "how various types of social activity are brought to adequate descriptions" in the sense that "what counts as social reality itself, is managed, maintained and acted upon through the medium of ordinary descriptions" (Heritage, 1984; pp.136-137).

EM is used because it sensitizes to the study of work in its actual accomplishment; ethnography is used to understand the setting as the participants in the research do, to access participants' background knowledge, and to study how participants produce contexts for their interactions locally. MCA, finally, is used as a privileged way to access how planners' knowledge is deployed in the descriptions of people and objects.

4.3 Ethnography in brief

The term 'ethnography' is usually used to refer to a form of social inquiry that implies the researcher's direct observation of social phenomena. As Atkinson and Hammersley (1994; p. 248) suggest, ethnographic studies are recognizable because they share a set of common features, such as the tendency to work with unstructured data; the detailed investigation into a small number of cases, or even only one; and presenting the results of research in the form of explanations, not as statistical analysis. Ethnography is a qualitative research method that implies the researcher leaving her office (and sometimes her own life) for quite a long period of time to directly study the social phenomenon of interest, observing it in the field of its occurrence. Ethnography therefore is particularly suited for the study of social actions, more than beliefs. Ethnography, in fact, makes it possible to understand what practitioners do; their practical reasoning, and the meaning they attribute to objects in the course of their interactions.

The origins of modern ethnography are usually identified in reports of journeys and studies carried out by anthropologists in exotic settings where the study of not easily accessible social phenomena was possible. Malinowski's fieldwork in the Trobriand Islands (1922), in particular, is considered the most significant of these studies due to, as Atkinson and Hammersley (1994) point out, his concern for documenting the everyday social life of islanders. It was only with the birth of Chicago School between 1920 and 1930 that ethnography started being used by sociologists. Ethnographic studies, in fact, were considered useful for investigating urban settings and organizations, which were analyzed as if they were exotic societies. Chicago School scholars carried out their studies drawing on a wide range of data sources, combining direct observation of participants with life stories, interviews and document analysis (see: Whyte, 1943). Andersons' (1923) analysis of Hobos' life is one of the most well-known pieces of Chicago School research.

In Hammersley and Atkinson's (1983) opinion, over the course of its development, ethnography was affected by the different conceptions of science that occurred in the

course of its history. In the 1930s and 1940s, when positivism strongly influenced social scientists with its concern with testing theories by comparing them with facts collected by means of 'theory-neutral' methods, aimed at eliminating the effect of the observer, ethnographers developed an alternative view of the nature of social research: 'naturalism'. Naturalism proposed studying social facts in natural settings and the need for researchers to be devoted to the phenomena under scrutiny, instead of methodological principles. It was suggested to treat the culture of those studied as 'anthropologically strange' to be able to study it as something external to the researcher, as a natural phenomenon. But in the 1960s ethnographers began to be aware of the limits of naturalisms. They recognized that it was not possible to consider their descriptions as objective in that researchers are inevitably part of the social worlds they study: researchers "have no external, absolutely conclusive standard by which to judge" and the methods they use are anything but "refinements or developments of those used in everyday life" (Hammersley and Atkinson, 1983; p. 15). This awareness had several implications for the practice of ethnography. For example, researchers stopped trying to eliminate the effects the researcher has on the field under scrutiny, and started considering researchers active participants in the research process. As a consequence they also started collecting data about their own research process. In fact, the possibility for researchers to shape the context of research become a central topic in data analysis. The concept of science highlighting the fact that researchers "are part of the social world [they] study" in the sense that "there is no escape from reliance on common-sense knowledge and on common-sense methods of investigation", and that recognizes that "all social research is founded on the human capacity for participant observation", on the capacity to "act in the social world and … to reflect upon … actions as objects in that world" (Hammersley and Atkinson, 1983; p. 25) is called 'reflexivity'. Moreover, researchers started recognizing themselves not as cultural descriptors, but as developers and testers of social theories. Theories started being tested by examining cases that are crucial for a theory, and developed inductively by systematically comparing data, since "over time the ethnographer has the opportunity to check out his or her understanding of the phenomena under study" (Hammersley and Atkinson, 1983; p. 24). The flexibility of

ethnography—that is, the possibility to change the direction of research quite easily in light of the development of the theory—has played a key role in the theory-building process. Moreover, ethnographers' use of multiple data sources has allowed them to systematically compare data obtained from different sources, thus reducing the risk that results are method-dependent[1].

4.4 Doing ethnography

Ethnographers collect data by participating in people's daily lives, they want to understand "watching what happens, listening to what is said and asking questions through informal and formal interviews and collecting artifacts" (Hammersley and Atkinson, 2007; p.3). Ethnographers, in fact, normally gather whatever data is available to understand the phenomenon they are interested in and base their analysis on a composite set of data collected by drawing on several data sources. Unlike experimental research, ethnography studies people's actions as they occur in everyday contexts instead of recreating them in controlled settings and does not collect data following a fixed research design, but starts investigating some aspects of participants' lives to progressively refine (or even change) the research questions, drawing on progressively focused data collection. Researchers, for example, might decide whom to interview in the course of the study. Carrying out data collection in natural settings usually requires that researchers negotiate access to the field or decide to carry out research covertly. When researchers decide to research overtly, they have to come to an agreement with the people who control access to the setting, the 'gatekeepers', about the conditions of their participating in the field, and they have to co-construct their identities with all the involved participants. When, on the other hand, researchers think that gatekeepers will block their research, they can decide to access the field without presenting themselves as researchers, instead, accessing the field by taking on a role in the community of interest,

[1] For the historical development of ethnography see also Denzin and Lincoln (2000).

for example by taking up a job there. Carrying out research overtly requires defining how the researcher will participate in the sense that the researcher might play different roles in the observed community. He may, in fact, participate in community life as a complete observer trying to become invisible and not interfering in participants' activities; as an observer-as-participant, by mainly observing the setting but also contributing to the activities carried out in the field; as a participant-as-observer, shifting hes role from observer to participant; or as a complete participant, while fully participating in the community life, for example as happens in 'action research' projects, or when the observation is carried out by a community member (Hesse-Biber and Leavy, 2006; pp. 245-251). Carrying out research covertly, on the other hand, makes it possible to bypass negotiations with gatekeepers, but requires that the researcher face anxiety connected with the risk of being discovered and ethical questions connected, for example, with the need to hide her real identity while creating a trusting relationship with members of the observed community.

Once they have accessed the field, researchers usually struggle to understand the domain under scrutiny by discussing with participants. Conversations with participants might have different formats that range from structured to unstructured interviews, depending on the strong or weak organization of the topics and of the structure of the interaction. It is therefore possible to speak of structured versus unstructured interviews. In unstructured interviews the order of the questions is not defined in advance, and questions are open-ended, while structured interviews draw on a pre-defined, structured formula in which the format of questions, their sequence, and the format of answers are more controlled. In addition, interviews can be conducted individually or they can be in-group interviews (Kvale, 1996). Interviews, as well as daily interactions, can be audio or video-recorded, even though recorders usually do not replace writing descriptive field notes. The field notes, in fact, by recording observational and interview data, are at the basis of the analytic process.

> "As we have emphasized, the formulation of precise problems, hypotheses, and an appropriate research strategy is an emergent feature of ethnography. This process of progressive focusing means that the collection of data must be guided

> by the developing clarification of topics for inquiry. The regular production of analytic memoranda will force the ethnographer to go through such a process of explication. Ideally, every period of observation should result in processed notes and the reflexive monitoring of the research process. As the memoranda accumulate, they will constitute preliminary analyses, providing the researcher with guidance through the corpus of data. If this is done there is no danger of being confronted at the end of the fieldwork with an undifferentiated collection of material, with only one's memory to guide analysis" (Hammersley and Atkinson, 2007; p.151).

Data analysis might draw on different theoretical and analytical perspectives (see Gubrium and Holstein, 1997) and can be carried out adopting different strategies. As Atkinson and Hammersley (2007; p. 158-159) clearly point out, "there is no formula or recipe for the analysis of ethnographic data". They recognize that ethnography often has a 'funnel structure' since researchers develop or even transform their research problems over time, but they also recognize that making sense of data might proceed in different ways. In early stages researchers can compare data coming from different sources and try to see whether patterns can be identified, and they can subsequently proceed with grounded theorizing or with studying the actors' actions. In Atkinson and Hammersley's (2007; p. 166) opinion, grounded theorizing, which emerged from Glaser and Strauss (Glaser and Strauss, 1967) work, should not be treated as a single orthodoxy, but as a stimulus "to move away from sterile reliance to pre-existing theory". Thus, grounded theorizing can be understood as the construction of categories and their progressive codification to the development of inductively constructed theories. The study of actors' actions, instead, entails a specific focus on actors' methods through which social actions are accomplished. In this case the ethnographers seek "to understand the meanings that are generated in, and that generate, social action" (Atkinson and Hammersley, 2007; p. 168) avoiding imposing their own meaning on data. The outcome of the data analysis, then, can be organized into taxonomies or typologies to describe the characteristics of the phenomena under scrutiny (Lofland et al., 2006). Very often, ethnographic studies end up at this level of the analytic process, but this does not exclude that ethnographies can be used to test theories. When this occurs, researchers usually try to find the limits of previously proposed generalizations on the function of local forms of social organization by postulating new conditions and moving back and forth between theory and data

(Silverman and Marvasti, 2008). This usually helps underline the need to further develop the theory under scrutiny. Weinberg' s (Weinberg, 1994) position on theory quoted in Silverman and Marvasti, 2008 (Silverman and Marvasti, 2008) helps understand how theorizing can be understood in qualitative research.

> "My own orientation to theory is rather broader than the one we often find in theory textbooks. For me, theory simply refers to the analytic relevance of your empirical work to more general questions being debated in your academic field or fields. Hence, I was interested in issues like power, social constructionism versus realism, macro/micro relationships, structure and agency, and material and ideological structure, and I thought a lot about how these issues were playing out in my own research settings and how what was going on in my settings might highlight things that many academic colleagues might find interesting or valuable with respect to these more general topics" (Weinberg, 1994 in Silverman and Marvasti, 2008; p. 52).

Ethnographic reports thus generally provide "well-substantiated conceptual insights that reveal how broad concepts and theories operate in particular cases" (Gephard, 2004; p. 455).

The methodological literature on how to carry out ethnographic study has so far expanded remarkably (see, among others, Atkinson et al., 2001; Denzin and Lincoln, 2000; Gobo, 2008) so that, as Atkinson (2005) asserts, ethnographic research runs the risk of becoming more and more fragmented and unhelpfully incoherent. Scholars have written several manuals to explain how to access the field and how to manage relationships with participants, gatekeepers and informants. Even while recognizing the usefilness of such manuals, it seems reasonable to consider the point of view of Randall et al. as well (2007; p. 193). They, state that ethnography is a procedure that does not require "immense amounts of training", even though it should not be confused with simple "hanging around". Fieldwork, in their opinion, may be successfully carried out by "showing an interest in what people do and what they have to say, and tolerate long periods of boredom". These scholars do not want to minimize the difficulties that researchers may encounter when accessing the field, but highlight that what makes each ethnography challenging is not managing the researcher's access and presence in the field, but analyzing the collected data.

4.5 Writing ethnographies

Writing the final report of the ethnography is a substantial part of the research process because writing is closely related to analysis (Atkinson and Hammersley, 2007). In Atkinson and Hammersley 's opinion (2007), ethnographic reports can be written following different genres, and may be recorded using different materials. Drawing on van Maanen's (1988) work, they identify four genres or varieties of ethnographic writing: the realistic or impersonal account; the confessional account that describes how the researcher carried out the study; the impressionist tale that implies the use of literary devices when evoking scenes and actions, and autoethnobiography (Atkinson and Hammersley, 2007; p. 204)—that is, ethnographies in which "the ethnographer is simultaneously the subject and the object of observation" so that the text is an exploration of the researcher's personal experience.

Atkinson and Hammersley (2007; p. 196) also state that, despite their genre, ethnographies are usually written interplaying "the concrete and the abstract, the local and the generic, the substantive and the theoretical". This means that ethnographic reports are characterized by recurrent dialogue between individual cases and ideal-typical constructs so that the former are used as exemplifications of the latter. In addition, ethnographies should be characterized by demonstrating the adequacy of their theoretical claims. Researchers have the responsibility not to persuade the reader by using rhetoric, but by putting him in a position to assess the adequacy of the analytic claims.

Atkinson and Hammersley (2007) recognize that reports of ethnographic studies might have variegated formats that span narrative mode and a mix of textual formats with ethno-dramas or poems. In addition, apart from 'standard' ethnographies written on paper, they suggest considering the use of technology to create hypertexts that integrate audio and visual materials with written text. This way, readers can have deep access to empirical materials in the course of reading.

4.6 Trustworthiness criteria for qualitative research

Guba and Lincoln (1989) claim that specific criteria for ensuring the quality of qualitative studies are necessary, since quantitative and qualitative research draw on different axioms. In particular, these scholars propose revising the criteria adopted for evaluating quantitative research and the strategies for meeting these criteria to address the peculiarity of qualitative research. Internal validity of qualitative research is therefore explained in terms of credibility; external validity in terms of transferability; objectivity in terms of confirmability and reliability in terms of dependability. Credibility refers both to the measures that the researcher adopts in order to increase the likelihood that credible findings are produced, and to increase the probability that these findings are recognized as credible. Transferability refers to the possibility of transferring the results from one particular study to other contexts; confirmability refers to minimizing the researcher's judgment on the formulation of the results of the study, while dependability refers to the researcher's making the inquiry process available for inspection. As introduced above, each of these criteria have precise corresponding strategies for their operationalization, as the table below summarizes.

Fig. 4.1: Operationalizing the criteria for the evaluation of qualitative research (from Guba and Lincoln, 1989)

Criteria for the evaluation of qualitative research	
Credibility	
* Increasing the likelihood of producing credible findings	*Prolonged engagement and persistent observation* Staying in the field long enough to observe different situations *Triangulation* Checking information collected from different sources or methods
* Establishing credibility	*Peer debriefing* Checking preliminary data analysis with other researchers *Negative case analysis* Searching for cases that do not fit with previous discoveries *Members' check* Checking preliminary data analysis with participants in the research
Transferability	*Thick description* Describing the context extensively
Dependability	*Inquiry audit* Attesting to the quality of the inquiry process
Confirmability	*Confirmability audit* Attesting to the fact that data can be tracked to their sources and that the logic underlying their interpretation has been explained

The prolonged observation refers to the researcher staying in the field long enough to observe different situations to get to know the setting in depth. Triangulation refers to the use of different methods for data collection to check factual data, more than to

searching inconsistencies across different sources. The peer debriefing consists of discussion with peers about findings to obtain insightful suggestions to further develop research. The members' check consists of discussing the preliminary data analysis with the participants while the negative case consists of comparing preliminary results with cases that do not fit with the identified recurrences. The thick description consists of providing several details, while the inquiry audit enables the inspection of the inquiry process's quality.

It is worth noting that transferability depends on the thick description of the context in the sense that a detailed description of the setting allows readers of the research report to find similarities with other situations. It is worth noting that, when deviations from the research plan occur, they need to be documented, since dependability consists of allowing the inspection of the research process.

4.7 Ethnography and the study of workplace settings

The ethnographic study of organizations has a long-standing tradition. Since the 1950s, researchers have provided detailed accounts of organizational life (see, among others, Crozier's (1964) study of French public administration, Roy's (1959) analysis of work in a garment factory, and Goffman's (1961) account of life in a mental health institute). Subsequently, in conjunction with the development of behavioralist theories, the ethnographic study of organization was abandoned until the 1980s when, thanks to the emergence of the interpretative turn (Geertz, 1973), which highlights the need to understand culture as a net of interpretations, ethnography was recognized as the means apt for entering the web of interpretations that people provide about what they do and ultimately to understand organizational life. Alongside this, a renewed interest in qualitative methods for the study of organizations emerged. Simultaneously, new ways of carrying out research in organizational settings emerged. Knoblauch (2005), for example has coined the term 'focused ethnography' to highlight the differences that exist

between anthropological ethnographies and those carried out in sociological research to study work.

> "The purpose of stressing the category of focused ethnography lies in the fact that the image of ethnography until today is shaped by the image of long-term field studies common in anthropology. Only long-term field studies, it seems, epitomise what may rightly be called ethnography. With this ideal derived from anthropology, many of the ethnographies done in sociology and other fields frequently appear to fall short or to be 'deficient'. As indicated, I would like to argue that … particularly within sociology there has developed a type of ethnography that differs from this classical type" (Knoblauch, 2005).

The term 'focused ethnography' thus refers to ethnographies that share the same features: they are characterized by the short duration of field visits, the intensive use of audio or visual recorders to support data collection and analysis, and the intensive scrutiny of data to study specific aspects of the field, mainly carried out to investigate laboratory practices and study work activities in high technology settings. In Knoblauch's opinion, examples of focused ethnographies can be found in CSCW research (Hughes et al., 1994) and in workplace studies (Luff et al., 2000). In these ethnographies the collection of audio and/or video recordings (and their detailed transcription) integrates the 'traditional' methodological set of strategies for data collection, ensuring it is possible to repeatedly inspect the collected empirical materials and make them accessible for collective data analysis sessions and for scholars' inspection. In this focused ethnography, which is interested in capturing participants' own perspectives (what is often expressed with the term 'emic description')[2], enables intersubjective data analysis "to a degree unbeknownst in ethnographies that exclusively draw on the researcher's collection of field notes". In summary, the term 'focused ethnography' addresses an innovative way of conducting ethnographic studies that has specific sociological implications because, while advancing the understanding of work through the study of its basic segments, it recognizes the details of the execution of work as the building blocks of the organizations' functioning on the whole, and it makes it

[2] Pike (1967; p. 37) created the terms "emic" and "etic" with the aim of differentiating descriptions of participants' behaviour. The "emic" viewpoint implies the study of behaviour from inside a particular system while the "etic" viewpoint comes from outside of the system.

possible to achieve an empirical understanding of the organization's functioning that was unimaginable before.

> "Critics may contend that the focus on the particular is part of a microscopic 'hyper-pointillism' which cuts sociology off from more encompassing societal concerns. The empirical orientation towards the details of social practice, however, must be seen as a form of acknowledgement of the importance and relevance of the multitude of this social practice ... In fact, focused ethnographies are studies of highly differentiated divisions of labour and a highly fragmented culture. The more diverse and short-term the fields and activities to be observed become, the more flexible, short-term and focused should be the instruments of our research. Inasmuch events, people-processing or key-situations are the basic segments of social life, organisations and whole societies, and inasmuch as social relations, social networks, even whole social milieus depend on events, encounters and situations, the study of these building blocks of society and their order within that society becomes a quite obvious task for sociology. In studying modern society in its details, ethnographies do not only demonstrate their peculiarity; they also address the ways in which these particular fields are related to other aspects in society. This way, these ethnographies may contribute to a view of modern society that is much better 'grounded' than most of the grand theories" (Knoblauch, 2005).

In general terms then, it is possible to say that in Knoblauch's (2005) opinion present ethnographies of work settings are interested in understanding the ordinary and hidden dimension of work activities and the actor-context relations.

Similarly, ten Have (2004) has coined the term 'institutional ethnography' to indicate the researcher's entering an organization, or the service of an institution, to study particular aspects of daily working activities. As happens in anthropological ethnographies, the institutional ethnography comprises three phases:

- gaining permission to access the field. This implies submitting a research proposal to the management of the institutional context and the negotiation of the researcher's presence in the field;
- the researcher's presence in the field, which could be in the form of participant or direct observation, collecting interviews, and drafting the field-note;
- analyzing the collected empirical materials and producing a report both for the field and for academy;

But, differently from 'ordinary' ethnographies, institutional ethnography pays specific attention to the practical and ethical questions that arise when using recorders and when

the participants' permission to be recorded needs to be obtained.

'Organizational ethnography' is the term used by Ybema et al. (2009) to describe the study of organizations and their organizing processes—that is, it is interested in understanding sense-making practices, work routines, front stage and backstage activities and the dynamic process of organizing (Ybema et al., 2009; Yanow et al., 2012) by combining "the subjective experience with the historical and institutional dynamics in which these are embedded" (Yanow et al., 2012; p. 356). This way it is possible to show the emotional, power and political dimensions of meaning-making within organizations. Organizational ethnography is different from ethnographies carried out outside of organizational settings because it is multi-site, highly reflexive, and highly relational. Organizational ethnography is multi-sited in that it is characterized by the researcher following actors, actions and artifacts across divisional or organizational boundaries, more than trying to study the entire organizational setting and its functioning. Organizational ethnography is highly reflexive in that researchers are required to "inquire into their own meaning making processes" (Ybema et al., 2009; p. 9). This means that they have to make clear how they experienced the field—that is, what shaped their access to the organization, explaining what their position enabled them to see and what it limited, and how their age, gender or other personal characteristics affected their access to situations or people. In addition, organization ethnography is highly relational in the sense that it recognizes that understanding organization functioning is "co-created in interaction between researchers and participants" (Yanow et al. (2012; p. 367).

The ethnographic study of cooperative work that developed within CSCW studies, on the other hand, is different from anthropological ethnography because it is interested in understanding a specific aspect of work, namely its social and cooperative nature, to make possible the development of collaborative systems.

This means that studying routine patterns, as well as dynamic processes that make it possible to coordinate distributed and interdependent work activities is strongly oriented toward software design. This is why collecting empirical materials is particularly oriented toward understanding the sequential order of work, the material arrangement of

the work space, the rules and procedures that govern work activities and the collection of work descriptions, as well as of video recordings of the actual use of artifacts and work being accomplished (see Crabtree, 2003). The data analysis, given the orientation of these ethnographies toward software design, is not devoted to producing generic descriptions of work, but to explaining work in its real world details by presenting instances that display the object under scrutiny and make it recognizable (Crabtree, 2003; p. 67).

> "The analyst either describes the organization of work abstractly in general theoretical details that are incidental to the work of the site, or concretely, in recognizable details of the real world interactions and collaborations that make up and organize the work of the site. Insofar as the work analyst is concerned to inform the development of collaborative computing systems that are compatible with the actual circumstances of their use, the latter course of description, analysis and representation is defensible course to take" (Crabtree, 2003; p. 71).

The need to match the concerns of ethnographers, that is, to provide the thick description of the setting and long-term fieldwork observation with that of designers to work with structured data within short periods (on this point see Randall et al., 2007; pp. 127-133) for successful software design, has led to new ways of conducting ethnography being identified. Hughes et al. (1994) differentiate between four types of ethnographies that might be used together or separately: the 're-examination of previous studies'; 'quick and dirty' or 'lightweight ethnography'; 'concurrent ethnography' and 'evaluative ethnography'. The re-examination of previous studies consists of re-examining previous research, which informs the initiation of new research. 'Quick and dirty' ethnography aims to achieve a general sense of the setting, more than a detailed understanding. The objective of this kind of ethnography is to identify the aspects of work that can be useful for software design. Concurrent ethnography is on-going ethnography that is carried out during the concurrent system development. In the course of concurrent ethnography the fieldwork, debriefing meetings with designers and development of the software prototype iteratively follow one another. Finally, evaluative ethnography is study undertaken to evaluate already formulated design decisions. In any case, the ethnographic study of cooperative work should not be considered as necessarily limited to informing design. As Randall et al. (2007) put it, in fact, ethnography can be used to

establish and maintain a corpus. Indeed, ethnography undertaken to highlight differences and similarities between similar domains, such as the study of similar types of work carried out in different settings, supports the creation of a corpus of studies that might help researchers find variations of the same phenomenon by comparing the domain under scrutiny with previous results.

Being interested in understanding plans and planning in cooperative work—that is, in how instructions and procedures govern work activities, and in the explanation of work in its real-world details—, this research can be described as an ethnographic study of cooperative work.

4.8 Ethnomethodologically informed ethnography for studying work

While Gubrium and Holstein (1997) identify ethnomethodology as a specific orientation for data analysis in qualitative research, in that it is oriented towards investigating social reality in its accomplishment, Randall et al. (1995) recognize ethnography as the method best suited to the ethnomethodologically oriented study of work. Randall et al. (1995; p. 330), in fact, coined the term 'ethnomethodologically oriented ethnography' to address the application of ethnography to the study of how participants achieve orderliness in the course of their work. Ethnography, in fact, thanks to its orientation towards studying participants from their point of view, allows researchers to answer the ethnomethodological question: "How does work get done?" It also, in particular, allows them to understand how participants organize their work "as-part-of-a-collectivity" (also see Garfinkel, 1996)—that is, how they organize individual activities given that they need to cooperate with others to ensure the continuity of a coherent flow of work. Thus ethnomethodologically-informed ethnography is a valuable tool for understanding how routine work activities are carried out, in that it helps unveil participants' use of 'local knowledge'—that is, the informal knowledge that participants adopt in the everyday accomplishment of their work in order to face the changing circumstances in which routine work activities have to be carried out "whilst giving the appearance of complying with the formal rules" (Randall et al. (1995; p. 335). This means that

ethnomethodologically oriented ethnography also highlights the relevance of human activity for the organization's functioning.

In the opinion of Crabtree et al. (2000; p. 667) ethnomethodologically-oriented ethnography studies developed within the CSCW community made it possible to "bring a social perspective to bear on system design"—that is, to design software taking into consideration the social context in which it is used. Moreover, ethnomethodologically-oriented ethnographies have put forward the need to understand workers not as mere executors of instructions but as competent actors whose knowledge about how to enact procedures is necessary to get the work done; the need to avoid imposing external explanatory frameworks on ethnographic data, and the need to see the setting's daily work as organized by the parties, more than by the analyst (see Crabtree, 2003). In addition Crabtree et al. (2000) recognize that the usefulness of ethnomethodologically informed ethnography for studying work resides in its commitment to understanding how work is produced 'in situ and in action'; in pushing researchers to produce detailed portraits of work practices and in pushing them,

> "Not [to] seek to construct theories that explain behavior but rather [to] seek to make behavior theorized about but glossed over, observable in practized real-world detail" (Crabtree et al., 2000; p. 675).

4.9 The use of ethnography for the study of discursive practices in organizational settings

Ethnography has been exploited extensively by ethnolinguistics (Duranti, 1997; Gumperz and Hymes, 1972; Hymes, 1964) to study how linguistic forms connect with cultural practices. But the need to use ethnography to study discourses in organizational settings is not unanimously accepted.

Among researchers who maintain there is need to draw on ethnography for the study of discourses in organizational settings it is worth quoting Cicourel (1992) and Sarangi and Roberts (1999). For Cicourel (1992), ethnography is necessary to understand the content

of discourses, which within organizations, might not appear as 'transparent' as when analyzing everyday conversations,

> "If a fuller analysis of participants' conversation and ethnographic understandings about activities, objects, and ideas is desired, and that understanding presupposes prior social experience, and/or technical, scientific, or professional training, then other strategies besides a completely local analysis must be employed" (Cicourel, 1992; p. 294).

Sarangi and Roberts (1999), instead, state that the 'thick description' of the workplace that the ethnographic study of the field allows, is necessary for studying discursive practices. Otherwise, in fact, it would be impossible to understand the organizational setting and extra-situational context. In their opinion, ethnography is suited to the study of contexts, thanks to its orientation towards the study of taken-for-granted phenomena as if they were exotic. They suggest collecting empirical materials using different methods that comprise not only the study of discourses but also document analysis and direct observation of work activities, for two main reasons. On the one hand researchers do not share the same interpretative resources as participants do and, on the other hand, they need to achieve contextual knowledge at many levels to be able to adequately catch what happens in the setting under scrutiny. In particular, Sarangi and Roberts suggest analyzing workplace communication,

> "As recipient-designed and sequentially organized; as tuned to local context and participant structure, as drawing on members' background assumption, as argumentation and reasoning with ideological underpinnings" (Sarangi and Roberts 1999; p. 26).

Among the researchers who assert that ethnography is not necessary for studying institutional talk it is possible to quote Maynard and Clayman (1991), who assert that ethnography does not make it possible to understand what occurs in institutional settings in the sense that it does not help us understand whether participants are oriented towards the institutional context when talking, or not. More generally, it is possible to say that among CA scholars there is resistance to relying on ethnography to avoid invoking researchers' sense of the context of talk, instead of that of participants in the analytic phase. This does not mean that CA scholars do not recognize that speakers' identities or

places are relevant to speakers, but that they prefer to examine how speakers orient themselves in terms of contextual features in the course of talk. Schegloff (1992a) maintains that researchers need to show the 'relevancy' of identities or place descriptions—that is, they have to:

> "Show from the details of talk or other conduct in the materials that we are analyzing that those aspects of the scene are what the parties are oriented to" (Schegloff, 1992a; p. 110).

Moreover the analysis of talk must also show the 'procedural consequentiality' between talk and the context in which it occurs—that is, it must be able to answer to the following question:

> "How does the fact that the talk is being conducted in some setting (e.g. 'the hospital') issue in any consequence for the shape, form, trajectory, content, or character of the interaction that the parties conduct?" (Schegloff, 1992a; p. 111)

Similarly, Drew and Heritage (1992) proceed to study institutional talk while aware that it is not possible to describe a talk as an institutional talk simply because it occurs in an institutional setting. In Silverman's (1999; pp. 407-408) opinion this does not mean that ethnography cannot be used for the analysis of talk. He maintains that if the study of talk is oriented to the study of "'how' participants locally produce contexts for their interaction", instead of making prior assumption about the context, then ethnography might be carried out to search for explanation of the observed phenomena.

> "My assumption is that it is usually necessary to refuse to allow our research topics to be defined in terms of, say, the 'causes' of 'bad' counseling or the 'consequences' of 'good' media practice. Such topics merely reflect the conceptions of 'social problems' as recognized by either professional or community groups. Ironically, by beginning from a clearly defined analytical perspective, we can later address such social problems with, I believe, considerable force and persuasiveness" (Silverman, 1999; p. 407).

In addition, Silverman asserts that one can be inspired by Sacks' lectures on conversation (1992) because Sacks has never set up boundaries between CA and ethnography, but stressed the need to observe social activities and to record them both with and without tape recorders.

Samra-Fredericks (2004), instead, claims that blending ethnography, EM, CA and MCA for the study of talk offers privileged access to how local talk is linked with speakers' broader outcomes in organizational settings. In her opinion, in fact, linking EM insights and methods of talk analysis, namely CA (Sacks, Schegloff and Jefferson, 1974) and MCA (Sacks, 1972a, 1972b) with ethnography makes it possible to study macro-phenomena such as the definition of organizational outcomes, by drawing on micro-analysis of talk. In fact, in her study of organization strategizing, Samra-Fredericks draws on ethnomethodology in the sense that, conceptualizing social structures as reproduced by individuals through their making everyday activities 'accountable', helps conceptualize work practices as lived experiences. Ethnography, on the other hand, giving access to participants' background knowledge, provides the researcher with the interpretative resources needed to understand what is brought into play in the observed lived interactions—that is,

> "To understand the ways background expectancies, interests, goals and so forth feed into and provide a 'resource' for interpreting what [speakers] are doing and 'why'" (Samra-Fredericks, 2004; p.133).

Last but not least, the analysis of how participants use membership categorization devices helps understand how "social structures [are made] relevant and consequential for [participants'] work now and for next actions" (Samra-Fredericks, 2004; p.135). Indeed, the study of speakers' categories makes it possible to access how speakers, and not researchers, understand the world, and deploy such knowledge in the course of the everyday accomplishment of work. Study the sequential structure of talk, on the other hand, helps understand how speakers deal with power relations and emotions.

In summary, the combined use of ethnography, EM, CA and MCA allows researchers to conceptualize:

> "Each strip of interaction as a 'minor move' in a succession shaping or producing beliefs, opinions, values, assumptions, feelings perceptions and meanings" (Samra-Fredericks, 2003; p. 152).

Thus by conceptualizing organizational practices as layers of minor moves, this makes it possible to study work practices as interactionally situated and time oriented and to access how talk and settings are mutually constitutive.

This research, drawing on the combined use of ethnography and talk analysis thus is coherent with previous research, having shown that no embargo can be put on the use of ethnography for the study of talk when ethnography is used to study how participants locally produce contexts for interaction.

4.10 Membership Categorization Analysis

Membership categorization analysis (MCA), which has its origins in Sacks' (1972a, 1972b) work, is the study of how people's common-sense knowledge is organized around the descriptions of people and objects and locally used. In Hester and Eglin' s (1997) words, it is,

> "The 'presumed common-sense knowledge of social structure', which members are oriented to in the conduct of their everyday affairs, is locally used, invoked and organized" (Hester and Eglin, 1997; p.3).

The objective of MCA is thus the investigation of how membership categories are used, through which such common-sense knowledge is exhibited, to make descriptions in naturally occurring ordinary activities. The study of common-sense knowledge is possible, making problematic the ordinary sense of talk and action "to produce formal descriptions of the procedures which persons employ in particular, singular occurrences of talk and action" (Hester and Eglin, 1997; p.3). The Sacksian framework analyzing members' categorization work consists of a set of rules that provide for understanding of the mechanisms that support the emergence of inferences and ultimately for understanding people's conversational interactions that depends on the use of categories. In this type of framework 'membership categories' are shared 'inference-rich' devices used to describe persons that "allow to find out a great deal about people" (Silverman, 1998; p. 74). In fact, when we hear that a person is a 'mother' or a 'secretary', we expect that the person described in those terms acts (or does not act) in certain ways and we can assess whether her behavior is coherent with her having being described as a 'mother', 'wife' and so on. Categories are grouped to create clusters or 'membership categorization devices' (MCDs)—that is,

> "Collections of membership categories, containing at least a category, which may be applied to some population containing at least one member, so as to provide, by the use of some rules of application, for the pairing of at least a population member and a categorization device member. A device is then a collection plus rules of application" (Sacks, 1972b p. 332).

This means that some membership categories are understood as aggregated while others not. So, for example, the MCD 'family' may include members like 'mother', 'sister', 'uncle' or 'aunt' but not 'pope' or 'prayer'. In the MCDs it is possible to identify a special type of MCD: the 'relational pairs' whose members have "mutual rights and obligations [so that, for example] each party can properly expect help from the other and the absence of one part of the pair reveals the programmatic relevance of the collection" (Silverman, 1998; p.81-82).

> "If R is relevant, then the non-incumbency of any of its pair position is an observable, i.e. can be proposedly a fact" (Sacks, 1972a; p. 38).

'Husband-wife', 'mother-baby' and 'teacher-pupil' are paired categories that are examples of standardized relational pairs.

In addition, MCD might be 'duplicatively organized':

> "I mean by the use of that term to point out the following: When such a device is used on a population, what is done is to take its categories, treat the set of categories as defining a unit, and place members of the population into cases of the unit" (Sacks, 1972b; p. 334).

This means that if we hear the expression "The baby cried, the mommy picked it up" (Sacks, 1972b) we understand the baby to be the mother's even if possessives are not used because these terms are heard as belonging to the MCD 'family' which represents a unit or a team. A hearer maxim corresponds to the duplicative organized MCD:

> "If some population has been categorized by use of categories from some device whose collection has the 'duplicative organization' property, and a Member is presented with a categorized population, which *can be heard* as co-incumbents of a case of that device' s unit, then hear it that way" (Sacks, 1972b; p. 334).

Among the MCD rules of application it is possible to identify the 'economy rule and the 'consistency rule'. The 'economy rule' states that only one category suffices for the

description of a member of some population even though several categories could be used to describe a person (Sacks, 1992; p. 246). The 'consistency rule', instead, holds that once one category from a MCD is used, "other categories of the same MCD might be used to describe other members of the population" (Sacks, 1972b, p. 333). This implies that, as Silverman (1998; p. 80) clearly explained, if we use an offensive term to describe a person, then a term from the same collection can be used on us.

The 'hearer maxim', instead, holds that,

> "If two or more categories are used to categorize two or more members of some population, and those categories can be heard as categories from the same collection, then: hear them that way" (Sacks, 1972b 337).

This means, as Sacks (1972b) showed, that if we hear somebody saying "The baby cried, the mommy picked it up" it is assumed that the mommy and the baby belong to the same MCD 'family' and we do not hear the term 'baby' as referring to the MCD 'stages of life'.

The term 'category bound activities' refers to the fact that members that belong to a particular MCD are envisaged to accomplish specific activities, and that these activities are perceived as properly done as done by the members of that device. It is worth noting that category-bound activities and categories are co-selected. This means that if we describe a certain activity we must describe it as done by the member of the corresponding MCD.

A second hearer maxim holds that if an activity is bound to a category of an MCD then that activity is heard as having been accomplished by a member of that category.

> "If a category-bound activity is asserted to have been done by a member of some category where, if that category is ambiguous (i.e. is a member of at least two different devices) but where, at least for one of those devices, the asserted activity is category bound to the given category, then hear that at least the category from the device to which it is bound is being asserted to hold" (Sacks, 1972b; p. 337.

The understanding of expressions is the result of the combined use of the hearer maxims and the 'consistency rule corollary'. So when the expression: "The baby cried, the

mommy picked it up" (Sacks, 1972b) is heard, the baby is understood as being the mommy's, as they are members of the MCD 'family' and recognize 'crying' as a proper category-bound activity for a baby that is a member of the MCD 'family', even though a baby might belong to the MCD 'stages of life'.

Sacks identified two viewer' maxims as well. The first one holds that seeing a certain activity allows for the identification of the doer of the activity as a member of a certain MCD if the activity has a special relevance for a category of a certain MCD.

> "If a member sees a category-bound activity being done, then, if one can see it being done by a member of a category to which the activity is bound, then: see it that way" (Sacks, 1972b; p. 338).

The second viewer's maxim instead focuses on the inferences that emerge from the relationship between the identity of persons, norms and actions.

> "If one sees a pair of actions which can be related via the operation of a norm that provides for the second given the first, where the doers can be seen as members of the categories the norm provides as proper for that pair of actions, then (a) See that the doers are such-members and (b) see the second as done in conformity with the norm" (Sacks, 1972b; p. 339).

This means that if, for example, it is a norm that a mother picks up her baby when she cries, the viewer can explain the occurrence of one activity given the occurrence of the other, explain the sequential occurrence of activities, and infer the identity of the doers. In other words, it is possible to say that the link between categories and their inferences is normative by nature.

4.11 The expansion of the Sacksian understanding of MCA

The use of the Sacksian framework for understanding how people use and understand descriptions has contributed to the creation of a corpus of studies that, over the years, have expanded MCA by investigating MCA as ethnomethodologically-oriented and by clearing up the relationship between MCA and CA.

4.11.1 The ethnomethodological stance on members' categorization work

Hester and Eglin (1997; p. 22), even while recognizing the brilliance of Sacks' work, maintain that it is ambiguous in that "it exhibits two contrasting approaches to the study of membership categorization devices, membership categories and category predicates". In their opinion, in fact, it is possible to recognize in Sacks study of membership categorization two alternative tendencies, namely the decontextualized and the ethnomethodological ones. The decontextualized model consists of treating knowledge and culture as sense-making resources that are independent of language use and that members can use to make sense of their environments.

> "Membership categorization devices are endowed with a thing-like quality, lying behind, pre-existing their use in particular instances of membership categorization […] an apparatus to be taken up and used and which is pre-formed resource for doing description" (Hester and Eglin, 1997; p. 15)[3].

This means that from such a perspective MCDs are intended as pre-formed resources for describing the ordinary sense of expressions. The decontextualized use of categories can be traced in Sacks (1992) description of some MCDs, such as 'family' and 'sex' as 'fixed'—that is, as always composed by the same categories. In fact, his distinction between 'natural devices' and 'occasioned devices' the former being devices whose members are pre-given and the latter devices whose members cannot be known without knowing the topic that provides for the relevance of the device, can be understood as fostering the existence of a culturally pre-given structure of knowledge and of the rules of its application that speakers and hearers use in the course of their talk to identify people or link identities and actions. But this same distinction can be understood as putting forward a decontextualized approach to the study of categories as well. In fact, Sacks recognizing that MCDs might collect different members, suggests that Sacks was aware of the local and situated character of membership categorization devices and category predicate, and that his explanations of MCDs are the outcome of the analytic work necessary to explain how MCDs are used in the course of interactional episodes. The contextualized approach thus consists of recognizing "the local specifics of

[3] Watson (1997) makes similar considerations.

membership categorization" (Hester and Eglin, 1997; p. 18) and recognizing that the fact that members use the same MCDs in the course of different interactional episodes does not mean that they are pre-given, but instead that certain MCDs are more relevant for members than others. Hester and Eglin (1997) claim that Sacks' recognition of the dependence between the topic of talk and membership categorization work and his recognizing the ambiguity of membership—that is, the possibility for the same categorical word to occur in several MCDs assuming different references (Sacks, 1972b), as signs of the ethnomethodological orientation of his concerns. In summary, the ethnomethodological stance on MCA recognizes membership categorization as locally situated activity and membership categories, membership categorization devices, and category predicates as indexical in nature. MCD are therefore deemed to be "in situ achievements of members' practical actions and practical reasoning" (Hester and Eglin, 1997; p. 27). Categories are grouped with others through their use in particular contexts so, for example, the MCD 'family' on certain occasions might include members such as 'mother', 'father', 'aunt', etc., while in others might include members such as 'cat' or 'nurse' depending on the topic at hand (Sacks, 1992). In addition the ethnomethodological stance on MCA implies recognizing culture as constituted in action.

> "[It] is not just that members use culture to do things, but that culture is constituted in, and only exists in, action. For membership categorization analysis, this means that the orderliness of cultural resources (categories, devices and the rest) is constituted *in their use* rather than *pre-existing* as a *machinery* for whatever uses members might want to put them to" (Hester and Eglin, 1997; p. 20).

This conceptualization of members' categorization work is thus consistent with Garfinkel's rejection of the idea that people produce "the stable features of society by acting in compliance with pre-established and legitimate alternatives of actions that the common culture provides" (Garfinkel, 1972; p. 24).

The ethnomethodologically oriented study of members' use of categories that consists in the study of the use of membership categorization devices, membership categories and

predicates as a practical accomplishment in local settings, is the frame that informs the analysis of members' talk collected over the course of this research project.

4.11.2 Debating the relationship between MCA and CA

Even though both MCA and CA emerge from Sacks work, there is no univocal position among scholars about the possibility of using MCA and CA conjointly. Schegloff (1992b) considers this divide unavoidable because it is rooted in the Sacksian recognition of the analytic weakness of MCA. Presenting Sacks lectures, Schegloff, (1992b) maintains that,

> "Sacks abandoned the use of 'category bound activities' because of an incipient 'promiscuous' use of them, i.e., an unelaborated invocation of some vernacularly based assertion (i.e., that some activity was bound to some category) as an element of an account on the investigator's authority, without deriving from it any analytic pay-off other than the claimed account for the data which motivated its introduction in the first place" (Sacks, 1992; pp. xiii).

He (Schegloff, 2007) also claims that the effort to constitute a new field of research based on MCA is without any foundation.

> "I do not believe one can establish a new field simply by announcing it, or by announcing that one intends to confer such a status to an already existing line of work, especially if it does not involve consequential new initiatives in the underlying thrust of the work" (Schegloff, 2007; p. 477).

Fitzgerald (2012; p. 310), instead, is skeptical about the possibility of a mutuallly beneficial engagement between CA and MCA if this would mean MCA being subsumed by CA. In fact, he claims that MCA does not need to be tied to CA because MCA has a different area of analysis. While CA focuses on the study of the sequential structure of interactions of naturally occurring conversations, MCA, which focuses on the participants' use of categories, can be applied to the study of different corpora, which include but are not limited, to speech exchanges. MCA, in fact, can be used to analyze interactions as well as of textual material (see Eglin, Hester, 2003; Watson, 2009). In addition, MCA's strength resides in its being potentially relevant to any discipline "interested in aspects of identity and social knowledge, *including* CA" (Fitzgerald,

2012; p. 307) and in its drawing on an analytic toolkit that, thanks to its simplicity, can be used to answer different types of research questions.

> "It is the very flexibility of these tools as aids to a sluggish (analytic) imagination, rather than as a process of application, that is at the heart of and success of MCA" (Fitzgerald, 2012; p. 308).

Moreover, Housley and Fitzgerald (2002) assert that maintaining that Sacks abandoned the study of the use of categories, is misleading since both MCA and CA are manifestations of Sacks concern with understanding 'recognisability in conversation'. Recognizability refers to actors' carrying out their actions, such as a request or a prayer, as recognizable actions, and to their being engaged in the recognition of actions for the orderly accomplishment of local interactions. Since Sacks work shows that recognisability can be understood both by studying the sequential organization of talk and the participants' methodical process of categorization, in Housley and Fitzgerald's (2002) opinion researchers should inform their analysis of interactions by considering not only the sequential organization of talk but also participants' categorization work. Carlin (2010), instead, asserts that Schegloff's refusal to recognize MCA as a self-standing fully-fledged analytic approach is biased by his not recognizing the developments that have occurred in the field.

> "[He] neglects areas of MCA [because of his]; obstinately adhering to Sacks' original formulations whilst at the same time failing to account for developments in MCA that have addressed deficiencies within Sacks' formulations" (Carlin, 2010; p. 257).

Without going further into this debate, it is possible to say that fortunately this lack of consensus has not limited but urged MCA scholars into different analytic endeavors exploiting MCA and CA both separately and together, as the following paragraphs will show.

4.11.3 Linking MCA with CA

Watson (Watson, 1997) not only maintains that MCA and CA can be combined for the analysis of speech exchanges, but also shows how their combined used can enrich the analysis of talk. In Watson's opinion (Watson, 1997) MCA and CA have developed in

quite separate ways in that they have been considered as being in a "gestalt-type relationship". As a consequence, focusing on the categorization work has made sequentiality recede from view as focusing on the sequentiality of talk has left behind the study of participants' categorization work. In Watson's opinion, because of this, CA scholars have systematically underestimated how sequential analysis relies upon members' categorization work. Moreover, they have fostered the idea that the sense of utterances is sequentially given to a greater extent than is really warrantable, and the idea that sequential organization possesses freestanding status in the analysis of talk.

> "At present the sense of much sequential analysis relies upon an analytically unexplicate resource, namely the categorical order of the conversation under scrutiny … [but] the disattended nature of such categorical resources does not mean that they have no power in the utterance-by-utterance sense-making process" (Watson, 1997; p.53).

Watson (1997), on the contrary, suggests overcoming this dualism and seeing sequential and categorical aspects of utterances as reflexively tied and mutually constitutive in that in his opinion "the interlocutor or analyst operates a 'back-and-forth' procedure between the two aspects in imputing sense to talk" (Watson, 1997; p. 54). He routes his analytic claims in Garfinkel's (1967) formulation of the documentary method of interpretation explaining that if members' lay sense-making practices draw on taking particulars of social actions as 'indexing' an underlying pattern, then not only is "the meaning of pattern and particular(s) reflexively determined and reinforced in a circular 'feedback effect'", but "particulars gain meaning from each other too" (Watson, 1997; p. 55).

Drawing on these assumptions, it is possible to understand that conversational sequences are categorically instructed and, for example, to notice that the consistency rule works for achieving specific situated relatedness between utterances in a given sequence.

> "If a question contains one membership category and an answer contains another, and if the two categories may, *via* the consistency rule, be seen as deriving from the same membership categorization device (or the same standardized relational pair) then this may comprise one tying procedure for establishing the specific relatedness of *just this* answer to *just this* question, here and now" (Watson, 1997; p. 59).

This means that it is thanks to the application of the consistency rule, and not only the application of the sequential analysis of talk, that it is possible to understand that a certain answer is specifically related to a certain question in the course of their production. Moreover, Watson notices that Sacks (1992) himself has recognized the relationship between sequentiality and categorical work, as shown by his distinguishing between 'turn-generated categories' and 'category-generated turns. 'Category-generated turns' are orders of turn generated by features external to turn organization, such as age or gender. So, for example, category-generated turns are those in which, say, the age of speakers determines who can speak first. 'Turn generated categories', instead are "identities for conversation generated through the turn-organization" to which speakers show they are oriented (Watson, 1997; p. 67). In a telephone conversation, for example, the categories 'caller' and 'called' are turn-generated and relevant for the speakers who recognize such identities as loci of moral imputations. In fact, they recognize that it is the caller who is characteristically accountable for giving out the reason for the call, while it is the called who can initiate an invitation to close. Because of that, the categories 'caller' and 'called' have effects on the categorical distribution of speakers' actions —such as the offer sequence—and, as a consequence, on the topic organization of talk.

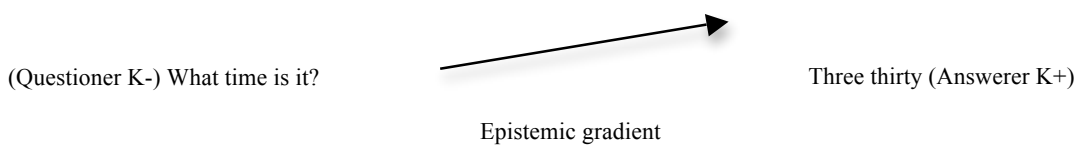
In Watson's (1997) opinion, Sacks analysis of the caller-called standard relational pair not only helps understand Sacks as recognizing the contextual treatment of categories, but it also helps to recognize talk as morally organized in a way that the sole sequential analysis of talk does not permit. Watson also maintains that categorical identities are relevant not only for conversations, but also for non-conversational interactions. So, for example, it is possible to recognize that people waiting in a queue act according to a set of category-bound obligations. The next in line, for instance, has to monitor the ongoing transaction at the counter to detect its completion point. In addition, people in a queue show that they take into consideration 'distal categories'—that is, membership categories that apply to the members of the queue that are not 'turn-generated' but that entitle those persons to special rights. In fact, if a disabled person joins the queue, she is permitted to move to the front of the queue irrespective of the order of arrival.

To sum up, Watson's work highlights the need to study that the "categorical and sequential aspects of talk are reflexively related or mutually determined" (Watson, 1997; p. 73) and therefore to address both of these two aspects of interactions during the analytic process.

More recently Mondada (2013) recognized the influence of Watson (1997) and Sacks (1992) work on the reflexive relation between structural and categorical aspects of talk in the development of CA research pursued by Heritage's study of epistemics in talk. Heritage (Heritage 2012a, 2012b; 2013b), in fact, puts forward the idea that speakers cannot avoid displaying that they are oriented to their knowledge "of what each knows about the world" (Heritage, 2013; p. 370)—that is, to their epistemic statuses and to the relative distribution of epistemic rights between them (see Heritage and Raymond, 2005). He asserts that speakers take for granted that they have comparative access and knowledge of some domains of knowledge and that speakers show this type of information imbalance in the design of talk. So, for example, a person asking for some information from another, indexes an 'epistemic gradient' between the two, in the sense that,

> "[Questioners] claim to be unknowing about the state of affairs they are asking about *relative to the recipient.* Simultaneously, [questioners] establish the recipient as relatively knowledgeable about the matter. [In addition], by projecting respondent as knowledgeable, questioners generally commit to the idea that the response will be informative and that, once the response is provided, they will be informed (and the epistemic gradient will have been made level)" (Heritage and Clayman, 2011; p. 25).

Fig. 4.2: Epistemic gradient (Adaptation from Heritage and Clayman, 2011)



Heritage (2012a; pp. 32-33) introduces the terms 'epistemic status' and 'epistemic stance' to respectively address the speakers' recognition that they have comparative access to certain domains of knowledge "as a more or less settled matter of fact" and their moment-by-moment expression of this relationship in and through the design of turns at talk. The term 'epistemic status' thus highlights that normally access to domains of information is stratified between participants so that "equality of epistemic access may be restricted to specifically shared (ordinarily simultaneous) experiences of persons, objects and events". The concept of 'epistemic stance' instead highlights the fact that speakers can design their own talk to appear more or less knowledgeable than they really are. It is worth noticing that Heritage recognizes that epistemic status is not immutable in that it can vary over time "as a result of interactional contributions" (Heritage, 2012b; p. 5).

4.12 Further developments in MCA

Housley and Fitzgerald (2002) maintain that MCA has evolved in different directions since its conception thanks to research that expands our understanding of how MCA and CA can support each other; of the use of personalized and non-personalized MCD; of the relationship between categories and the moral organization of talk; and of the relationship between categories and knowledge. The following paragraphs retrace Housley and Fitzgerald' s taxonomy to integrate and expand it with more recent developments in MCA.

4.12.1 Research on personalized MCD

As Benwell and Stokoe (2006) point out, MCA significantly contributes to ongoing studies on identity that conceptualize identity as "performed, constructed, enacted or produced, moment-to-moment, in everyday conversations" (Benwell and Stokoe, 2006; p. 49) and that recognize language and interactions as tools for this kind of identity-construction work. MCA's toolkit, in fact, makes it possible to study identity as ongoingly co-constructed, in that it sheds light on the layers of the identity-construction

work that might occur in the course of interactions. In particular Benwell and Stokoe's (2006) maintain that the concepts of 'turn generated category', of 'perceptually-available category' and of 'situated identity' are particularly suitable for understanding the ongoing accomplishment of participants' identity work. The 'turn generated categories' are the categories generated by specific turn types such as caller-called, repair-initiator, story-teller/story-recipient and so on (Sacks, 1992). These identities are the ones that people "inhabit in the course of talk's practical activities" to which rights and obligations correspond. 'Perceptually-available categories' (see Jayyusi, 1984) are the categories generated by the elements that make the identification of individuals in terms of gender, ethnicity and age, possible at first glance. The 'situated identities', on the other hand, are the identities that come into play in specific situations. Examples of 'situated identities' are the roles that speakers inhabit in situated interactions such as citizen-complainant during a call to the police or relational identities such as friend, mother or political affiliate. Moreover, in Benwell and Stokoe's (2006) opinion, studies on membership categorization work helps understand that speakers can enact identities even without using category-terms, but that they can show their identities by engaging in conduct that is typically attributed to a certain category given the relevance of a specific MCD. So, for example, one speaker can try to identify herself as 'helper' by offering assistance to somebody who apperas to be in need. In Benwell and Stokoe' s (2006) opinion, the sensitivity of MCA to the dynamic accomplishment of identities comes from its being EM-oriented in the sense that EM, by not being interested in the definition of the ontological status of identity but by its being inclined to approach the study of identity by looking at how members orient to identity and to their considering it as a real thing, a plurality of realities, a stable reality or as inconsistent, helps understand people's descriptions as used in real-time interactions, more than in the abstract, and helps focus on what members do with people's descriptions in the course of their interactions.

4.12.2 Research on non-personalized MCD

Studies on the use of non-personalized MCDs are those that focus on the use of categories for the description of objects.

Schegloff (1972) shows the relevance of membership categorization work selecting terms for the formulation of locations. In fact, he maintains that the formulation of locations depends on the speakers' knowledge of each other's positions; on their orientation to the activity being accomplished in an interaction, and on how speakers categorize each other. So, for example, the formulation of location depends on the speakers knowing whether they are or are not in the same place. In addition, if a speaker is categorized as a stranger on the basis of his requiring information about how to reach a certain place that identification has relevance to the way places are described. Places, in fact, can be described using or not using terms in relation to members, such as 'Bob' s house', but the selection of the term to be used is always made on the basis of its being expectably recognizable by the person who receives.

> "A 'right' formulation exhibits, in the very fact of its production, that it is some "*this* conversation, at *this* place, with *these* members, at *this* point in its course" that has been analyzed to select *that* term" (Schegloff, 1972; p. 115).

McHoul and Watson's study (1984) of how commonsensical geographical knowledge is transformed into formally approved geographical knowledge in classroom talk is another significant attempt to apply MCA to non-personalized categories. They show that the teacher mobilizes the students' commonsense geography by setting up "a paradigm set comprising a category, its MCD and corresponding CBAs for *that* category from *that* device" (McHoul and Watson, 1984; p. 288) and then proffering affiliate or disaffiliate elaborations of the students' positioning categories into the MCD on the basis of their having or not having the CBAs provided by the paradigm. McHoul and Watson warn researchers of the difficulties that applying the MCA to non-personal topic entails. In particular they note that the relationship between categories, and category-bounded activities of non-personalized categories, is much more general than that which connects persons with category-bounded activities. Therefore it is possible to apply Sacks' original model to non-personalized MCDs at the cost of losing part of its analytic power (McHoul and Watson, 1984; p. 290).

More recently, Myers (2006) and Housley and Smith (2011) have suggested the necessity of studying 'place talk' to understand the ways participants describe place to

construct locally relevant identities and to accomplish moral work—that is, the judgmental work that descriptions make available in situated interactions. This implies moving from the assumption that place names define identities and locations in a stable manner, to the study of speakers' accounts over subsequent turns to understand how they select categories and revise them in accordance with speakers' interpretative and interactional reasoning.

> "The mundane categorization of place is not an empty canvas that merely refers to geographical or material contours. It is inhabited by groups and types of people, thoughts and feelings, atmospheres and 'recollected experiences'. What is of interest is how these different accounts of order and actions are assembled in relation to the setting they are elicited within. These assemblages are a central component of the everyday practices of the tribe of mundane reasoners that inhabit such spaces, thus rendering them as actual places" (Housley and Smith, 2011; p. 711).

4.12.3 Fostering the combined study of categorization 'work' and of the sequential structure of talk

As introduced in paragraph 4.11.3, Watson's (1997) seminal work shows that the local production of social order needs to be investigated, focusing both on participants' use of categories and the sequential structure of talk. Following Watson, Housley (2000a; 2002), Housley and Fitzgerald (2003) and Hester and Hester (2010) further investigate the relationship between the categorization work and the sequential organization of talk.

Housley (2000a) applies CA and MCA insights to studying stories in members' talk during team meetings to foster the multi-dimensional study of stories developed within organizational settings. Sequential components within talk are investigated as they support the local organization of team meetings, while the use of categories is studied in the sense that "the categories displayed within the story facilitate and 'point to' the information that the 'story teller' wants to be heard" (Housley, 2000a; pp. 427-428). Housley combines analysis of the sequential structure of talk and categorical work drawing on Watson's (1997) work, which he describes in terms of 'reflexive monitoring'—that is, the "mutually constitutive process of category display and sequential organization/management" (Housley, 2000a; p. 430). This way he succeeds in

showing how information is exchanged during team meetings thus providing insights into how teamwork is accomplished.

Differently, Hester and Hester (2010), studying how children constitute their category relationship during an argument, show that category relations during a children's argument depend on children's setting up precise conversational actions—"a succession of action-opposition sequences" (Hester and Hester, 2010; p. 37)—through which the attempt of one of the party to degrade the other are set up and resisted.

> "The brother could be heard to degrade his sister via his conversational actions – directives, accusations, enacted descriptions, mimicry and mockery- whilst she in turn resists them trough her rebuttals, accounts, counter-enacted descriptions and other oppositionals … The argument was also organized categorically; it was recognizably about the category relationship between the children, and the sequential structures were deployed in the service of their dispute" (Hester and Hester, 2010; p. 44).

This type of study thus sheds light on how the sequential organization of interactional moves allows for the local definition of interactional identities.

Housley (2002) and Housley and Fitzgerald (2003) link the study of the sequential organization of talk, categorization work, and participants' normative assessment. This way they identify particular forms of adjacencies they call 'moral devices' (Housley and Fitzgerald, 2003) that they recognize as privileged sites for the observation of the interplay between categories, sequence and normativity.

> "These devices are often characterized in terms of a procedural-relational pairing, in the sense that two categories are not only normatively tied, but also that one follows the other" (Housley and Fitzgerald, 2003; par. 4.1).

"Blame→punishment" and "intention-avowal→action" are examples of moral devices identified by Housley and Fitzgerald (2003). Moral devices are resources used by participants to make actions normatively accountable. When such devices are introduced in talk-in-interaction to highlight discrepancies between the categories of the moral device, they raise normative issues. So if, for example, in the course of a public event a discrepancy between the publicly declared commitment of one politician to do something and his subsequent failure to fulfill it is presented, then this is done to

highlight a normative breach that, in turn, can be used to obtain other interactional objectives, such as presenting the politician as untrustworthy or incompetent. The use of moral devices often has consequences for the organization of subsequent talk in that the addressee might resist such attributions by engaging in further categorization work or trying to create topical incoherence.

4.12.4 Categories and the accomplishment of interactional actions

Drew (1978), Watson (1978) and Sharrock and Turner (1978) use MCA to show how participants succeed in carrying out specific interactional actions.

Drew (1978) investigates the use of MCDs to make accusation during questioning in the course of a trial. In particular, he focuses on the use of the descriptions of locations to enact accusations. Drew notices that names of places such as 'Sandy Row', can be used as categories when interactants share the same knowledge of the 'religious identity' of streets, areas, ends of streets, etc. In fact, by using street names to refer, say, to people's origins, knowledge of their identities is invoked "to identify persons as members of that religious group to which the street, etc., belongs" (Drew, 1978; p. 9). So, for example, naming the place of origin of clusters of people within a crowd can be used to make distinctions between the cluster and the rest of the crowd and, for example, to infer that the presence of one group in the area known as being owned by another group is not accidental, but carried out with hostile intentions. The use of descriptions of location is thus relevant in that it enables the identification of the aggressors and the evaluation of the appropriateness of police action.

Watson (1978) focuses on the use of MCD in blame negotiation in conversation. Studying telephone calls at a suicide prevention centre, he develops the concept of 'incumbency' to address a specific strategy members use to present themselves and others as belonging to a certain MCD and therefore as having category-bound entitlements, obligations and knowledge. Watson has developed the concept of incumbency to explain that blame can be attributed by presenting somebody as incumbent of a certain category, and thus entitled to a certain type of treatment, and then highlighting somebody else's lack in recognizing that treatment.

> "One activity which members can achieve through categorization is to claim incumbency as a means of presenting themselves as being heir to the relevant category-based entitlements" (Watson, 1978; p. 108).

In addition, blame can be attributed when a person is presented as incumbent of a certain category to highlight that she is lacking in the accomplishment of the expected category-bound obligation and when a person enacts obligations tied to a category she does not belong to. In such a case, in fact, that person can be addressed as usurping incumbency of another category.

Sharrock and Turner (1978) show that the use of MCD is necessary to formulate complaints, for example when presenting a caller's problem to police. In particular, they show that MCDs are used both to construct accounts that serve the caller to make a complaint, and to protect the caller from being misinterpreted. On the one hand, in fact, by presenting who is carrying out certain actions, categorical formulations provide ways of seeing events. So for example, saying that kids are dismantling cars might help understand that the complaint is not about a criminal activity but about a neighborhood nuisance. In addition callers use categories and category bound activities to prevent equivocal interpretations of their claims. So, for example, a caller presenting herself as a housewife, as having children, or as being at home all day, serves to assure police that her call is not suspicious but bona fide and thus deserving of police intervention.

4.12.5 Categories and knowledge

Sharrock (1974) and Housley (2000b) contribute to understanding the relationship between categories and knowledge by focusing on the relationship between members' categorization work and the organization of members' knowledge.

Sharrock (1974; p.50) notes that it is possible to conceive of a corpus of knowledge as a collectivity's corpus when it is understood that there is "an ownership of the corpus by a particular collectivity". Indeed, using the idea of ownership it is possible to understand how people use collective terms to describe the world. For example, it is possible to understand why, say, the term 'Chinese medicine' is never used to refer to medicine applied by a Chinese person, and why the same term can be used to describe the kind of

medicine practiced by a French doctor. In Sharrock's opinion, the concept of ownership helps explain this because,

> "Once we treat objects as being owned we need not modify ownership descriptions on the grounds that persons other than the owner are now in possession and use of them, though we can describe the activities of those other persons by reference to the owned character of the object and perhaps reconceive their relationship to the owner Sharrock" (1974; p.50)

In other words,

> "The assignment of a name to a corpus [makes that that term] is not merely descriptive in that once it has been assigned it becomes a device-for-describing: that is, the name is not to be revised in the light of events but is, rather, to be invoked in the description of whatever events occur Sharrock" (1974; p.49).

Housley (2000b), on the other hand, highlights that members' displays of knowledge are always situated. By analyzing team meetings, Housley (2000b; p. 83) shows that "knowledge is an emergent and occasioned product of the team's interaction". He shows that participants in the meetings are not considered knowledgeable per se*,* but in and through the members' recognizing their knowledgeablility as it is constructed by means of the sequential structure of talk, of the members' categorization work, of the design of talk with reference to the interlocutors' identities, and of the appraisal and demotion of accounts. An example of this is the receiver's upgrading previous displays of knowledge by highlighting elements of previous talk because of their relevance to subsequent work.

4.12.6 Categories and moral reasoning

Jayyusi (1984; p. 20) investigates extensively how moral matters are bound up with actors' categorization work—that is, the work members do to categorize other members to accomplish various practical tasks. She shows that "categorization work is embedded in a moral order" and that descriptions of persons are morally implicative in character. Not only does she study the use of culturally available category-concepts, such as 'murder', that are explicitly moral, but she also uncovers the relationship between membership categories and category-bound obligations and rights.

> "Membership categorizations have a moral organization and moral features and routinely operate within a moral context. More precisely, membership

> categorizations such as doctor, mother, brother, friend, etc. have category-tied rights and obligations that inform their practical use and members' practical assessment" (Jayyusi, 1984; p. 208-209).

Categorization work is thus "descriptive and ascriptive and involves both judgmental and inferential practices" (Jayyusi, 1984; p. 4). This implies, for example, that the Sacksian notion of 'category bound actions' can be used to show the moral properties of knowledge to which ascriptions, inferences and judgments correspond. So when we describe a person using the category-term 'doctor', not only do we expect that she has a corpus of expectable skills and abilities, but when that same person is described as one who "could have saved a life with her skills and resources and did not, she may be seen to have purposely caused the patient's death" (Jayyusi, 1984; p. 43). Moreover, Jayyusi recognizes that categorization work, even though it draws on already culturally available category-concepts, is always situated, in that people can and do produce descriptions by accompanying categories with adjectives, or by sequencing lists of categories, thus making inferential trajectories available in situ according to their interactional purposes. In other words, Jayyusi promotes the study of morality as a practical matter, that is, as the members' intersubjective recognition of the local adequacy of members' actions and omissions and suggests engaging in this endeavor by focusing on members' categorization work as it emerges from their accounts.

As noted by Eglin and Hester (1992; p. 264), the richness of Jayyusi's work lies precisely in her having "produced numerous stimulating and thought-provoking insights into MCD matters" and in her shedding light on moral inferential logic of everyday social practices coherent with the EM inquiry tradition.

As mentioned previously (par. 4.12.3), Housley (2002) and Housley and Fitzgerald (2003; 2009) explore how categorization work, sequentiality, and moral work are realized within various adjacency-pair formats in public domain debates. They identify two forms of categorization sequences, namely 'contrast devices' and 'moral relational pairing' that apply to both personal and non-personal categories. 'Contrastive devices' are "categorization sequences in the sense that one device follows the other as a method for assembling difference" (Housley and Fitzgerald, 2009). So, for example, when the

pronouns ‘us’ and ‘them’ are used to constitute one category whilst excluding specific others on the basis, say, of public behavior, a contrast device is created.

Housley and Fitzgerald (2009; pp. 353-354) claim that ‘contrastive devices’ are resources that can be used to characterize persons, groups, and collectivities and to formulate next-turn activities in that they “generate accountability in terms of binary normative contrast that reduces the complexity of events, reported activities or claims”.

‘Moral relational pairings’, or ‘moral devices’ are “resources through which actions can be made normatively accountable” (Housley and Fitzgerald, 2009; p. 354). As previously explained, they are “procedural-relational pairing, in the sense that two categories are not only normatively tied, but also that one follows the other” (Housley and Fitzgerald, 2003; par. 4.1). So, for example, the ascription of a discrepancy between stated intentions and actions to an individual or a collective constitute a normative breach that, in turn, can be used to obtain explanations or to pursue other interactional objectives, such as to discredit or blame. Moral devices, as noticed by Housley and Fitzgerald (2009; pp. 358), are “normative particles” produced locally out of “situated action and categorization work”, they are open to empirical scrutiny, they have a ‘temporal-moral relation’, and they are used to generate particular versions of social reality.

Stokoe (2012), on the other hand, shows that idiomatic expressions and categorical formulations can be used to do moral work in that they allow members to organize oscillations between individual actions and category action. Drawing on Drew and Holt’s work (1988) for analysis of talk on gender issues, she shows that individual actions can be cast as actions typical of a certain category to carry out moral work. So, for example if one person says that “all men are bastards” to comment on a specific man’s behavior, it is possible to understand that she is using the categorical formulation to describe that specific man as a bastard because of his belonging to the category ‘men’. In addition such an evaluation of the man’s behavior is difficult to challenge, in that idiomatic expressions and categorical formulations, removing the circumstantial details of talk, are difficult to test empirically.

4.12.7 Methodological concerns

Stokoe (2012) notices that, despite the fact that several research projects draw on MCA, a systematic definition of how MCA should be carried out is still lacking, undermining the possibility of MCA scholars to generating new insights into members' categorization work. This is why she (Stokoe, 2012; pp. 277-281) asserts it is necessary for MCA scholars to undertake systematic studies of the fundamental categorical practices of members drawing on the following guiding principles:

- to collect data across domestic and institutional settings in a purposive or unmotivated manner. Data, in fact, may be collected following a priori interests or after having noticed a specific use of one or more categories that are interesting to investigate across different contexts. Data might be collected by studying talk-in-interaction but also textual materials;
- "to build collections of explicit mentions of categories, MCD, and category-resonant descriptions";
- "to locate the sequential position of each categorical instance within the interaction (or text)";
- "to analyze the design and action orientation of the turn or text in which the category or resonant description appears";
- "to look for evidences of the recipients' being oriented to the categories or category-resonant descriptions; of the interactional consequences of a category's use; of co-occurring component features of categorical formulations; and of the way speakers within and between turns build and resist categorizations".

Fitzgerald (2012), even while recognizing the originality of Stokoe's approach to the study of membership categorization work, does not share her need to identify guiding principles to carry MCA out. On the contrary, Fitzgerald (2012) notes that Stokoe's methodological approach cannot be used for the execution of ethnomethodologically informed research based on the study of a single case.

> "The first and second guiding principles regarding data collection … are irrelevant to an ad hoc collection or ethnomethodologically grounded thick

> description of a single case in which the layered depth and texture of members' category work is explored" (Fitzgerald, 2012; p. 309).

In Fitzgerald's (2012; p. 309) opinion, Stokoe's methodological approach, promoting the understanding of participants' use of common cultural knowledge across different settings, implies drawing on the "'decontextualized' model of MCA, which treats category as a window on a pre-existing and transcendental version of the social world", rejected by the ethnomethodological approach of MCA. Fitzgerald instead suggests that MCA should explore "members' use and display of categorical orientations within and as part of doing *their* social work within the sequentially layered texture of *this* event". For this purpose, researchers should focus on the participants' orientation to the context; on inference making work; on "the use and deployment of social norms of behavior and moral accountability (Sacks, 1972; p. 224); [and on] the exploration of 'emergent' social identities made operative, relevant and consequential over the course of the interaction".

4.12.8 Categories and context

Hester (1994) explains that when members' categorization work is investigated from the ethnomethodological perspective (Hester, 1994; Hester and Eglin, 1997), categories and MCD are understood as being indexical in nature. Categories are not considered stable and culturally defined structures that people possess, but situated phenomena made recognizable by members' methodical procedures during their interactions. This implies, for example, that is not possible to define once and for all which categories belong to a certain MCD, since categories are associated with MCDs in an occasioned and contextual manner. But this also means refusing to conceptualize context as a "set of social, cultural, environmental, or cognitive factors impinging upon specific instances of conduct as though from outside" (Lynch and Perot, 1992; p. 114), but recognizing context and categories as reflexively tied.

> "Ethnomethodology refuses the idea that categories and the context of their occurrence are separated. This neither means that the context determines the use of categories nor that the context is independent and external to categories; a sort of container that determines the categories' use… From the point of view of ethnomethodology categories and their context inform each other and are not

> separable. For ethnomethodology the phenomenon of interest is not 'categories' within a 'context' but 'categories-in-context'" (Hester, 1994; p. 230)[4].

In Hester's opinion (1994), categories are contextualized and contextualizing at the same time. The meaning of a category, whose understanding is a praxeological affair—that is, is worked out in the context of its use, is made up by the use of elements of context while the traits of context are enacted by the use of categories. The speakers' use of categories, the setting and the social context co-selected by speakers are the resources at speakers' (and analysts) disposal to understand 'categories-in-context'.

4.12.9 MCA in the face of social structure

Coulter (2001), Hester and Francis (2000), and Psathas (1999) work addresses the issue of the study of macro social phenomena such as states, governments, crowds, organizations, etc. through the study of talk and of members' categorization work. In particular, Coulter (2001) and Psathas (1999) show that the study of talk helps to undermine the dichotomy between micro- and macro- studies of social phenomena, while Hester and Francis (2000) address the methodological problem of how to proceed to study the recognizability of institutional activity.

Coulter (2001) asserts that ethnomethodology's focus on the understanding of society members' behavior is usually understood as the study of micro social phenomena and therefore opposed to other sociological forms of inquiry that instead engage in the study of macro social organizations such as the state, the church, the military system, etc. In his opinion this kind of conceptualization, that opposes different levels of analysis of social phenomena is misleading in the sense that studying the detail of talk gives access to understand how large-scale organizations are conceptualized. In fact, by studying how people use terms such as 'state', 'government' or 'church' in their ordinary conversations, it is possible to access how such entities are understood and what impact they have on social life.

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[4] My translation.

> "Almost all of the macro categories used by sociologists are ordinary-language concepts…consequently, inspecting the rules of use of these categories will illuminate the logic of their conceptualization" (Coulter, 2001).

In particular, people's conceptualization of macro phenomena can be understood by looking at how they relate the institutionally-relevant categorizations to the actions accomplished by people categorized that way.

> "When certain persons … say specific sorts of things according to specific rules (rules constituting also under what identification auspices their conduct is to be construed—e.g. 'Mayor', 'President', 'Pope' etc.), then these cases instantiate the conduct of macro phenomena" (Coulter, 2001; p. 42).

This means that collectivities and institutions lives "through the occasions that make relevant the instantiating membership categories" (Coulter, 2001; p. 44) and that a person can be heard to speak in the name of an institution, say a bank or a state, only when her conduct instantiates the conduct properly expected of a member of that institution and when there is coherence between the person's actions and the setting in which the activities are carried out. So, for example, if a person says they are the Pope and that they speak in name of the Church, they are recognized as such only if legitimately elected by the Conclave.

Psathas (1999), on the other hand, maintains that focusing on members' categorization work makes it possible to understand how the work of the organization is carried out in and through talk, and how the organizational context is progressively invoked and made relevant by the parties involved in order to accomplish the organizational work, since speakers are always oriented to each other' s identities. In doing so, Psathas recognizes that MCA's main contribution to understanding how the organizational context is accomplished resides in helping uncover how the identities of participants are manifested during their interactions. Psathas suggests studying how institutions are enacted in talk by looking at four interactional elements: the members' self-identification; the categorization that one party produces of the other/s as a consequence of the actions accomplished; the turn-generated categories; and the topic of talk.

As introduced above, Hester and Francis (2000) face the methodological problem of how to proceed to study the influence of context on talk by engaging in critical analysis of the methods adopted by the institutional talk program's scholars (Boden and Zimmerman, 1991; Drew and Heritage, 1992) to show the relationship between the organization of interactions and the order of institutions. In their opinion the institutional talk program, which seeks to demonstrate that institutional talk can be recognized by its having sequential structures that are systematically different from those of everyday ordinary talk in terms of the types of turn available and of the allocation of speaking rights, fails to demonstrate the institutionality of talk for two main reasons: it focuses on the sole sequential structure of talk, and it draws on the relevance constraint. In Hester and Francis (2000) opinion, there is no evidence that the use of the sole sequential analysis, which has been shown to be adequate for the study of everyday talk, is apt for the study of institutional talk. Moreover, they assert that the institutional talk program has failed to show that the identified sequential structures of talk are distinctive features of institutional settings. In addition, Hester and Francis maintain that institutional talk program scholars fail to show the institutionality of talk because they have applied Schegloff's (1991) relevancy constraint—which imposes that one must demonstrate that terms used to identify participants or to describe settings reflect the speakers' orientation to those elements in their talk—improperly. For example, they notice that Boden and Zimmerman's (1991) commitment to demonstrating the relevance of social structure at the level of talk in terms of talk-in-interaction enabling social structure is problematic in that,

> "In the absence of a clear explication of the connection between the 'enabling mechanism' formulation and the members' situated understandings, Boden and Zimmerman could be heard to attribute to ordinary members of society the special concerns of professional sociology, a practice which, according to Garfinkel (1956) is a defining methodological characteristic of conventional sociological theorizing" (Hester and Francis, 2000; p. 397).

Moreover institutional talk program's scholars fail to meet the relevancy constraint as they provide theory-driven analysis of data. In fact, in Hester and Francis' opinion they explain interactions with reference to concepts such as power, conflict and control

instead of simply analyzing talk and interactions for how they are produced and managed.

> "Drew and Heritage's reading of these (and other) data suggest that the institutional talk program's concern is not simply with analyzing the 'participant produced and managed' characteristics of talk between professional or bureaucrats and those with whom they deal, but also with interpreting such data with reference to generic features of such relations presupposed in mainstream theoretical accounts, features such as conflict, power, and control" (Hester and Francis, 2000; p. 401).

Even if reference to these concepts may lead to plausible data analysis, it is in no way possible to exclude that other interpretations of the observed phenomena are possible. For all these reasons, Hester and Francis suggest investigating how speakers make their discursive actions recognizable as institutional actions by expanding analytic attention beyond the study of the sequential structure of talk to include the "reflexive relationship between utterances, situated identities, and other circumstantial particulars". This means that institutional talk should be studied considering its sequential structure; its topical content, the used categorical identities and associated category-bound activities (Hester and Francis, 2000; p. 404) simultaneously.

> "The key point here is not that categorical identities should be allocated analytical precedence over other circumstantial particulars, but rather that the intelligibility and recognisability of any interactional activity is a situated accomplishment… [It is the] members' circumstantial orientations …[that] provide them with resources for seeing such occasions for what they commonsensically 'are'" (Hester and Francis, 2000; p. 405).

But above all, drawing on Garfinkel and Wieder's (1992) concept of unique adequacy of research, Hester and Francis claim it is necessary to construct the sociological inquiry from within "in the sense that the means by which inquiry is built are ones which the phenomenon itself makes available". Social inquiry must be tied to the phenomenon upon which it is premised (Hester and Francis, 2000; p. 409).

4.12.10 Validity and generalizability criteria in MCA

Moving away from the CA perspective, Peräkylä (2004) identifies the validity criteria that researchers should stick to when analyzing talk-in-interaction. In his opinion the

validity of research is guaranteed by the use of empirical materials as evidence for the researcher's claims, and by the adoption of specific strategies for research validation. These strategies include the transparency of analytic claims, validation through the next turn, analysis of the deviant case, relevancy of categorization, and procedural consequentiality of context. The transparency of the analytic claims refers to the fact that analysis is required to produce simple explanations that are transparently true in the sense that they can be easily detected in the analyzed extracts. Validation through the next turn consists of the opportunity for researchers to test their own interpretations of an expression by looking at how that expression is used by participants in subsequent turns of talk. Participants, in fact, always show each other their interpretation of prior turns of talk. The validation through the next turn thus permits researchers to understand the meaning attributed to words in situated interactions. The analysis of the deviant case consists of the researcher looking for deviations after having found regular patterns of interaction so as to test pre-formulated analytical hypothesis. The relevancy of categorization refers to Schegloff's (1991) formulation of the 'problem of relevancy'. Schegloff, in fact, maintains that researchers need to demonstrate that terms used to identify participants or to describe settings reflect the speakers' orientation to those elements in their talk. This helps avoid the analysts assuming certain features of interaction are relevant unless they can show that those features are "relevant to participants 'at the moment that whatever we are trying to produce an account for occurs'" (Schegloff, 1991; p. 50). The issue of procedural consequentiality instead refers to the need for researchers to show that the relevancy of a certain feature of talk is consequential for participants "in terms of its trajectory, content, character or organizational procedures" (Heritage, 2005; p. 111).

Moreover, Peräkylä (2004) highlights that the generalizability of research findings, given the limited data-base width on which CA studies are usually based, resides in considering the results of single case studies as "possibilities of language use" (p. 297)—that is, examples of practices that are possible in other settings. The results cannot be generalized as descriptions of what others do in similar situations, but they are generalizable as descriptions of what any person can do in similar situations.

MCA scholars use a similar conceptualization of generalizability and validity of MCA research. Similar to Peräkylä (2004), both Lepper (2000) and Benwell and Stokoe (2006) recognize that the issue of relevancy applies to MCA's validity like it does to CA. "MCA does not assume from the outset which identity categories will be relevant to any interaction" (Benwell and Stokoe, 2006; p. 66), but recognizes that researchers need to produce evidence that "the participants' production of the world is informed by [certain] categorization devices and that the parties [… orient to those] categorization devices in producing and understanding [… their own interactions] moment-by-moment". In addition Leppler (2000) recognizes that validity in MCA depends on validation by the next turn and by the deviant case analysis, as Peräkylä (2004) does for CA. Lepper (2000) also highlights researchers' need to ensure data inspection and that in the research report all the stages of the analytic process are made clear. Regarding generalizability, on the other hand, Lepper (2000) makes a distinction between 'distributional and sequential accountability'. Sequential accountability applies when sequential analysis is involved and analysis concentrates on one single strip of talk. In such cases generalizability of results is possible only by broadening the scope of the analysis, selecting fragments from other interactional sites. Distributed accountability, in contrast, refers to building up evidence across different sites or within the same site. Empirical materials therefore comprise several fragments of talk that can be analyzed, comparing how categories are distributed across different settings or how the same categories are used across different settings. In such cases generalizability is straightforward in that several interactional sites are under scrutiny.

4.13 To end up with MCA

MCA has so far been employed to analyze texts (Eglin and Hester, 2003; McHoul, 2007; Watson, 2009) and interactions that take place in different settings. MCA, in fact, has informed the analysis of mundane conversations (Butler and Weatherall, 2006; Hester and Hester, 2010), of conversations that occur in institutional settings (Hester and Francis, 1994; Hester, 2000; Lepper, 1995), of mediated talk (Hester and Fitzgerald,

1999; Housley, 2002), of intercultural interactions (Egbert, 2004), of interview data (Myers, 2006; Housley and Smith, 2011), and it has been used to study the relationship between discourse and identity (Stokoe, 2001, 2003, 2010) and to investigate political communication (Housley and Fitzgerald, 2003; Housley and Wahl-Jorgensen, 2008). As will be shown in Chapter 8, by focusing on planning work, this research fosters the need to link the study of speakers' use of categories to the execution of instructed actions.

4.14 Making the credibility, transferability, dependability, confirmability and ethics of the research process examinable

Given the ethnomethodological orientation of this ethnographic study, the objective of this research is to understand planning as a situated accomplishment. To understand how participants' activities and talk get problems in the allocation and re-allocation of stands and gates identified and solved locally, I carried out the data collection drawing on the following criteria:

- Interest in naturally occurring interactions more than in participants' descriptions of their actions;
- Interest in the "organization of work, its flow and the division of labor from the point of view of those involved in the work" (Randall et al., 2007; p. 132). This is possible because members' methods for making sense of reality are publicly available to observers;
- Interest in the operators' 'egological' viewpoint, that is, "the view of the world of work and its organization from the perspective of individuals cooperating and coordinating their activities with others" (Randall et al., 2007; p. 133)[5];
- Commitment to 'ethnomethodology's indifference'. This means that I limited my enquiry to investigating and understanding what was directly observable and/or

[5] Following an ethnomethodological definition of 'membership knowledge' the term 'emic' is not used, since it is most often conceived in terms of empathizing with, or imaginative immersion into, the subjects' experiences and intentions (on this point see: ten Have, 2002; p. 118 and Randall et al., 2007; p. 58). The concept 'egological viewpoint', instead, highlights the individual's working activities being part of a community and therefore leads researchers' attention to the division of labour and to how workers deal with it.

plausibly inferable from observation instead of drawing on prior theories as resources for understanding the participants' social work (Garfinkel and Sacks, 1970);

- Commitment to the requirement of 'unique adequacy' (Garfinkel and Wieder, 1992)—that is, the necessity for researchers to acquire a deep knowledge of the field under scrutiny. Since ethnomethodologists have interpreted the commitment to the principle of 'unique adequacy' in various ways, it is worth specifying that I followed Randall et al.'s (2007; p. 125-128) understanding of 'unique adequacy'. In their opinion the commitment to this requirement does not imply the researcher becoming able to work like the observed participants, given that the acquisition of a more than mundane competence suffices for the researcher to deliver an account of the observed activities that is intelligible to competent members;
- Commitment to 'ethnomethodological indifference' towards the reflexive analysis of my own orientations regarding the topic under scrutiny. As Randall et al. (2007) put it:

  "The emphasis in recent ethnographic writing on the 'reflexive' experience of the fieldworker, in that the fieldworker's history, attitudes, sexuality etc. impacts on their perception of the setting leads to the under-estimation of the extent to which the experience of those under study possesses traits of depth and stability" (Randall et al., 2007; p. 124).

- Commitment to producting a detailed (thick) description of how participants carry out what they think needs to be done. This is necessary in order to make examinable how the participants' 'vague descriptions' relate with 'tailored descriptions' of them that I provide (Crabtree, 2003; p. 73).

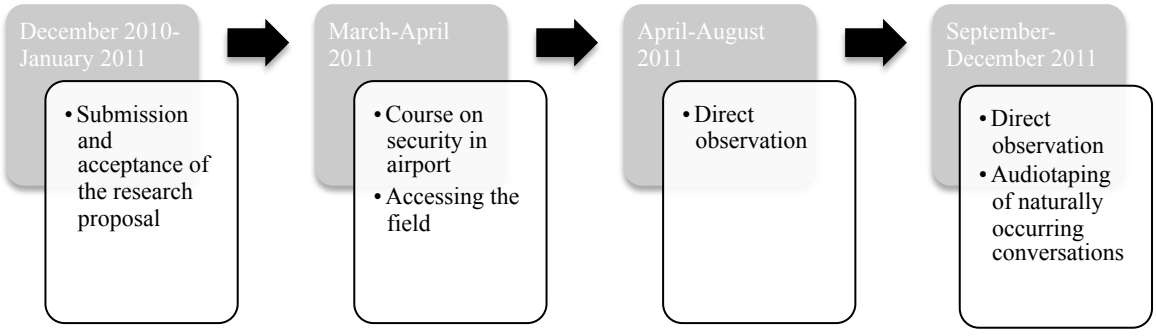
4.14.1 Timing of research

The empirical materials presented have been selected from among a corpus of data collected during an ethno-metodologically informed ethnography that lasted eight months at the ramp tower of an Italian airport. Data collection was carried out by spending at least two days a week in the service, observing the operators' activities for 5-6 hours a day for a total of over 500 hours. The operators were observed at different

times of the day and night according to the operators' shifts, to observe all the activities carried out by the operators and in particular to study how they carry out planning and re-planning. The length of the period of data collection was defined to cover the hourly, daily and seasonal variations of the service.

The first four months of the research involved collecting data by direct observation of the field. This way it was possible to familiarize myself with the bundle of activities carried out in the coordination centre and with the operators. During the following months direct observation was accompanied by audio recording of the naturally occurring conversations between the operators of the RCT.

Fig. 4.3: The timing of research



4.14.2 Getting uniquely adequate

As stated above, regarding the 'unique adequacy' requirement (Garfinkel and Wieder, 1992), the acquisition of participants' knowledge is necessary to access how they deploy it in contingent situations.

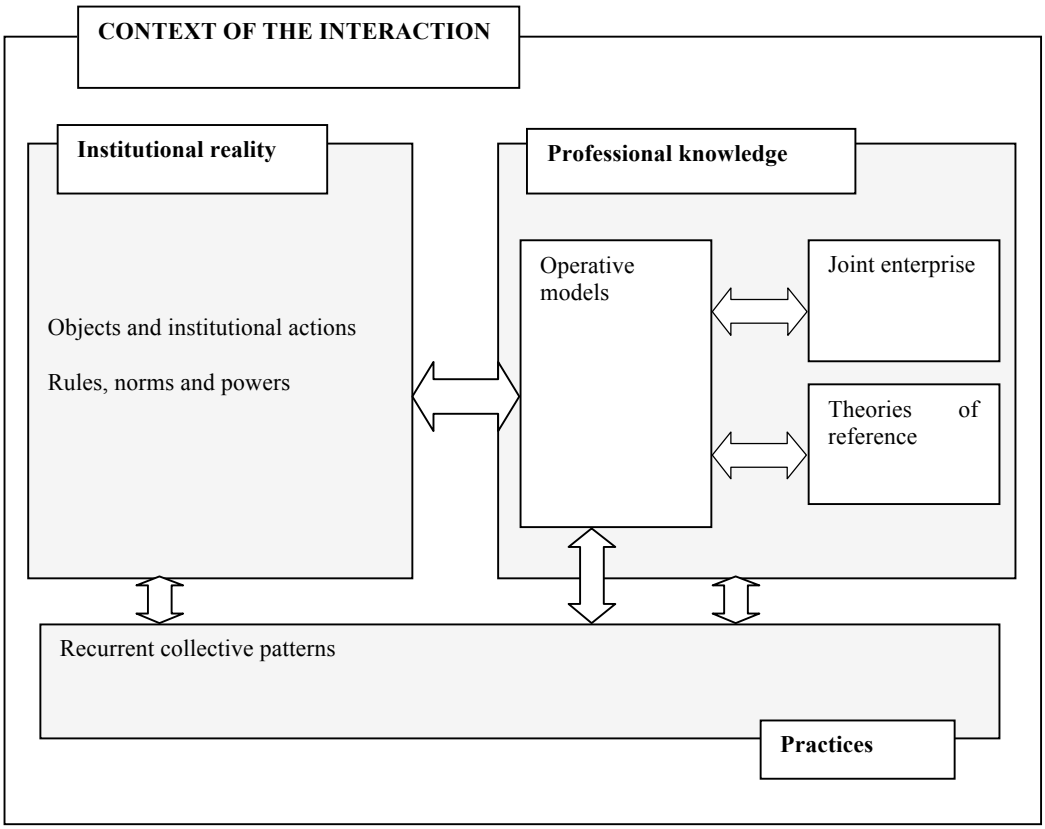
I got uniquely adequate to the setting by expanding my technical knowledge of the setting. I acquired technical knowledge on the organization of aviation by visiting the websites of the national and international agencies that control flight and airports functioning. This way I became acquainted with laws and regulations on civil aviation. I also examined books and papers on airport and flight functioning. I started expanding my knowledge on the observed airport during the course on airport security that I had to

attend to be authorized to access the field. The content of the course and the talk I had with participants (the airport personnel and managers) helped me select the relevant documents to read; introduced me to the terminology used by airport personnel, and helped me understand the kind of problems airport personnel have to deal with on a daily basis. Once I had entered the field, I was able to expand my knowledge on the functioning of the observed airport. Indeed I had the possibility to read operating instructions on the organization of the handling activities and to talk with the RCT operators and with the coordinator of the service, and therefore to understand how the airport space is organized, and to understand how the handling activities and the work activities within the apron tower are organized.

The ethnographic study, on the other hand, was necessary to understand the setting as the practitioners do. For this purpose I reflexively drew on ethnography and on the study of interactions to understand context as "socially constituted, interactively sustained and a time-bounded phenomenon" so that participants "attend to, construct and manipulate aspects of context as a constitutive feature of the activities they are engaged in" (Duranti and Goodwin, 1992; pp. 6-9). Practically, as suggested by Goodwin (2000; p. 1508-1509), I used "the visible orientation of participants as a spotlight" that shows the feature of context that it is necessary to know to adequately describe the organization of actions that make up the RCT operators' work and I focused on the key contextual features identified by Goodwin and Duranti (Duranti and Goodwin, 1992), namely the setting, the behavioral environment, and the extra-situational context simultaneously. The setting is the social and spatial framework within which the participants' interaction is situated. Atkinson and Hammersley (2007) assert that the material circumstances are of interest in that they funnel the actors' activities and in that their design embodies values and interests. Artifacts and the technical equipment need to be analyzed as well, as they might embody theories of knowledge or play an active part in shaping or developing knowledge. The social framework, on the other hand, is determined by the social attributes such as roles or social statuses to which participants show themselves to be oriented to. The behavioral environment comprises the participants' bodily movements and behavior, while the extra-situational context includes the elements that go beyond

the local talk and its immediate setting that participants bring into play when they interact. In order to engage in this endeavor, I audio-recorded naturally occurring conversation while keeping track of the operators' bodily orientation to each other and to artifacts, and of their use of the material features of context. The study of the operators' bodily movement was mainly oriented to understanding their access to the others' actions. Members' talk, instead, addressed understanding how it was used to create context for the development of the observed interactions. In this case the focus was on the participants' selection of contextual features by means of talk and on the operators' accounting work. I understood the extra-situational context of interactions by expanding my knowledge of the elements of the operators' interactions that I was not able to understand. In particular, I organized the study of the extra-situational context drawing on elements identified by Piccini, Carassa and Colombetti (Piccini, Carassa and Colombetti, 2006), that is, the institutional reality, the professional knowledge, and the work practices that are related to each other.

Fig. 4.4: Dimensions of the extra-situational context of interaction (adaptation from: Piccini, Carassa and Colombetti, 2006)



Institutional reality is made of the objects, events and actions that make possible the organization of a community engaged in the accomplishment of work. It comprises the rules, the organizational events such as meetings or audits; the actions, such as interviewing; and the roles that organize participants' incumbencies, duties, responsibilities, prerogatives, and powers. Professional knowledge is made of theories of reference, operative models and joint enterprise. The theories of reference are corpora of knowledge on a specific significant fragment of reality. This means that the term 'theories of reference' encompasses scientific theories but is not limited to them. Operative models refer to the documents that codify the procedures to execute to face different kind of situations. Operative models, even if inspired by theories of references, cannot be gathered from them in that they are set up on the basis of participants'

previous experiences and available resources. The joint enterprise refers to the objectives pursued by the observed community in the long term. Practices, on the other hand, are recurrent collective patterns that practitioners recognize as relevant for the execution of work. This relevancy can be reconstructed by investigating how participants relate such patterns to the objectives pursued by the community they belong to. In summary, the ethnographic study helped to catch the RCT operators' use of the knowledge that helps them master their work.

4.14.3 Accessing the field, observing and interviewing

Even though accessing the field can provoke observed subjects' resistance (on this topic see Atkinson and Hammersley 2007), I accessed the field quite easily. I entered the field of research after having gotten in touch with the chief of the human resources department of the biggest handling company that operates in the airport and which is responsible for the functioning of the RCT. I submitted a research proposal and, once I had authorization to begin researching, I had to attend a course on security that airport employees have to attend periodically. This way I obtained the visa I needed to access the RCT. After having signed a confidentiality agreement, I was allowed to access the RCT at any time of the day or night. It was more difficult to convince the RCT operators that I was not a spy of the management sent there to check on them, but spending time there, bringing with me academic things such as books and papers, and being really attentive to their work and interested in what they considered 'normal' activities, helped me to be accepted. I attended the RCT as a 'complete-observer'. The first day the chief of the human resource department of the company, who was my contact person, introduced me to the chief of the movement area that includes all the services necessary for the handling activities that have to be carried out, namely the operative service, the ramp, and the check-in service, and to the head coordinator of the 'operative area' who supervises RCT functioning. Then I was introduced to the RCT operators on duty that day, while I introduced myself and explained my objectives to all the other operators of the RCT day by day.

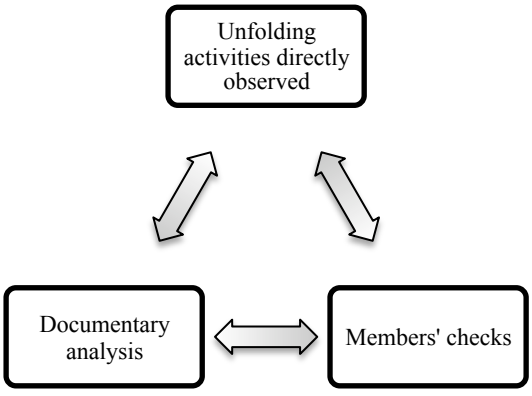
Because I only had a rough idea of the types of activities carried out in the RCT before accessing the field of research, due to restricted access to the service, I collected

observational data moving from a descriptive observation to a focused one. This means that at the beginning I tried to understand what the operators' work and its connection with the airport and flight functioning was, and then I focused my observation on their planning and re-planning practices.

Fig. 4.5: The process of observation

I studied the operators' work, drawing extensively on members' checks and on the analysis of documents produced inside and outside of the organization in a recursive manner. Following Cho and Trent (2006), I drew on technical and ongoing member checks. The former, in fact, consists of "the making sure that data collected are accurate in terms of a vis-a-vis agreement with participants", while the latter consists of the continuous members' check, rather than "a wholesale member's check at the end of the research report process" (Cho and Trent, 2006; pp. 328-332).

Fig. 4.6: The process of studying the setting



Among all the coordinative activities carried out by the RCT operators, I concentrated on their planning and re-planning practices. As such, I was not oriented to the mere identification of collective recurrent patterns of activities but to the identification of recurring patterns in the plan setup and change, as intersubjectively recognized by the RCT operators as embodying (or not) a certain practice. In that I followed Llewellyn and Spence' s (2009) conceiving practices as members' phenomenon.

I dedicated the majority of my time to observing the apron tower operators at work, taking notes, and collecting audio recordings of naturally occurring conversations, but I also spoke with the operators in order to understand what they were doing. Several ethnomethodologists prefer observation to interviews because they distinguish between first and second order observations (Lynch, 2002a), the first order data being those which emerge from participating in interactions, and the second order data the account of interactions. First and second order data are different in that accounts of previous actions do not show the details by and through which practices are accomplished. In any case, as Housley and Smith (2011) state, it is not necessary to banish interviews from EM-oriented research if researchers are aware of the limitations of interview data[6].

I interviewed the RCT operators, drawing on the ethnographic interview technique (Sherman Heyl, 2001; p. 369) that allows researchers to access "what people know the way that they know it". This means that I interviewed them repeatedly, establishing the operators as teachers and myself as a novice. At the beginning I interviewed the RCT operators while observing them carrying out their daily activities, and then I interviewed them during the setting up and changing of the stand and allocation plans. At the beginning the questions were devoted to understanding how the operators carry out their daily activities, and then more focused on how they realized there was a need to change the plans, how they reached a solution to re-allocation problems, and to the identifying the strategies they usually adopt for the plan setup. This way it was possible to integrate the information collected by observing the unfolding RCT activities and to get clarifications about information gathered in advance and about events that had just

[6] On this point also see: Rawls, 2005; p. 182-183 and ten Have, 2002; p. 75.

occurred. The interviews with RCT operators therefore were not structured in advance. The interviews were carried out at the workplace, making it possible to discuss the features and functions of artifacts. All the field notes and the interviews with the operators from the RCT were audio-recorded and transcribed, amounting to a total of 223 pages of notes.

I interviewed all the operators with the exception of one, who refused to be interviewed and audio-recorded over a total of 47 unstructured interviews. Drawing on interviews I progressively deepened my knowledge of RCT work and I was able to check the adequacy of my accounts of their work practices with participants. I also interviewed the chief of the human resources department of the company and the head coordinator of the 'operative area' three months after the beginning of data collection. In these cases I carried out semi-structured interviews with the aim of collecting information on the company, on the functioning of the operative area and on the vocational training of the RCT operators. It was not possible to record these interviews, so I noted down the topic developed during the talk. This way I expanded my background knowledge of the setting and was able to crosscheck the operators' accounts on these topics.

4.14.4 Documentary analysis

Ethnographers often focus on the written documents that inhabit the field of research during their studies. This attention is determined by the recognition that documentary materials are "data in their own right that enshrine a distinctively documentary version of social reality" (Atkinson and Coffey, 2004; p. 80). Documents therefore can be rich sources of information even though researchers need to be aware of the fact that they need to be analyzed critically. Documents, in fact, "are not literal accounts of 'what happened' but tokens of the facts the relevant personnel went about their business completely and reasonably" (Atkinson and Hammersley (2007; p. 131)[7].

This is why Atkinson and Coffey (2004) suggest looking at each document focusing on its genre and its intertextuality—that is, the kind of relationship it entails with other texts.

[7] See also Garfinkel's (1967) study of clinical records.

They also suggest critically analyzing documents by looking at the identity of the author/s of the document; at their authenticity; at their formal properties and rhetorical features; at the purpose they are produced for, and the identification of the addressee of the document.

For these reasons when I accessed the field of research I went through the operating instructions present within the RCT. This way it was possible for me to compare what documents foresee with how RCT operators enact them daily. This way I understood how RCT operators apply the rules about resource allocation to contingent requirements, how they recognize the application of formal procedures in accordance to the organizational requirements, and how they make their actions organizationally accountable. In addition reading these documents helped me gain information on how the service function and to crosscheck already acquired information. I also studied the written messages that the operators receive from other airports and airline companies during their daily work to get acquainted with the use of aeronautical abbreviations.

4.14.5 Recorded data

Given that this research project integrates information collected in field notes with that collected by audio recordings and their transcriptions, the reliability of recorded data must be dealt with. Discussing reliability in CA studies, Peräkylä (2004; p. 284) suggests basic strategies that can be properly applied to any study based on recording naturally occurring interactions to ensure reliability of recorded data. In his opinion, in order to ensure that the findings are independent of accidental circumstances occurring in the field, researchers dealing with recordings have to carefully evaluate the inclusiveness of recorded data, the 'database width', the technical quality of recordings and the adequacy of transcription. The inclusiveness of recorded data refers to the efforts that are made to avoid losing different aspects of social interactions, and it does require considering the kind of details that different forms of recording allow, and the access to the event scrutinized. So, for example, if the object of the study is a process which takes place over a long time span, recordings should cover all the stages of the process and not only some parts of it. In addition, when, in the setting under scrutiny, several activities are carried out simultaneously, then the whole wealth of interactions needs to be represented

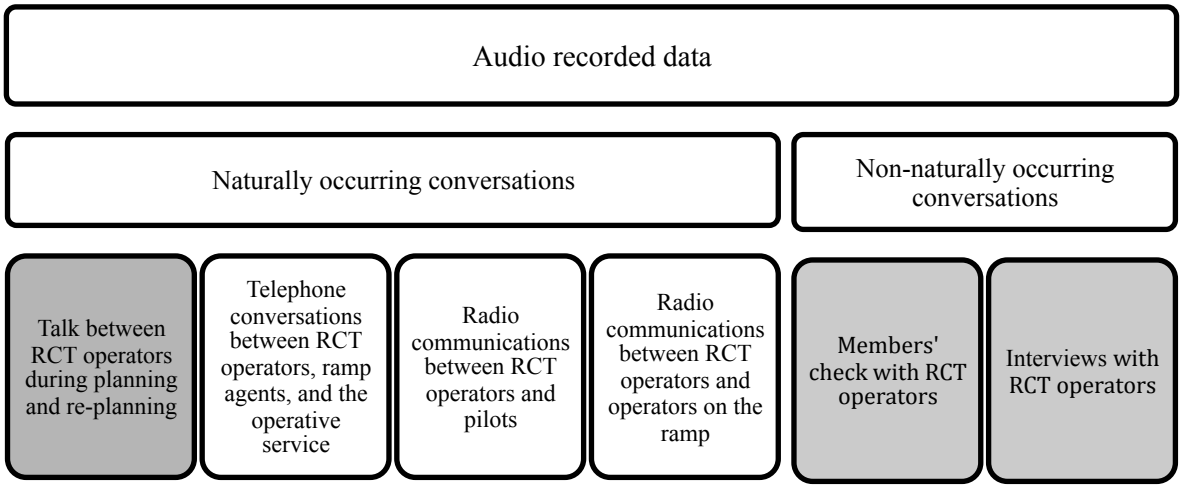
using several audio-recorders or video cameras, or a combination of the two, placed in different points in the setting. The 'database width' on the other hand refers to the need for researchers to collect a large amount of empirical materials to catch phenomena that appear rarely. The availability of a big database poses the problem of how to deal with them, since data transcription is a time-consuming activity. Peräkylä (2004) suggests that researchers can overcome this problem by examining the recordings repeatedly and then progressively selecting the data that is worth transcribing. The technical quality of recordings refers to the selection of high quality equipment and to the arrangement of the location of recorders and/or video cameras, while the adequacy of transcription refers to the justification of the choices made for data transcription. The transcription of the empirical materials, in fact, plays a key role in the analytic process, but it is also a selective process that reflects the researcher's theoretical goals and definitions (on this point see also Ochs, 1979). This is why researchers have to explain the criteria adopted for data transcription.

In the course of the current research process I was not allowed to videotape or take pictures of RCT's work due to security requirements. But since I was interested in keeping track of the temporal relation between RCT operators' talk activities, body posture, and the use of artifacts, because I consider talk and non-talk activities to be mutually contextualizing, I tried to compensate for these restrictions. Therefore, I took notes of the activities carried out by the operators during their talk and I made drawings to record the layout of tools and documents, even though I was aware that this would not make detailed analysis of the temporal relation between verbal and non-verbal actions possible.

After four months of presence in the field, I started audio-recording the operators' naturally occurring conversations. During this time I submitted an informed consent to the operators and I addressed all their doubts regarding being recorded. At the beginning, in fact, some operators interpreted my presence there as a way for management to check on them. Only one operator refused to be audio-recorded. Coherent with my research questions, I transcribed all the conversations occurring between the operators during

planning and re-planning, but not all those they had with pilots and with the operators on the ramp with whom they talk about the execution of ground activities.

Fig. 4.7: Description of the corpus of recordings: the grey boxes highlight the analyzed recordings



Following Nevile (2004; p. 21) I define as natural conversations that are recognized as occurring as if "I had not being there". Of course the operators did occasionally involve me in some conversations on topics not connected with their work, but I did not audiotape those conversations.

For confidentiality reasons, I changed names in the transcriptions to conceal the identity of operators. I also changed the identification codes of the flights; substituted the names of the airline companies with fictitious ones and changed the names of the quoted towns and airports.

I used one audio recorder. It was possible to have complete recordings of the RCT operators' talk occurring within the control room, and of their conversation via radio with the operators on the ground and with the pilots. It was not possible, on the other hand, to have complete recordings of telephone conversations between the RCT operators, the ramp agents, and the air traffic control operators with whom they share a dedicated

telephone line. The recordings keep track of the sounds in the room such as the telephones ringing, the operators typing, but also some external sounds such as the noise of the plane engines that sometimes made the RCT operators' talk inaudible.

I wanted to carry out a continuous audio recording since, as Nevile (2004; p. 26) notes, participants in high technology settings are continuously exposed to sounds or alarms that could have significant implications for them, but the operators asked me not to do that. For this reason I spaced out the audio recording following the pace of the operators' work. The corpus of naturally occurring conversation is therefore composed of several extended extracts of different operators' talk. This allowed the identification of recurrent patterns within the corpora to which the operators show themselves to be oriented to, and to look for deviations from identified regular patterns of interaction so as to test pre-formulated analytical hypothesis. The analysis of talk thus focuses neither on a single case nor on a collection of extracts coming from different corpora, as other researchers inspired by MCA have done (see Housley, 2002 and Housley and Smith, 2011)[8].

4.14.6 Transcribing participants' talk

Sacks and his colleagues (Sacks, Schegloff and Jefferson, 1974) recognize that conversations are made up of turns and that they are arranged in a sequential manner. Turns therefore can include single words or several sentences that are put together to do interactional work. Speakers, in fact, design turns to achieve social actions such as blaming, inviting, joking, and so on. In order to study how people achieve the actions through which social life is conducted, Sacks (1972a) introduces the use of audio recorders to collect data and the transcription of audio recordings of conversations. Recordings and transcriptions, in fact, make possible the preservation of speech exchanges and their repeated inspections. Starting from Sacks, coherent with the assumption that the order of interaction is in and emerges through the details of talk, CA scholars developed a specific modified orthography that displays 'sounds-as-uttered', instead of 'words-as-spoken' (ten

[8] As already explained (see par. 4.12.7) the 'single case studies' and the 'collection studies' are ways of proceedings that are possible within MCA. See Stokoe (2012) as an example of a 'collection study' and Hester and Hester (2010) as an example of a 'single case study'.

Have, 2004; p. 52). Researchers have become more and more interested in keeping track of the details of discursive interactions so that their organization and situated production can be investigated easily. The use of transcription conventions developed by Jefferson (2004), for example, makes possible the display of several features of talk such as prosodic features, overlapping talk, silence between and among utterances, tokens (for example 'okay' or 'ah'), and so on. These elements are of interest since they are not taken as signs of unsuccessful performances, but as relevant for speakers who are reciprocally oriented to them when producing their contributions and making sense of others. Yet, however detailed, transcriptions are only 'handy approximations' of recordings. They are "translations of the oral language used in the interactions, as heard and understood by the transcriber, into the written version of that language" (ten Have, 2004; p. 43). This implies that both tapes and transcripts "as-understood-by-the-researcher" are the data for the ethnomethodologically oriented study of talk (ten Have, 2002) and that scholars are called to explain the choices made during the data transcription in order to make clear the theoretical assumptions underlying their accounts of data (Ochs, 1979; p. 44). In recent years the availability of easy-to-use video recorders has led to the increasingly extensive use of video recordings to understand how participants coordinate non-talk activities, which include the participants' body orientation, gaze direction, body movements, posture, gestures, and so on, with talk and the use of material objects. Among others, workplace studies (Luff, Hindmarsh and Heath, 2000) scholars, who are interested in the study of practical action in situ within the multi-activity and socio-technical workplace, have drawn extensively on video recordings. Heath and Luff (1992), for example, have shown that operators within the control room of the underground line in London design their own conduct to make it publicly visible to inform colleagues about potentially problematic events thanks to the analysis of videotapes. The use of video recording in this type of research has emerged parallel with the recognition that in such settings talk is only one of the resources available to workers to share information or to make their contribution reciprocally meaningful. Similarly Goodwin (1995) has used videotapes to analyze the work of different scientists on an oceanographic research vessel and to explain seeing meaningful events as a socially situated activity (Goodwin, 1994). The use of video

recorders has led to the definition of new ways of transcribing talk. The transcription of talk activities, in fact, has started being accompanied by the recording of non-talk activities that occur during talk. To date non-verbal activities have been represented in different ways. Goodwin (1981), for example, uses symbols; Jordan (1992) uses short descriptions of non-verbal actions; Goodwin and Goodwin (1996) and Goodwin (2000) use drawings, while Heath and Luff (1992) and Heath, Luff and Svensson (2002) use video stills[9]. Similar to CA scholars, MCA scholar transcribe real talk, organizing it in turns by means of a modified orthography though this is not always the case. In Jayyusi (1984) and Drew' s (1978) work, for example, transcripts are created using the standard orthography. More recently Stokoe (2012) introduced the use of transcriptions of talk plus video stills to carry out MCA-informed research.

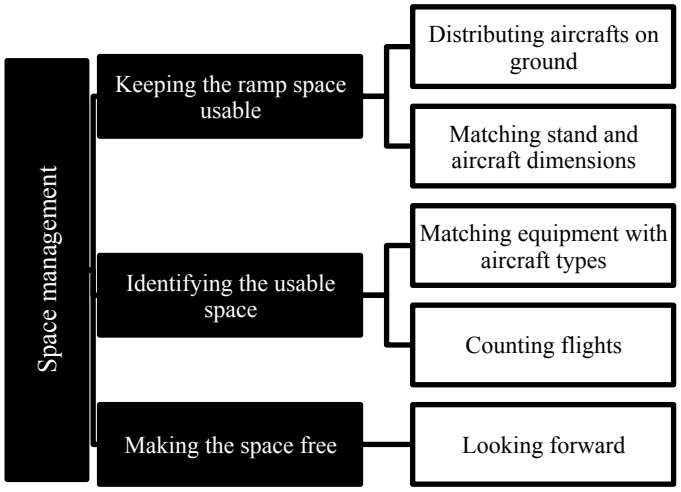
The audio recordings collected over the course of this research project have been transcribed to make their analysis possible. I transcribed the operators' conversations drawing on a modified orthography (see transcription conventions) that allowed me to keep track of the 'sounds as uttered' to catch the operators' inferential work that emerges from their lexical choices and the way words and utterances are produced. Yet, I decided to use the standard numeric symbols for the representation of numbers, to separate them with punctuation, and to use symbols to trace the referents of numbers to make the reading of transcripts easier. The RCT operators, in fact, usually quote an incredible amount of numbers that refer to the identification numbers of parking areas, gates, flights, and time, without explaining their referents. Transcripts of conversations are presented following Jordan's (1992) example —that is, accompanying the transcripts of talk with short descriptions of non-verbal actions for a total of 197 transcript pages. The fragments of interviews reported in the research report, on the other hand, have been transcribed using the standard orthography. In the report it is always explained whether a fragment is part of an interview or of a naturally occurring conversation.

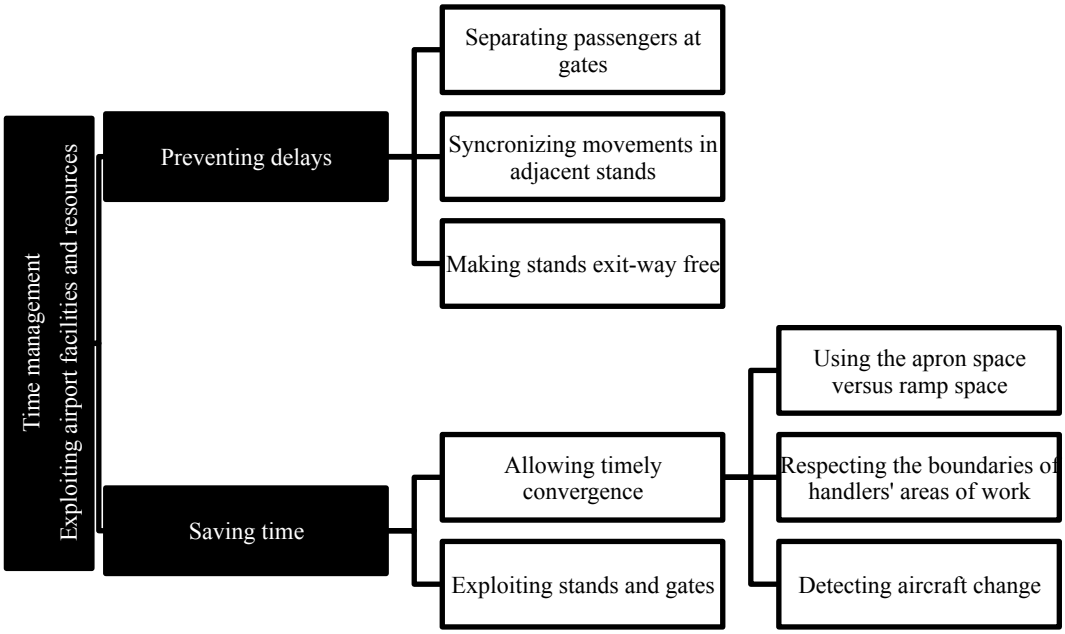
[9] For a comprehensive review of the theoretical and practical issues of transcribing communication data see Jenks, 2011.

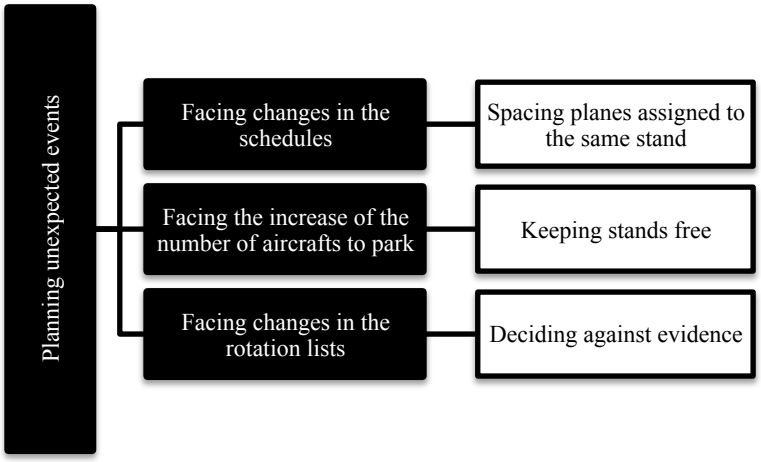
4.14.7 The process of data analysis

Once I had identified the RCT operators' planning and re-planning practices, I organized them in three taxonomies that comprise both discursive and non-discursive practices, following what I understood to be the operators' main concerns during planning: practices for space management, for time management and for the management of unexpected events as the figure below shows.

Fig. 4.8: Preliminary data analysis







Drawing on this preliminary data analysis and on the discussions I had with my supervisor, I tried to find a concept to use as an illuminating device to explain the RCT operators' planning and re-planning work. While comparing data with the results of previous research I noticed that plans are mainly conceived as instructions whose content needs to be made out by reading them in light of the local circumstances of their use, but I also noted that, by explaining the operators' planning work in a that way, I would not

have given a proper account of their planning work. In fact, I would not have been able to explain the operators' efforts to design and change plans according to local work circumstances, but also according to their views of what good plans, which is determined but not limited to institutional requirements, which I noticed had an impact on their planning and re-planning choices. For example, the operators set up plans resistant to unexpected events even though any RCT's document dictates this. For this reason I tentatively confronted the concept of 'instructed action' (Garfinkel (2002), which stresses the triadic relationship between instructions, material conditions and projected outcomes with data. This way I succeed in giving an account of the RCT operators' planning work, which has allowed me to challenge some understandings of plans and planning put forward by the literature: namely that plans cannot support temporal coordination and that plans cannot be used to deal with the unexpected and to explain the kind of support that software design should provide to this type of planning activity. Moreover, inspired by the concept of 'instructed action', I was able to approach the understanding of the capability of plans to anticipate events as a situated accomplishment, and to find evidence of that in the collected data. In addition, I was able to deal with the understanding of how plans can be changed while remaining recognizable as working tools.

4.14.8 Generalizability of data

Research generalizability draws on the 'thick description' of the observed work practices, which makes it possible to compare the results of data analysis to unknown situations. In fact, as Johansson (2003) states, results can be generalized when, thanks to the acuity of data interpretation and the detailed description of the field, comparison between known and still-to-know cases can be made. Johansson states that this kind of generalization is based on 'abduction'.

> Generalization based on abduction is operative when "generalizations are made from known cases to an actual problem situation by making appropriate comparison" (Johansson, 2003; p.10).

To conclude, it is worth noting that, since during the collection of the empirical materials nothing went seriously wrong—that is, there was no major accident that led to the

disruption of the service—the corpus of data analyzed here allows only for the analysis of activities that occur within the RCT routinely.

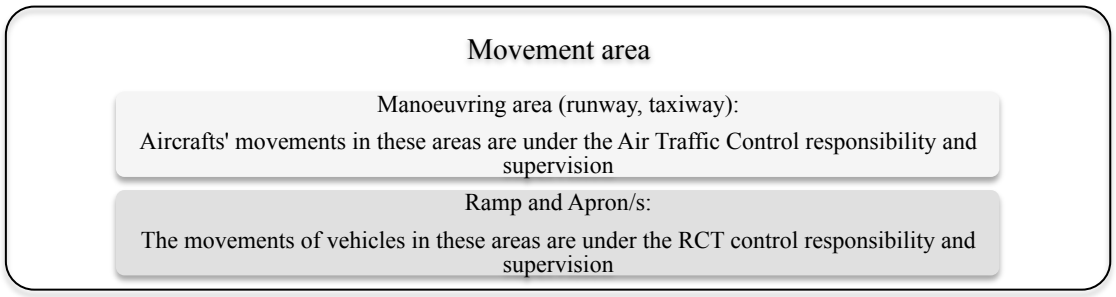
4.15 The setting

Empirical materials were collected in an Italian airport. The observed airport has a simple structure (i.e., one runway and one terminal building) and is small, but it is the third most active Italian airport for cargo air transport movement and the fourth largest in terms of the number of annual passengers, which has progressively increased from about 3 million in 2003 to 7.5 million in 2010, which corresponds to the growth of low-cost airlines. The airport is home to a mix of low-cost, charter, cargo, and private flights, although low-cost companies represent the majority of the airline companies operating in the airport.

The airport space of the observed airport, similar to what happens in all airports, is divided between the airside and landside areas. The landside area includes the access roads, public transportation means, and parking lots, while the airside area includes all the areas accessible to planes. The terminal building is between these areas and provides check-in, boarding and disembarkation services, commercial outlets, security and passenger assistance services, and has a cargo service area. The airside area, on the other hand, includes the runway, the taxiway, the ramp, and the apron. The ramp is the area next to the terminal building, while the apron is the area far from the terminal building. The ramp is the space where the handling activities take place while the apron is the space usually used to park aircraft that need maintenance or that stay on ground for days. This is due to the proximity of the ramp space to the terminal, which makes it easier to execute handling than using the apron. Both the apron and ramp spaces are divided into stands that are the parking areas for aircraft. These areas are determined by the airport engineering service on the basis of airport structure, and the number and typology of flights to host. In the observed airport the responsibility of supervising planes'

movements within the airside area is divided between the air traffic and ramp control tower, as the image below shows.

Fig. 4.9: Supervisors of the airside area movements



The observed airport is owned by the state, which has leased the airport to a private company for the maintenance of airport facilities. Three handling companies settled in different areas of the airport provide handling services. The same company responsible for airport maintenance manages one of these handling companies and runs the RCT. Employees of the national authority for air traffic control man the air traffic control service, which is located in a dedicated tower.

4.15.1 The handling activities in short

The handling activities are all the activities that are necessary for aircraft and passenger assistance on the ground. In turn, both passenger and aircraft assistance include several activities carried out by several operators in collaboration with air traffic control for aircraft movement and with the check-in services for passenger and luggage check-in.

Fig. 4.10: Aircraft assistance

ACTIVITY	OPERATORS INVOLVED
Aircraft fuelling	Drivers of fuelling trucks (specialized personnel)
Aircraft catering	Truck drivers (specialized personnel) Utility workers
Aircraft cleaning	Utility workers
Assisting aircraft movement on the ramp	Marshaller (specialized personnel) Drivers of follow-me cars (specialized personnel) Drivers of pushback tractors (specialized personnel) Ramp agent (specialized personnel)
Coordinating the turn-around activities	Ramp agent (specialized personnel)
Steps provision	Drivers of trucks towing steps for aircraft (specialized personnel)

Fig. 4.11: Passengers' assistance

ACTIVITY	OPERATORS INVOLVED
Passenger and luggage check-in	Check-in operators (specialized personnel)
Coordinating passenger movement on the ramp during boarding and disembarkation	Ramp agent (specialized personnel)
Luggage loading and unloading	Utility workers
Passenger movement on the ramp	Bus drivers (specialized personnel)

Each airline company defines the duration of turn-around time—that is, of the time necessary to make an aircraft ready to depart—, so the length of these times varies widely. The handler companies have to get ready to ensure that the handling activities are carried out respecting turn-around time. The work of all the personnel involved in ground handling is organized by chiefs in charge who assign shifts and workload to workers on the basis of the scheduled flight lists and of the stand and gate allocation plans.

4.15.1 The RCT

This research project focused on the study of the ramp control tower (RCT), which is the coordination center (Suchman 1997) that is active 24 hours a day for handling activities on the ground. The RCT operators are responsible for coordinating the handling of planes on the ground. They achieve this goal both by communicating with all the stakeholders involved in the aircraft and passenger assistance and by planning the use of gates and stands. The RCT operators communicate with the ramp personnel, crews, and

air traffic control operators to instruct crews about where to stop and ramp personnel about where to converge in order to handle each plane properly. At the same time the RCT operators update the flight database with the arrival and departure times as the figures below show.

Fig. 4.12: RCT operators' routine coordinating assistance to incoming aircraft

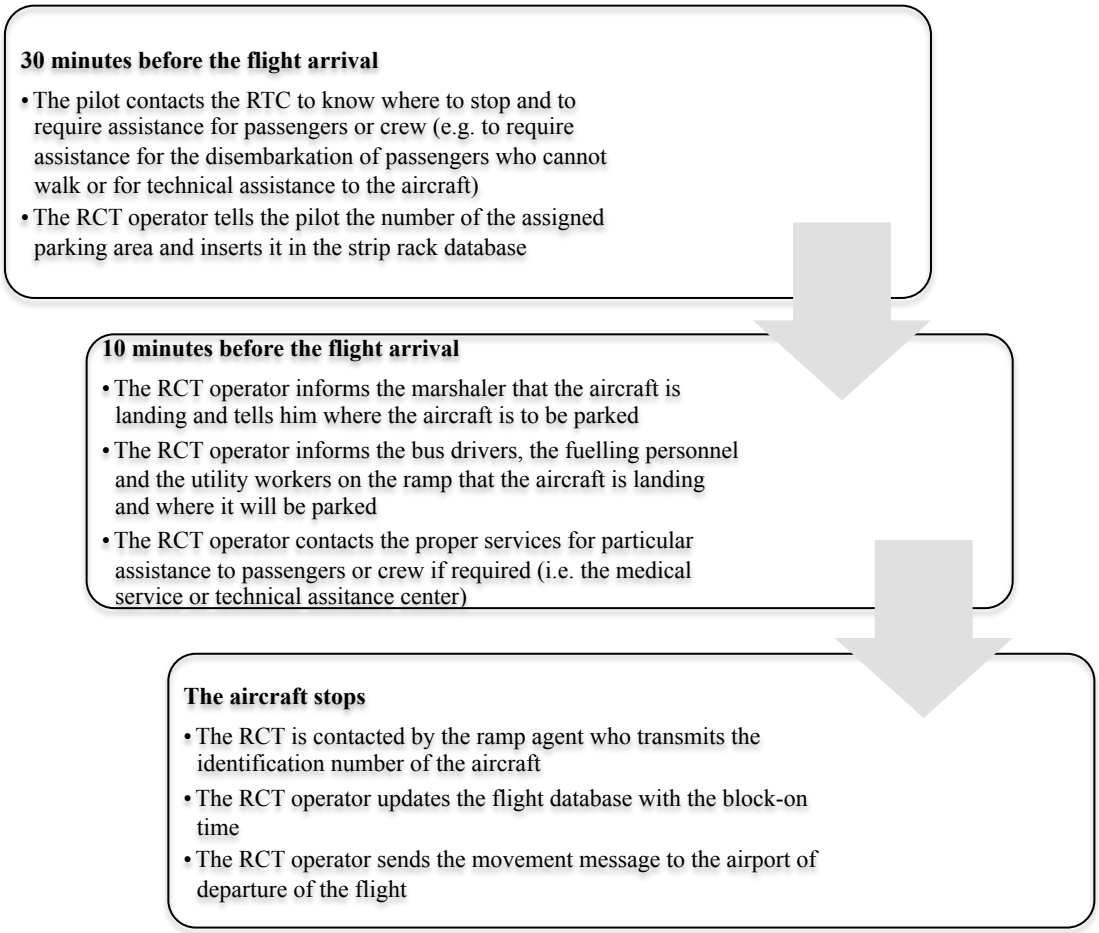
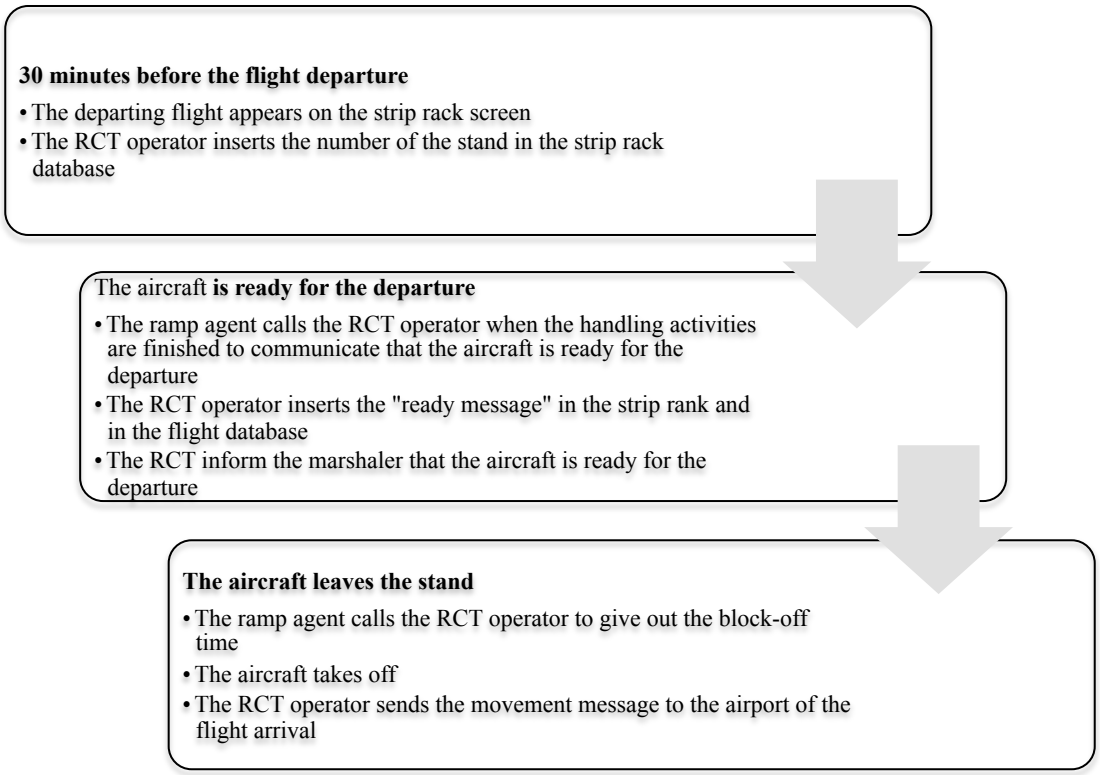
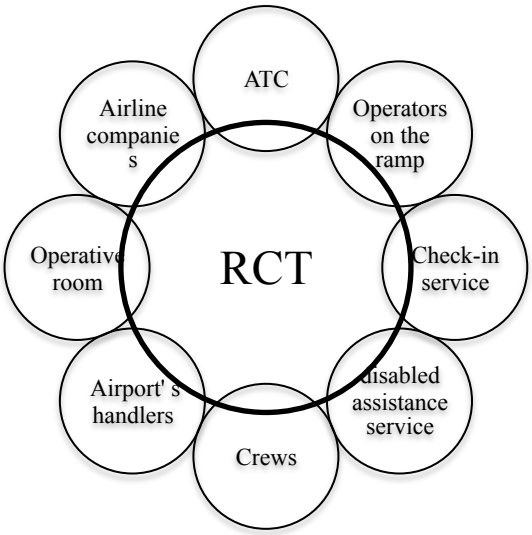


Fig. 4.13: RCT operators' routine coordinating the assistance to departing aircraft



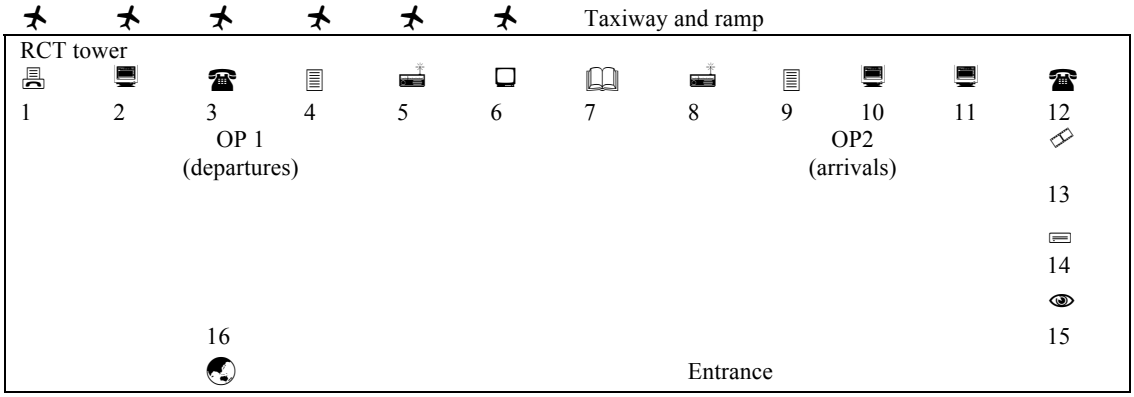
Thus the RCT operators are in touch with several airport services, such as the operative room, which coordinates ramp agents and co-operates with the RCT in updating the flight database, air traffic control, the other handler companies settled in the airport but also with crews and airline companies (see image below).

Fig. 4.14: RCT interlocutors



The RCT operators work in an environment full of artifacts. As the image below shows, the operators have two workspaces at their disposal for setting up and changing the gate and stand allocation plans and for coordinating all the ground activities connected with the departure and arrival of planes. The operators sit at their workstations where one of them manages incoming flights, while the other manages departures. Some tools are available to both operators, while others are not. Big windows in front of the operators' workspaces provide the direct view of most of the ramp and taxiway.

Fig. 4.15: Layout of the RCT



LEGEND

Operator 1 workspace
1 Telex
2 Computer

3 Telephone
4 Stand and gate allocation plan of departing flights (paper version)

5 Radio

Shared tools
6 Strip rack
7 Notebooks
14 Printer

Operator 2 workspace
8 Radio
9 Stand and gate allocation plan of incoming flights (paper version)
10 Gate allocation plan (electronic version)
11 Computer

12 Telephone
13 Closed circuit camera

15 Binoculars
16 Airport map

The RCT uses a closed-circuit system and binoculars for surveillance of the parking areas, a monitor showing the electronic strip-rack, and software for the allocation of stands and gates. The electronic strip rack offers various pieces of information on flights, such as the estimated block-off time (EOTB) and the calculated take-off time (CTOT) for departing flights, which allows the operator to know at what time the flight is scheduled to depart and at what time the plane will actually depart. The strip rack also provides information about flight status for incoming planes. These statuses change from inactive to active, radar, and landed, corresponding to the plane's approach to the airport. The strip-rack also provides different evaluations of the estimated time of arrival (ETA) so that the closer the plane is to the airport, the more accurate and reliable the estimations of the arrival time are.

Fig. 4.16: Simplification of the layout of the strip rack for incoming and departing flights

FLIGHT	PRKG	ETA	ST_RDR	ATA	BLOCK	8 MILES	4 MILES	THRESHOLD	SV
NAC54	13	12.00	12.02	12.01	12.06	11.56	11.58	12.01	BLOCKED
NCS28	…								
…									

LEGEND
FLIGHT: Flight number
PRKG: Stand number

8 and 4 MILES: the aircraft is approaching the airport
SV: status of the flight
INACTIVE: the flight has not been detected by the radar yet
ACTIVE: the radar has detected the aircraft
FINAL: the aircraft is going to land
LANDED: the aircraft has landed
BLOCKED: the aircraft has stopped in the stand

ETA: Estimated time of arrival
ST_RDR: Radar estimated arrival time
ATA: Actual time of arrival

FDP	FLIGHT	PRKG	EOTB	ATD	SV
11.00	BCT88	10	10.55	11.02	TAKE-OFF
…					

LEGEND
FDP: Flight departure plan
FLIGHT: Flight number
PRCK: Stand number

EOTB: estimated block-off time
ATD: Actual time of departure
SV: status of the flight
INACTIVE: the aircraft is not ready for departure
READY: the aircraft is ready to switch on engines
DCL: aircraft cleared for departure
R_DCL: aircraft ready for take off
TAKE-OFF: the aircraft has taken off

RCT operators use phones and radios to keep in touch with all the operators on the ramp (ramp agents, bus drivers, marshallers, follow-me truck drivers) and with the operative room. Beside the strip rack, a dedicated telephone line is used to communicate with the ATC tower. Telex and e-mail messages are used to share information with airline companies and with the operation room. RCT also uses a notebook that lists the messages that refer to daily occurrences, such as ongoing maintenance procedures at gates, stands and aircraft; particular messages received by airline companies; to-do lists (i.e. messages to send or to receive) that the RCT operators progressively update. The

operators might also consult operative instructions that help them to plan the use of stands but also to deal with extreme weather conditions such as fog, snow or storms; there are documents glued on furniture that summarize the types of gates and stands whose allocation needs to be coupled; security protocols; a big map of the airport on the wall that provides information on the technical features of stands. The software supports the allocation of stands and gates. It represents stands in a Gantt chart that enables the visualization of stand allocation over time. The software allows for the automatic allocation of stands even though the RCT operators use it to aid in the manual allocation of stands, exploiting the fact that the software highlights conflicts during stand allocation. By dragging and dropping flight numbers on the chart, icons that represent the length of planes' stays on the ground appear, while a color code system alerts operators whenever conflicts in stand allocation emerge. For example, the alarm color code signals mismatches between the size of the stand and the size of the plane.

Fig. 4.17: Simplified representation of the layout of the stand allocation planner

		Time					
Rotation lists		1	2	3	4	5	6
FR3456/3458	Stand number 1						
FR8765/8766	2						
AZ6754/6755	3						
…	4						
…	…						

LEGEND
Red line: The stand is out of order
Green line: Proper stand allocation
Olive-green line: Open rotation: only the arrival time is available
Pink line: Improper stand allocation: the interval between stops is shorter than the minimum required or the size of the aircraft is not compatible with the size of the stand, or aircraft allocated to adjacent stands are not compatible because of the size of one or both.

The software also supports the allocation of gates. It neither provides an alarm code nor automatic gate allocation, but it enables an overview of the gate allocations and allows operators to monitor the number of passengers boarded for each flight. As a result, the operators must pay attention to overlaps or mismatches in the use of gates. The data on the scheduled flights included in the system for the gate and stand allocation need to be manually updated when changes in the scheduled time or the numbers of planes occur. These updates are carried out both by the operative service and RCT operators. Once set up, both the stand and gate allocation plans are printed in documents that divide the allocation of stand and gates between incoming and departing flights.

The software is used to exchange emails and telex with other airports and airline companies. In addition, the flight database is linked with the airport website and it transmits information to the screens in the airport. So, for example, when the RCT operators insert 'block-on time' in the database, the message 'landed' appears next to the flight number on the screens all over the airport and on the website.

4.15.2 Planning stand and gate allocation

The RCT operators are responsible for the setup of the gate and stand allocation plans. Indeed, operators have to plan the use of gates and parking areas for aircraft to ensure that each plane finds its proper stand upon arrival, that the stand will be available for the duration of the plane's stop on the ground, and that a proper area will be available for the execution of boarding procedures. To this end, RCT operators plan the use of stands twice a day. By night the operator on duty plans the stand and gate allocation from the early hours of the next day until the afternoon, while another operator plans the use of the parking areas and gates for the rest of the day. In addition, the operators monitor whether these planned solutions remain useful despite last-minute changes in the number and/or timetable of scheduled flights, and modify the plans as necessary.

The stand allocation plan can be set up when the operators know the exact number of planes that need to be parked, their dimensions, their arrival and landing time, and how long they will stay on the ground. RCT operators receive this information at different times. Passenger and cargo airline companies send scheduled flight lists biannually, and

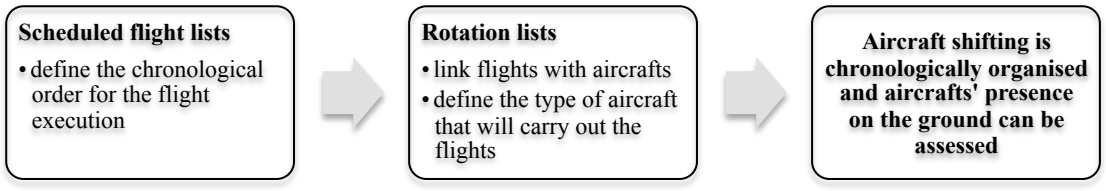
updates of the schedule plan on a daily basis or even twice a day. Similarly, RCT operators receive the list of the general aviation flights—that is, the list of the private and commercial flights other than the scheduled flights—, on a daily basis. In addition, RCT operators receive rotation lists twice daily from cargo and passenger airlines. The rotation lists are documents in which each airline company matches aircraft with the flights to be carried out the next day.

Fig. 4.18: Simplified layout of a rotation list

Aircraft registration number	Flight numbers
EIRMA	FT3452, FT7865, FT9856, FT9231, …
EIEPO	FT4563, FT7645, FT3445, …
…	…

Each aircraft is usually used for several flights during the day and very often the flights are carried out consecutively. So, after the arrival and the completion of the turn-around activities the aircraft is due to execute a new flight. In this case the aircraft stays on the ground for the time required for turn-around activities. Schedules and rotation lists enable RCT operators to determine the number of planes to be parked and how flights are assigned to planes, thus enabling the assessment of how long each plane will stay on the ground (see Figure 4.19).

Figure 4.19: Matching schedules with rotation lists



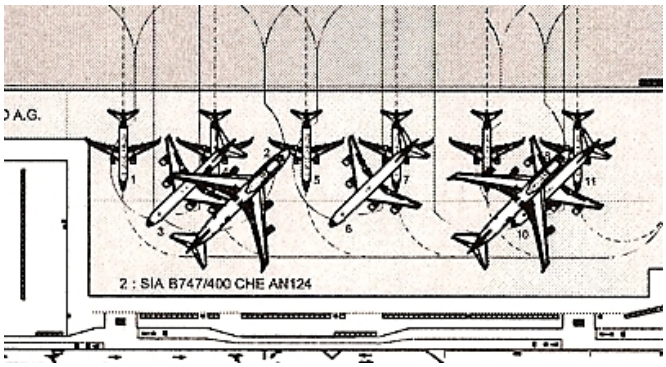
For the stand allocation plan to be set up, the RCT operators have to consider the number of stands and gates at their disposal as well as the stands' technical features. Stands' features allow them to be exploited in different ways, so that possibilities and constraints in their use emerge as a consequence of planning itself. Stands are delineated according to their maximum capacity (which, in turn, is defined on the basis of the length of the fuselage and the wingspan of the biggest aircraft that can be parked there), the maneuvers allowed to reach and leave them, and the number of parking areas that cannot be used simultaneously (see Figure 4.20).

Figure 4.20: Technical features of stands

Stand number	1	2	3
Capacity	Up to B757	Up to B747	Up to B737
Maneuvers	Push back	Self-maneuvering	Push back Self-maneuvering
Inhibitions	2 3 4	1 3 4	2 4 5

Parking areas for aircraft have different dimensions to appropriately accommodate the various planes, the sizes of which vary considerably. Each stand can accommodate different types of aircraft as they can be used to park planes whose size does not exceed the maximum capacity of the stand. It is important to understand the maneuvers required for each type of plane to leave the stand as different types of aircraft' maneuvering require a different amount of space when moving into and out of the stand. Stands might also have overlapping exits with adjacent stands, so their use might be limited during the planes' maneuvering (see the figure below).

Fig. 4.21: Fragment of the map of stands of the observed airport



RCT operators plan the use of stands considering safety requirements as well. In fact, they plan stand use calculating an interval of at least 15 minutes between aircraft allocated to the same stand.

Like stands, not all gates are equal. Gates, which have different features, can be directly connected with stands by means of fixed jet bridges (structures the RCT operators call 'fingers'); thus, the use of stands and gates has to match. In other words, once a stand is assigned to a certain flight, the boarding procedures of that flight have to take place at the gate structurally linked to that stand. In addition, while some stands allow for passengers to board on foot, others do not, meaning that buses have to be provided for the latter. This implies that the RCT operators have to match flights with gates while respecting the number of passengers to board but also the security requirements that might involve boarding by bus for certain flights. Thus, the way stands and gates might be used depends on choices made when planning.

RCT operators plan the use of stands and gates while considering scheduled flight times. In fact, they set up the stand allocation plan based on the premise that flights will be carried out according to the schedule, working sequentially on the plan set up.

The plan setup is organized in stages of necessity in the sense that operators access the necessary information at different times of the day. As a result, stand allocation plan setup can be defined as a distributed activity, as the plan is the result of layers of

decisions made by several actors in due time while managing several other activities. The operators ensure the continuity of planning over time by both planning in advance and 'planning on the hoof' whenever necessary. The operators' advance planning consists of planning before the plan is executed. The operators' re-planning occurs during the plan's execution and is devoted to compensating for changes in the execution of flights or in the rotation lists. Flight delays or arrivals ahead of time as well as flight cancellations or the addition of charter flights are the most frequent causes of changes to plans. Therefore, planning, which is carried out individually, and re-planning, which is accomplished by the operators on shift dialogically, intersect with one another over the course of the day and planners and plan executors follow one another. It is also worth considering that, during the last ten years, the airport has ensured a progressive increase in air transport movements and that low-cost companies provide the majority of flights hosted by the airport. As a result, the operators have to handle aircraft on the ground while respecting short turnaround times, all the while ensuring stand availability for planes that stay on the ground for several hours or days. Aircraft used to carry out scheduled flights, in fact, stop all night long on ground while cargo flights stop on the ground in the morning. In addition, planes might stop on the ground for a few days when technical assistance is required.

RCT planning activities not only play a key role in ensuring the orderly movement of planes on the ground, but also ensure the orderly execution of flights because they support the timely execution of assistance to planes on the ground, which is crucial for executing flights as scheduled. In particular, the stand and allocation plan work as coordination mechanisms (Schmidt and Simone, 1996) because they permit the convergence of personnel involved in assisting the plane on the ground (bus, fuelling, and tow truck drivers; ramp agents; utility workers for aircraft cleaning and luggage loading and unloading; drivers of follow-me trucks and of belt-loader vehicles) upon the planes' arrival and the convergence of airport personnel and passengers at the gates.

5. Temporality in planning

Setting up plans that support the temporal coordination of the distributed and interrelated airport activities connected with aircraft handling is one of the main concerns of the RCT operators. This is why this chapter shows the RCT operators' planning practices making plans suitable for ensuring the temporal coordination of work. By doing this, this chapter challenges research on plans that shows them as unable to define deadlines accurately or in a credible or consistent way, so that plan executors need to make special efforts to meet these deadlines. Focusing on planning as an instructed action, that is, looking at the methods used by planners to enact, and to make recognizable as such, projected planning outcomes by means of competent use of planning instructions, helps us understand how plans can be set up to minimize the work executors of plans have to do to meet deadlines. Moreover, this chapter, going into the RCT operators' planning practices by analyzing the operators' knowledge of the temporal features of planning, contributes to understanding the role of temporality in planning. In fact, when planning is a cyclical activity, specific articulation problems over time need to be addressed. The chapter thus contributes to understanding how timely assistance for aircraft on the ground depends on how spaces are allocated, and promotes the understanding of the features of allocation as situated and distributed activity.

5.1 Introduction

Recent research has identified several features of plans and planning, as well as plan failures in the organization of the temporal order of work activities; however, investigations into how people's experience with the workplace setting's temporal structure might impact the use or setup of plans are lacking. This chapter aims to address this issue by studying how the RCT operators plan the allocation of parking bays for planes. This setting offers the possibility to observe situations and behavior that embody

the topic under study in a perspicuous way (Garfinkel, 2002; p. 182). It is likely that understanding temporality in planning could foster our understanding of not only the procedures for establishing plans, but also of how plans can be set up to minimize the efforts of plan executors to meet deadlines and ultimately of plans as temporal coordination devices. The analysis of temporality in planning advanced here draws on the practice-based perspective of time to contribute to understanding planning as a socially constructed activity (Bardram, 1997).

In order to develop this argument, the chapter first presents existing studies that have focused on planning and temporal coordination. It then introduces information about planning in the ramp control tower (RCT) and discusses the temporal features of this activity. Finally, it deals with the question of how to incorporate temporality into the design of software to ensure successful support for work coordination.

5.2 Debating plans in the CSCW community

As explained in Chapter 3, the debate on plans in the CSCW community first emerged in the 1980s in response to Suchman's (1987) work criticizing the possibility of plans causally determining actions, as claimed by cognitivist theorists. Suchman demonstrated that actors' actions cannot be conceived as being determined by plans stored in memory in the form of formulated prepositions as actions are never planned in the causal sense, but rather always situated in the circumstances of the specific context. In addition, Suchman's characterization of plans as weak resources for controlling actions affected subsequent study of the role of plans in work organizations. Schmidt (1999) argued that the development of the 'situated action' concept increased scholars' interest in understanding situated actions, albeit to the detriment of the analysis of plans as 'guidance for work'. Suchman's work has also often been perceived as introducing a sort of opposition between plans and situated actions, presenting plans as poor resources that limit human actions, which, as a result, cannot give an account of all the occurrences of situated actions.

Starting in the 1990s, several scholars began criticizing some of Suchman's developments (Ciborra, 2002; Schmidt, 2011b; Vera and Simon, 1993). For example, Schmidt (2011b) disentangled some of the conceptual confusion about the presumed 'weakness' and 'incompleteness' of plans, while Bardram (1997; p. 24) demonstrated the situated nature of planning showing that the strength of plans is in the "anticipation of future ways of performing activities, detached from—but still taking into account—the conditions of real-world settings".

5.3 Situated use of plans

According to Rönkkö et al. (2005), empirical research on plans has thus far focused on two main goals, in the sense that scholars have sought to understand not only the relationship between plans and actions, but also how organizational members orient themselves to plans to make sense of their work in contextually specific ways. Several empirical studies have explored how plans are used as artifacts for the coordination of work activities, analyzing how plans' relevance is occasioned in the circumstances of their use (Bossen and Markussen, 2010; Button and Sharrock, 1998; Dant and Francis, 1998; Koskinen, 2000; Randall and Rouncefiel, 2011; Rönkkö et al., 2005; Schmidt, 1999). This research has demonstrated that plans can be used in various ways, such as for the reconstruction of courses of actions (Dant and Francis, 1998) or as 'perceptual background' against which to identify troublesome elements or situations (Koskinen, 2000). These studies have also investigated what happens when plans do not work out (Bardram and Hansen, 2010; Rönkkö et al., 2005) and the impact of the medium of schedules for solving problems of coordination (Whittaker and Schwarz, 1999).

5.4 Temporal coordination and planning

Plans as "valuable mechanisms for giving order to work" (Bardram, 1997; p. 18) are often employed in organizational settings for the temporal coordination of work activities. However, no systematic attempt has been made to link the study of

temporality and planning. In the CSCW community, there is growing interest in the role of temporality in the coordination of work activities as more and more scholars have noticed a lack of research focused on temporal coordination compared with spatial coordination, thereby undermining the possibility for software to adequately support cooperative work.

Among the studies exploring temporality for work coordination, studies have examined long-term timeframe coordination (Karasti et al., 2010) as well as short-term timeframe coordination (hours or days), focusing more on temporal coordination within the organization than within a single team at work (see: Egger and Wagner, 1993; Bardram, 2000; Reddy et al., 2006). Other research, though not directly addressing the issue of temporal coordination, has shown both the failures of schedules in organizing the temporal order of work activities and the modality through which plans can be used to achieve the temporal coordination of activities. These studies have shown that schedules might define deadlines inaccurately or in a non-credible or consistent way (Whittaker and Schwarz, 1999), and that particular efforts are necessary for people to meet deadlines. For example, Button and Sharrock (1996) found that the orderliness of work depends on the reflexive relationship between the schedule, which orients work activities, and the way in which such activities are carried out in order to meet fixed deadlines. Meanwhile, other research has investigated the role of temporal patterns in providing means for the coordination of work (Reddy and Dourish, 2002; Nilsson and Hertzum, 2005). In the study of temporality for the coordination of work activities, there is an increasing interest in the practice-based perspective of time (Reddy et al., 2006; Karasti et al., 2010), which was first developed by Orlikowski and Yates (2002), who suggest considering people as "experiencing time through shared temporal structures [that] they enact recurrently in their everyday practices". Thus, people are oriented towards the means that organizations provide for the objective organization of time (e.g., schedules), while these constraints simultaneously enable different actions so that "temporal structures both shape people's actions and are shaped by such actions" (pp. 686-689).

5.5 Local knowledge

The EM-oriented study of members' practices (Llewellyn, 2009) is suited to investigating planning as an instructed action in that, by permitting detailed observation of members' active conduct, it enables us to identify the link between knowledge and action (Llewellyn, 2008; p. 783). In other words, the study of practices allows us to access the RCT operators' local knowledge (or local expertise)—that is, the corpus of knowledge,—mostly informal—that emerges from what they have experienced, and whose relevance depends on local circumstances of work (Normark and Randall, 2005; Randall et al., 1996) that include knowledge of how to deal with procedures, and in general, the knowledge that is necessary for the contingent enactment of organizational requirements and ultimately for the orderly accomplishment of work. The term 'local expertise' is used here to address the operators' competence in bringing anticipated projects to fruition by means of their decisions during planning that, in turn, show their local understanding and application of the instructions for stand and gate allocation.

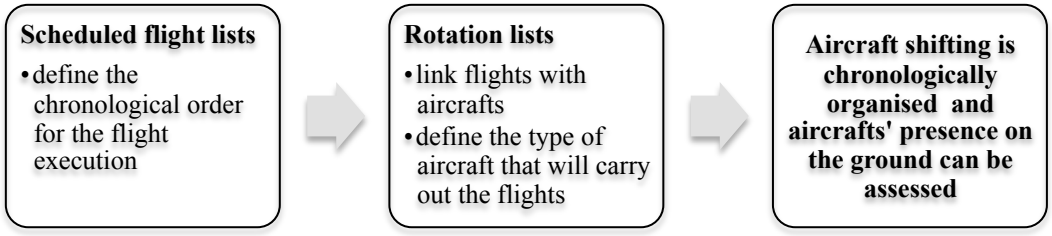
The RCT operators' practices analyzed here represent patterns of activities not reported in protocols, but to which the operators show themselves to be oriented to in that they know that they are expected to follow these practices and justify any deviation to colleagues. In particular, the focus is on how local expertise on temporality in planning allows for the management of the contextual conditions of work. Extracts reported here come from the ethnographic interviews collected in the course of the study.

5.6 Planning stand allocation

As explained in Chapter 4, the stand allocation plan is defined when the operators know the exact number of planes that need to be parked, their size, their arrival and landing time, and how long they will stay on the ground. RCT operators receive this information twice daily from cargo and passenger airlines; the information is shared in the form of 'rotation lists'. The rotation lists are documents in which each airline company matches

aircraft with the flights to be carried out the next day. This information enables the RCT operators to determine not only the number of planes to be parked and the time of their arrival and departure, but also how flights are assigned to planes. Thus, they can assess how long each plane will stay on the ground (see Figure 5.1).

Fig.5.1: Matching schedules with rotation lists



For the stand allocation plan to be set up, the RCT operators have to consider the number of stands and gates at their disposal, as well as the stands' technical features. Stand features enable their exploitation in different ways, so that possibilities and constraints in their use emerge as a consequence of planning itself. Stands are identified according to their maximum capacity (which, in turn, is defined on the basis of the length of the fuselage and the wingspan of the biggest aircraft that can be parked there), the maneuvers allowed to reach and leave them, and the number of parking areas that cannot be used simultaneously (see Figure 5.2).

Fig. 5.2: Technical features of stands

Stand number	1	2	3
Capacity	Up to B757	Up to B747	Up to B737
Maneuvres	Push back	Self-maneuvring	Push back Self-maneuvring
Inhibitions	2 3 4	1 3 4	2 4 5

Parking areas for aircraft have different dimensions to appropriately accommodate the various planes, whose sizes vary considerably. Each stand can accommodate different types of aircraft as they can be used to park planes whose size does not exceed the maximum capacity of the stand. It is important to understand the maneuvers required for each type of plane to leave the stand as different types of aircraft maneuvering requires a different amount of space when moving into and out of the stand. Stands might also have overlapping exit ways, so their use might be limited during plane maneuvering. Stands are distributed over the ramp and the apron space. The ramp space is the airside area next to the terminal building, while the apron is an area far from the terminal building.

Like stands, not all gates are equal. Gates, which have different features, can be directly connected with stands by means of fixed jet bridges (structures the RCT operators call 'fingers'); thus, the use of stands and gates has to match. In other words, once a stand is assigned to a certain flight, the boarding procedures of that flight have to take place at the gate structurally linked to that stand. In addition, while some stands allow passenger to board on foot, others do not, meaning that buses have to be provided for the latter. RCT operators plan the use of stands and gates according to the schedule working sequentially on the plan set up.

Although software devoted to determining stand allocation is available, RCT operators never use it for automatic stand allocation; rather, they use it to aid in the manual allocation of stands, exploiting the fact that the software highlights conflicts during stand allocation. The software presents stands in a Gantt chart that allows for the visualization of stand allocation over time by means of icons that represent the length of planes' stay

on the ground and by means of a color code system that alerts the operators whenever conflicts in stand allocation emerge. For example, the alarm color code would signal a mismatch between the size of the stand and the size of the plane.

5.7. Managing time when planning in the RCT

When planning, the RCT operators do more than solve space allocation problems as they not only match stands with planes' dimensions, but also—by allocating stands and gates—plan with the aim of contributing to the coordination of handling activities. The careful exploitation of gates and stands allows for the convergence of passengers, equipment, and personnel when necessary, thereby ensuring the timely execution of handling activities and ultimately maintaining the coordination of activities necessary for flight execution. Yet, to achieve this result, the RCT operators have to address three main problems connected with temporality: ensuring the stands' availability over time, monitoring the duration of handling activities, and keeping delays under control.

5.7.1 Ensuring the stands' availability over time

For plans to ensure timely assistance to planes stands must be available to accommodate arriving planes for the entire duration of their stop. To achieve this goal, the RCT operators have to set up the stand and gate allocation plans within fixed deadlines, even if they neither receive all the rotation lists simultaneously, nor receive them in time to set up the plan. This implies that the RCT operators often have to plan in relatively uncertain conditions. In addition, when the RCT operators establish their plans, they never have empty bays to fill as they always have planes on the ground whose allocation was defined by previous planners.

> If three airbuses are going to arrive, I have to put them at 37, 40, and 42, respectively, and this inhibits the use of several stands: 36, 38, and 39. In the evening, 14 Redair planes are going to arrive, then we could have the Blueair and perhaps the Pinkair, so we have to study how to assign stands (Track 2 10/05/2011).

RCT operators not only have to ensure appropriate gate and stand allocation within the planned period of time, but they also have to consider that their planning has effects that extend over each period of time planned, thereby undermining stand availability over time. It is therefore strategically relevant for RCT operators to plan in such a way that it does not threaten their ability—or that of the next planners—to allocate stands effectively.

Practically speaking, the operators succeed in preventing planning from negatively impacting the maintenance of stand availability by drawing on practices that allow for the identification of usable spaces. The identification of usable space consists of evaluating whether stands free at a certain time correspond with the need for usable spaces. The identification of usable space mostly draws on operators' knowledge of recurring patterns in schedules and is devoted to defining stands that—even in the absence of certain pieces of information about the number, movements, and dimensions of the incoming planes—should be kept free, as it is likely that they will be needed for planes arriving subsequently. For example, RCT operators who plan the evening allocation—even if they do not know the number of cargo flights that will arrive that night—reserve an area of the ramp for cargo flights when planning to ensure that stands for those possible flights are available for the colleagues who follow them. At night, arriving planes often remain on the ground overnight; without reserving some stands, it would not be possible to find parking areas suitable for incoming cargo flights, which are usually wide-bodied aircraft and for which it is particularly difficult to find appropriate stands, as there is a limited number of large stands.

Adopting these planning practices usually makes operators' own planning more difficult: the higher the number of usable stands, the less complex the stand allocation process, because the distribution of aircraft over several stands facilitates synchronization of the use of stands with departures and arrivals. A similar situation occurs when information about the arrival of charter flights is certain.

> Today we know that tomorrow a Tupolev will arrive and that we have to park it at stand 2. The use of stand 2 inhibits the use of all these other stands so we and

> our colleagues would never assign, for example, stand 1 to another aircraft (Track 6; 10/07/2011).

As such, regardless of whether the information about the movements of planes is certain or not, RCT operators consider the free stands usable as long as this assumption does not interfere with the forthcoming planning, either definitively or potentially.

The RCT operators not only plan to prevent stand unavailability, but also to ensure the availability of stands on the ramp in particular as assisting aircraft on the ramp is less complex in terms of organization and less time consuming. The RCT operators' planning ensures ramp availability in terms of both planes' length of stay on the ground, and the ordered use of stands. For example, RCT operators usually assign stands on the apron to planes that stay on the ground for long periods of time. This does not mean that the operators' choices about where to park aircraft are standardized. If, in fact, an aircraft is expected to stay on ground for several hours, but RCT operators consider it likely that the aircraft will be used ahead of schedule, despite the information available to them showing the contrary, they might decide not to park that aircraft on the apron.

> It's the case of Sxxair. Yesterday evening we had a plane that would have remained the whole next day on the ground. We know that, if an aircraft needs to be replaced, the Sxxair staff uses the aircraft that is already on ground, so instead of parking the aircraft on the apron to have a stand free on the ramp, we decided to park it on the ramp. This morning, when Sxxair changed the rotation list, we already had the plane on the ramp and were able to board on time (Track 6; 10/07/2011).

In addition, the RCT operators allocate stands for maximum capacity as much as possible to keep the biggest parking bays, which are limited in number, free for aircraft that need them.

> I try to use stands for their capacity. I do not park aircraft in stands that have a bigger capacity because it is not advantageous in terms of space use. As you can see, I can use this self-maneuvering stand for an airbus but this way we would lose the use of these other stands and this is nonsense. You have to know the stand capacity and to work as the others do (Track 6; 10/07/2011).

5.7.2 Monitoring the duration of handling activities

The RCT operators not only plan to prevent stands' unavailability, but also with the aim of keeping the duration of handling activities under control so as not to cause delays in planes departures. RCT operators do not decide the amount of time necessary for handling planes; the airline companies set the duration of turnaround time, although they also recognize that the allocation of stands and gates is essential for contributing to the timely execution of flights. Indeed, the allocation of stands can impact on both the duration of the turnaround activities and the convergence of ramp personnel necessary for timely assistance to planes on the ground to get started.

The methods adopted by RCT operators during stand allocation for the timely execution of handling activities include measures for both promoting the immediate execution of handling activities when necessary, and preventing circumstances that could increase the time necessary for their execution. Promoting the timely execution of handling activities is characterized by 'time-saving practices'—namely, planning measures that aim to reduce the time necessary for the execution of some of the turnaround activities and for the convergence of ramp personnel at stands when their presence is necessary. The timely convergence of personnel at stands is achieved by minimizing occasions that require personnel to move on the apron and ramp space as well as reducing the distances that they have to cross. Meanwhile, the prevention of delays is pursued by assigning stands and/or gates with the aim of shortening the time necessary for the execution of specific handling activities as well as by planning to avoid conditions that produce delays in the execution of the handling activities.

Operators promote the timely execution of handling activities by assigning stands so that planes are next to the equipment needed to handle them. The use of the ramp and apron is arranged between the four handling companies that work in the analyzed airport. A specific area of the ramp space is dedicated to each company, and they keep their own equipment for assisting planes in a timely manner in their dedicated space. Although most of this equipment is movable, handlers prefer to keep it in the same place for several reasons. Vehicles can move on the ramp using predefined routes, but the

continuous movement of vehicles exposes them to damage, is expensive, creates traffic jams, and is time-consuming. In addition, the continuous movement of supplies increases costs and the risk that handlers will not have them ready when and where they are needed. For these reasons, RCT operators usually try not to park aircraft handled by one company on the ramp space assigned to another company, especially as airline companies have flights scheduled in the same periods of time.

Operators prevent circumstances that could increase the time necessary for executing the handling activities through the careful allocation of gates to flights. They try not to assign flights directed to similar destinations in adjacent stands during the same period of time. This approach to planning gate use draws on the RCT operators' knowledge of passengers' behavior. Passengers might be late or misread the monitors, causing them arrive at the wrong gate. Boarding flights with similar destinations contiguously can increase this kind of confusion and passenger mistake, thereby creating more disruptions in the boarding process. In these cases, passengers can complain, and the operators at the gates have to spend time instructing them, which can slow down the boarding process. Increased boarding time negatively impacts turnaround procedures and, consequently, the possibility for the plane to depart on time. Thus, RCT operators try not to create such unfavorable conditions.

RCT operators also contribute to the timely execution of handling activities through the intensive use of gates connected with stands via fingers, instead of gates which require boarding by bus. Boarding on foot is quicker than boarding by bus. Time saved moving passengers can compensate for delays in the execution of other activities, such as passengers seating. In addition, boarding on foot allows bus use to be contained—they are a limited resource—and ultimately reduces the costs of each handling procedure.

5.7.3 Keeping delays under control

Stand allocation can be used to keep delays under control thanks to the adoption of methods for planning that make it possible to limit delays when it is foreseeable that temporal boundaries for handling will be exceeded. Ideal conditions for RCT operator planning are those in which they can allocate stands so as to park all the scheduled

aircraft on the ramp, while also respecting safety and security requirements, ensuring the timely execution of handling activities, and meeting airline companies' preferences regarding the allocation of stands.

However, when the number of flights to park is high, this is not possible, and operators have to assign planes to stands on the apron. As previously explained, organizing assistance for planes on the apron is a complex process, as both the equipment and personnel necessary for handling the planes have to be transferred from the ramp to the apron. In addition, these transfers backfire on the organization of ramp activities, as the time required for ground operators to move back and forth between these two areas increases, making it more likely that delays will occur in aircraft assistance as a whole. Thus, when operators have to plan in less-than-ideal conditions—that is, conditions that will probably cause delays—they allocate planes in such a way as to minimize delays, such as by assigning stands on the apron to passenger flights with the fewest passengers to board or disembark or to cargo flights that only have to load or unload parcels. In this way, the RCT operators succeed in maintaining good relations with all parties involved in handling planes, and with airline companies in particular.

5.8 Discussion

As previously mentioned, the careful exploitation of gates and stands allows for the convergence of passengers, equipment, and personnel at gates and stands when necessary. Even though stand allocation involves the organization of seemingly simple changes in the use of the field (stands, as well as gates, may be free or occupied), the process actually embodies the possibility for handling to take place as expected. Thus, it can be concluded that stands, as well as gates, are not equivalent structures, not only because of their distinct technical features and different positions in the airport space, but also because the allocation of these areas has different relevance in terms of their position in the airport space, given the type and numbers of flights scheduled in certain periods of time.

As the previous discussion indicated, RCT operators have to deploy a specific corpus of local knowledge (Carassa, 2000; Normark and Randall, 2005) to deal with problems that emerge during planning in order to ensure the timely execution of handling that, in turn, is related to their knowledge of 'how things usually go'—whether in terms of knowing how passengers behave, how flights are usually planned, how changes in the rotation lists are managed by airline companies, or how operators on the ramp deal with accomplishing aircraft assistance. In particular it seems possible to say that operators' knowledge of temporality in planning is organized in terms of knowledge of the temporal horizon of planning, the span of planning, and the management of temporal ambiguity.

5.8.1 Temporal horizon and temporal span in planning

The term 'temporal horizon' refers to people's use of their knowledge of likely future events for the organization of their current activities in the absence of protocols that have to be followed in "lock step" (Reddy et al., 2006; p. 42). Reddy et al. developed this concept primarily to highlight how individuals perceive their own activities as temporally organized, showing how people increase or decrease the pace of the execution of their own activities in order to comply with deadlines. Here I contend that the concept of temporal horizons can be used effectively to focus on the nature and complexity of problems that people expect to arise when meeting deadlines, as well as the way in which they address such problems.

The temporal horizon of planning refers to the fact that the RCT operators know that the plan setup has temporal deadlines that cannot be exceeded and that they have to arrange their planning to comply with these requirements despite actual circumstances. The RCT operators' main difficulty in complying with these temporal requirements is not finishing the plan setup in time, but rather setting up the plan in spite of the lack of certain information about flight rotations.

The operators' knowledge of the duration of the effects of planning is explained here in terms of the 'temporal span of planning'. The temporal span of planning does not correspond with a precise prediction of the effects of planning over time; thus, the

evaluation of the impact of one operator's planning can be better described in terms of approximate estimations to which methods for planning correspond. The operators manage both the temporal horizon of planning and its temporal span, drawing on practices that allow for the identification of usable space and the maintenance of ramp space usability.

Recasting the operators' local knowledge on temporality in terms of the temporal horizon and span of planning allows for a better understanding of the types of problems that planning as a distributed activity imposes on planners, who have to articulate (Schmidt and Simone, 1996) their planning over time. The distinction between horizon and span of planning highlights that the continuity of proper stand allocation cannot be taken for granted; it has to be actively pursued and is achievable only by means of the application of precise planning practices. The operators' practices for the identification of the usable space, in particular, restrict the number of usable stands; although this makes their own planning more difficult, it facilitates their colleagues' subsequent stand allocation. This also means that the practices for planning that make efficient stand allocation possible are the same as those that allow for the connection of planning over subsequent shifts. In air traffic control, cooperative functions are embedded in the execution of work in a similar way (see: Berndtsson and Normark, 1999a).

It is also worth noting that all the practices for the management of horizons in stand allocation optimize the use of the resources at operators' disposal, thereby contributing to the complexity of colleagues' planning as well. If delays occur in the execution of handling activities due to improper planning and flights are not carried out as scheduled, reasonable expectations about plane departures—and thus about the availability of stands—are no longer possible.

5.8.2 Managing temporal ambiguity

Egger and Wagner (1993) defined temporal ambiguity as the effect of the impossibility of organizations' respecting temporal boundaries in which work activities are organized. Temporal ambiguity refers to the difficulty organizations face in maintaining orderliness and predictability in the execution of work activities. According to Egger and Wagner's

definition, organizations deal with temporal ambiguity through scheduling. I contend here that the RCT operators are aware of the temporal ambiguity that improper stand allocation might cause; as such, they adopt measures to both avoid and contain the temporal ambiguity as much as possible when planning.

Stand allocation can be used to prevent temporal ambiguity thanks to the planning methods adopted that allow for handling to be executed in a timely manner. However, it can also contribute to the control of temporal ambiguity when it is foreseeable that temporal boundaries for handling will be exceeded, as previously explained. The focus on temporal ambiguity highlights how planning can contribute to maintaining order at work, thereby enriching our understanding of the use of plans in workplace settings. In addition the description of operators' planning practices for keeping delays under control by controlling temporal ambiguity indicates how planning methods allow them to comply with contingent situations and identify which changes in work circumstances trigger such modifications in planning methods.

5.8.3 The features of temporal allocation of stands

The analysis of planning practices not only allows for a deeper understanding of planning as situated practice, but also for the revision of the existing definitions of 'allocation'.

As previously explained, the RCT operators allocate stands with the aim of keeping the duration of handling activities under control so as not to cause delays in plane departures. However, none of the existing definitions of 'allocation' give an account of what 'allocation' consists of for the RCT operators. Drawing on coordination theory, Malone and Crowston (1994) recognize allocation as a basic process for coordination—that is, for the management of interdependent work activities. They concluded that allocation consists of the process necessary for the organized use of shared resources for different users who often have conflicting interests. Meanwhile Bardram (2000), drawing on activity theory, suggests that allocation consists of deciding how much time to dedicate to various activities according to temporal priorities.

It is suggested here that theoretical approaches to studying allocation processes might be inadequate for the understanding what allocation consists of in situated contexts and, thus, for understanding how people deal with the problems that specific forms of allocation raise. Therefore, I suggest that considering the study of 'allocation' as a situated phenomenon in order to understand what people mean when using this term allows for a deeper understanding of how it is related to the solution of time management problems. A definition of 'allocation' that better describes RCT operators' practice is the organization of resources between different users following temporal priorities for the promotion of the timely execution of work activities within certain periods of time.

5.8.4 Deficiencies of constraint programming techniques applied to stand allocation

Existing stand allocation software is based on constraint programming techniques (Hon Wai Chun et al., 2000). Although this software automatically generates the stand allocation plan, as previously indicated, RCT operators do not rely on the automatic allocation of stands as they consider the software inadequate. This inadequacy stems from the fact that the software is ineffective at sustaining planners' articulations and evaluating the effects of stand allocation on the coordination of the handling activities. The software does not favor the efficient connection between stages of plans in that it cannot create plans in the absence of certain information about flight rotations. In addition, automatic stand allocation based on constraint programming techniques fails to consider the effects of stand allocation on the timely execution of the handling activities. Thus, it seems reasonable to say that, when several solutions to the same stand allocation problem are possible, the operators are better able than the software to choose the stand coherently given their orientation towards the allocation of stands for the timely execution of handling.

5.8.5 Maintaining the essential coordinative functions of planning stand allocation

Crabtree et al. (2000) asserted that the main objective of an ethnographic study of work settings for system design should be to understand "what to automate and what to leave to human expertise". This research is not oriented to software design; nevertheless, it

enables some considerations for improving the system for stand allocation. In fact, even though software for automatic stand allocation can be improved by incorporating the evaluation of further constraints to support the plan setup in a more consistent way, it seems unlikely that this software could substitute humans in managing stand allocation, due to the strong impact of local knowledge on time management in planning.

Instead, it is suggested that software should be designed to support the enactment of planners' planning intentions. In other words, it is argued that it is necessary to abandon the idea that software for stand and gate allocation should help with merely identifying misapplications of the organization' s requirements about stand and gate allocation in actual work conditions in order to instead take up the idea that software should be designed to support allocating stands and gates in accordance with operators' vision about planning, as well. In that the study of the setting plays a key role in that it unveils the expected outcomes of planning and the methods adopted to bring reality to such anticipation and therefore to understand how to support them. In this case, for example, coherently with research on the need to increase the integration of airport operations (see: Atkin et al., 2010; Kelemen, 2004), data suggests it is necessary to develop software that conceptualizes the problems of gate/stand allocation and plane handling as integrated rather than separated phenomena.

5.9. Concluding remarks

The success of plans in the RCT as temporal coordination devices depend on their drawing on the RCT operators' shared methods for plan production that allow for the allocation of resources in accordance with local work condition, such as the actual use of stands and gates, but also with visions of plans shared by planners that are embodied in the way stands and gates are allocated. As discussed here, this definition of allocation does not correspond with definitions of the same process developed from theoretical points of view—namely, that of coordination theory and activity theory—but rather emerges from the situated study of the setting. It is not contend that this definition of

allocation should replace existing ones; instead, it is suggested that theoretical approaches to the study of allocation processes might be inadequate for comprehending what allocation consists of in situated contexts and, consequently, how people deal with problems that specific forms of allocation raise, thereby impeding the implementation of software for the coordination of work activities by means of resource allocation. I also suggest that the software design should be oriented to ensuring the embodiment of planning visions while respecting the instructions of the use of stands and gates.

This analysis of planning enriches the understanding of the use of plans as organizational artifacts in that this study shows how planning can simultaneously impact coordination in time and space by managing the substantive contents of the field. As such, this study enables CSCW scholars to determine how temporality and distance affect coordination as intertwined phenomena that future empirical research can help further clarify.

6. Reconsidering the role of plans and planning in managing the unexpected

This chapter challenges the received understanding of the role of plans and planning when organizations deal with contingencies. Research into organizations' management of the unexpected has thus far mostly opposed the ongoing understanding of emerging factors and the use of plans and planning that are recognized as treating the organization's capability to detect the unexpected and useful solely for managing expected events. The objective of this chapter, instead, is to reveal that such conceptualizations of plans are fraught with misconceptions and, by showing the RCT operators' planning practices devoted to dealing with contingencies, to refute them empirically. By investigating planning as an instructed action, it is possible to focus on the planning practices that contribute to the organization's ability to adapt to contingencies and to show that they permit the management of contingencies by reflexively relating it to the ongoing provision of the resources necessary to do that.

6.1 Introduction

The objective of this chapter is twofold. On the one hand it aims to show that existing organizational theories fail to recognize the variety of functions that plans play in the management of organizational uncertainty due to their conceptualization of what 'plans' and the 'unexpected' are. On the other hand, it shows that their understanding of the role of plans in managing the unexpected can be significantly improved when focusing on the work necessary to set them up as tools that aims to deal with the changed circumstances in which they are used. In order to develop this argument the chapter first presents theories that focus managing unexpected events in organizational settings and their understanding of plans and planning and then it confronts them with the results of the analysis of the empirical material on planning collected in the RCT.

6.2 Organizations dealing with the unexpected

The understanding of how organizations deal with the unexpected has been investigated based on different conceptualizations of what the unexpected is and of the resources at the organizations' disposal to deal with surprising problematic events.

The study of organizations as complex adaptive systems (CAS) studies organizations as characterized by nonlinear dynamics and emergent properties, by diverse agents interacting with each other, and by being self-organizing (McDaniel and Driebe, 2005; p. 4). The study of organizations from this perspective implies that surprise is "inevitable because it is part of the natural order of things and cannot be avoided, eliminated or controlled". If surprise is the result of the fundamental unknowability of the world, the study of the unexpected could be carried out by approaching surprise as an opportunity instead of as an error, thereby allowing the search for innovative approaches to situations (McDaniel and Driebe, 2005; pp. 7-8).

Weick (2004), instead, develops an original approach studying organizations' ability to deal with the unexpected that takes as a starting point the study of sense-making in organizations. This approach, which is strongly inspired by pragmatism[10], focuses on the role of individual and organizational sense-making. It conceptualizes organizations as 'impermanent', that is, as fabricating their permanence out of streaming of experience (Weick, 2009; p. 4) thanks to retrospective sense-making (Weick, 1995), which is the active construction of sensible events out of discrepant events or surprise[11]. Weick's approach to studying organizing has led to the development of research on the organizational capability of maintaining function and structure in the face of disruptions, or 'organizational resilience' (Weick and Sutcliffe, 2007), and to the identification of 'mindfulness' as a key factor for maintaining organizational reliability. In Weick and

[10] For ideas that have influenced Weick's theorizing of the study of organizations and organizing, see Weick, 2004.

[11] Weick asserts that "[the] sense-making process has seven characteristics: it is grounded in identity construction; it is retrospective; it is enactive of sensible environments; it is social; it is ongoing; it is driven by plausibility more than by accuracy; and it is focused on and by extracted cues" (see Weick, 1995; p. 17).

Sutcliffe's opinion, organizations are able to deal with the unexpected when they are able to counteract the tendency to seek confirmation of their expectations. Indeed, they assert that expectations of how the world operates provide a considerable framework for the accomplishment of work, but also bias people's perceptions of the world.

> "People are more likely to search for confirming information and to ignore information that is inconsistent with their expectations" (Weick and Sutcliffe; 2007; p. 26).

The resilient engineering approach, instead, focuses on the resources that usually allow people to anticipate and adapt to the potential for surprise and failure (Hollnagel et al., 2006; 2011). This approach, in fact, takes for granted the organizations' awareness of the potential paths to failure and ability to act so as to forestall these possibilities. This is why engineering ergonomists are not so interested in defining a theory of 'error', but instead in understanding how individuals and systems struggle to anticipate the path of failure and to increase and sustain failure-sensitive strategies in a world "fraught with gaps, hazards, trade-off". In this way, they can help the organization to develop mechanisms to create foresight as well as anticipate and defend against the path of failure (Woods and Hollnagel, 2006; pp. 2-6).

As already mentioned, the concept of 'situated actions' developed by Suchman (1987), though oriented to the understanding of how humans accomplish purposeful actions more than to the conceptualization of the organization's functioning, has had a strong impact on understanding organization functioning as well because it has made it possible to understand that actions depend in essential ways upon the material and social circumstances of their occurrence: "the approach is to study how people use their circumstances to achieve intelligent action" (Suchman, 1987; p.50). Within this approach plans are recognized as resources for situated actions and as formulations of situated actions whose efficacy inevitably depends on their relationship with the circumstances in which actions occur. Suchman, in fact, states that "the significance of plans turns on their relation back to the unique circumstances and unarticulated practices of situated activity" (Suchman, 1987; p. 185).

6.3 The features of unexpected events

The framework for studying the how organizations deal with the unexpected previously described have approached the problem of identifying the features of unexpected events in different ways and developed different conceptual tools that can be used as an aid in approaching organizational surprises.

Cunha et al. (2006; p. 322), inspired by the CAS theory, suggest a typology of unexpected event based on the combination of expected or unexpected issues with expected or unexpected processes, where identifiable issues are discrete entities, while processes are the unfolding of some sequence whereby several non-identified causes interact to produce the unexpected outcome.

Fig. 6.1: Typology of unexpected events (Adapted from Cunha et al., 2006)

	Expected processes	*Unexpected processes*
Expected issues	**Routines** Events that can be anticipated	**Creeping developments** Expected issues take unexpected shapes while unfolding
Unexpected issues	**Sudden events** Unexpected issues introduced impromptu lead to an expectable process and outcome	**Loses meaning** Novel, incomprehensible situations

Yet Weick and Sutcliffe (2007, pp. 25-30) claimed that unexpected events are those events for which organizations are not ready. In their opinion, unexpected events can take three different forms: events that were expected to happen but failed to occur; events that were not expected to happen but do happen and events that were not thought about happening. Thus, organizations have two main problems when dealing with the unexpected: they need to increase their understanding of the third type of events—that is, imagine events that might occur—and they have to deal with the tendency of workers to

normalize the unexpected—that is, to treat unexpected events as if they were slight and innocuous deviations from the expected.

In the resilient engineering approach, as well as the situated action approach, on the other hand, there is no particular interest in defining a theory of 'error'. Rather they are interested in understanding how individuals and systems, respectively, struggle to anticipate the path of failure, and in highlighting that every action occurs in circumstances that it is not possible to fully anticipate, and that are continuously changing around us. The unexpected is thus inevitably part of all purposeful action.

6.4 Plans and the unexpected

Within these frameworks, plans—that is, organizational devices used to anticipate future events—, and planning are recognized as playing a minor role in managing the unexpected, or even as treating the organization's capability to face the unexpected. Cunha et al. (2006) asserted that plans and planning play a key role in managing expected issues, as standard operating procedures or organizational routines are usually formalized in the form of plans. Researchers within the resilient engineering approach, on the other hand, though they recognize the usefulness of plans in the face of pressure to increase efficiency (Ferreira et al., 2011), and that missed opportunities to re-plan when surprises occur constitute sources of failure (Woods and Shattuck, 2000), do not study plans as key resources for enacting the organizations' capability to forestall potential paths of failure. As a consequence a systematic attempt to understand the role of plans in anticipating surprise and failure is still missing in this stream of research.

Suchman instead described plans as weak resources for executing actions in the sense that they cannot represent all the changing circumstances of their occurrence, even though she recognizes that their usefulness depends precisely on this vagueness.

> "By abstracting uniformities across situations, plans allow us to bring past experience and projected outcome to bear on our present actions" (Suchman, 1987; p. 185)

As explained in Chapter 3, the concept of 'situated action' and the characterization of plans as 'weak resources' for their accomplishment, has led scholars with different theoretical backgrounds interested in understanding the dynamics of cooperative work to wonder how plans are used to support the enactment of cooperative work in organizational settings. This stream of research shows that plans are used multifariously within organizations (see among others Bardram, 1997; Bossen and Markussen, 2010; Schmidt, 1999, 2011b; Whittaker and Schwarz, 1999) and for managing emergencies (Schafer et al., 2008; Tena et al., 2014). It also shows the way planning is used to deal with the occurrence of non-pre-planned events (Bardram and Hansen, 2010) but, trapped by Suchman's dogma, that plans cannot represent all the changing circumstances of their occurrence, it does not conceptualize plans as tools that can anticipate contingencies and provide for them.

Weick (2009; p. 6) argues that plans are often used in organizations to preserve the illusion of permanence and keep surprise to a minimum. In a similar vein, Weick and Sutcliffe (2007) claim that plans play a key role in the normalization process of unexpected events that prejudice the possibility of organizations to recognize small events as signals that things are not developing as they should.

> "People search for confirmation in other forms of expecting such as routines and plans … Plans guide people to search narrowly for confirmation that plans are correct … and plans lure you into overlooking a buildup of the unexpected" (Weick and Sutcliffe, 2007; p. 26).

This is why sensitivity to action necessary for an organization to be mindful requires "less attention to plans and more attention to emergent outcomes that are set in motion by immediate actions" (Weick and Putnam, 2009; p. 102).

6.5 Building on conceptualizations of plans for managing the unexpected

It is reasonable to say that all these theoretical frameworks lack recognition of the fact that plans can be key resources for organizations' ability to deal with the unexpected for two main reasons: on the one hand they perpetuate stereotypical understandings of plans,

and on the other they conceptualize what is unexpected as surprising, and as necessarily requiring improvisation. This research, in fact, mainly takes for granted that plans cannot be used to manage unexpected events because they cannot anticipate all the contingencies that might occur during the execution of work. But even if it is true that plans cannot anticipate everything, the fact that they cannot be used to deal with the unexpected is not necessarily consequential. Plans are also stigmatized because they are recognized as causing actions. For example, as Weick and Sutcliffe (2007) claim, plans are considered to cause the confirmation of their own validity. But plans cannot cause any actions. Instead, as Suchman (1983) has clearly shown, the fact that plans are designed, say, to standardize work, does not make the execution of work standardized because it is the operators' working out practical contingencies that makes work appear to have been executed in a standardized fashion. For this reason Weick and Sutcliffe' s (2007) suggesting that organizations pay less attention to plans in order to remain sensitive to action appears to be unfounded: plans cannot guide people either to confirming their correctness or to overlooking the unexpected. On the contrary, it seems reasonable to say that organizations can be mindful when they are aware of the way plans are used (or misused) to focus attention on the unexpected and to contribute to organization sense-making. In fact, as Koskinen's (2000) work shows, plans are used to support organizational sense-making. In addition, the approaches presented above seem unable to recognize that what is extraordinary is not necessarily surprising and does not necessarily require improvisation to be dealt with. Indeed, unexpected events are of different types: there might be unexpected events that are trivial contingencies or routine problems and therefore not surprising at all—even if they can disrupt organizational functioning, such as a client's last-minute request to transport parcels to a carrier company—; there are events that are extraordinary but still within the range of what there may be ready-made contingency plans for, such as a factory evacuation plan in case of fire; and there are extraordinary events for which one has to improvise solutions, such as dealing with the 2001 World Trade Center attack.

To summarize, it is possible to say that when preconceptions about plans are properly unpacked, then it is not only possible to make generalizations about the role of plans in

the face of the unexpected, but a new analytic sensitivity arises because it becomes possible to look for the use of plans in managing the unexpected. For example, based on this premise it is possible to notice that routine changes in the circumstances of action can be managed using plans and then looking for ways this is made possible. This is what this ethnomethodologically-informed research (Randall et al., 2007) has done, focusing on the operators' deployment of their local knowledge (Randall et al., 1996 but also see Carassa, 2000)—that is, the operators' competence in enacting planning outcomes through their decisions during the set up and change of plans as is shown in their planning and re-planning practices (Llewellyn and Spence, 2009). Put differently, this research helps shed light on how plans can be used to deal with 'routine unsurprising disruption', that is, potentially disruptive events that organizational members consider likely to occur, but which they do not know much about—for example the magnitude, frequency, and/or time of occurrence, looking at how plans are designed by competent followers of planning instructions (Garfinkel, 2002).

6.6 Planning the unexpected in the RCT

As previously explained, one of the RCT operators' main responsibility is the allocation of stands and gates to flights. The operators have to allocate stands and gates while respecting the flights' technical features, and safety and security requirements, but when planning they do more than this. The operators also plan in order to ensure the timely execution of handling activities as they know that the way they allocate stands and gates affects whether the operators on the ramp can carry out the handling activities in a timely manner. However, the RCT operators also plan so as to be able to deal with the unexpected because they plan and re-plan to create and maintain their plans' adaptive capacity. Drawing on Woods' (2006) work, though attributing different meaning to the terminology he has developed, it is possible to say that, when planning, the RCT operators define the buffering capacity of planning, its flexibility, and the margin by drawing on their knowledge of their plans' tolerance—that is, their knowledge of the conditions that affect the usability of the plans, and their knowledge of the capacity of

their planning to compensate for these kind of conditions. In other words, the RCT operators define the kind of disruptions that plans can absorb without a breakdown in structure, they actively plan to create and maintain the plans' ability to be restructured in response to external changes, and they plan and re-plan in order to control the plans' margins—namely, how precariously the plans are likely to operate relative to other performance boundaries.

6.6.1 Defining the buffering capacity of planning

When planning in the RCT, operators do not try to deal with any kind of unexpected events; rather, they consider only events that they know are highly likely to occur and whose occurrence does not undermine the usefulness of the stand and gate allocation plans. Thus, for example, the operators do not plan to deal with a hijacking because this is quite a rare event whose occurrence affects the functioning of the entire airport and, consequently, makes stand and gate allocation plans useless or which would require substantial changes. Therefore, the operators plan and re-plan to be able to manage changes in scheduled flights, such as flight delays or arrivals ahead of time, and last-minute increases in the numbers of the incoming aircraft. In fact, airline companies sometimes add charter flights at any moment, or flights might be diverted to the airport due to bad weather conditions that prevent them from landing at the original location.

Selecting unexpected events to plan for allows the operator to keep the complexity of planning under control, and reduces the need to change plans completely when the unexpected occurs. As the stand and gate allocation plan updates have to be set up and updated while executing other activities, it is preferable for operators to develop plans that do not need to be continuously and entirely remade to avoid the increasing the workload, which, in turn, might increase the risk of making mistakes.

6.6.2 Creating and maintaining the flexibility of plans

The operators plan and re-plan to be able to face the unexpected using planning strategies that allow them to restructure plans in response to external changes. In fact, they plan to create and maintain the availability of slack resources such as space and

time, and re-plan to be able to face contingencies, while ensuring the availability of slack resources.

Operators ensure the availability of space that, for example, can be used to address an increase in the number of aircraft to park, planning the allocation of stands in such a way that at least one is kept free. RCT operators also develop plans to ensure there is an allowance for slack time between the boarding processes of flights assigned to the same gate, and between the departure and arrival of flights allocated to the same stand as this enables them to address, for example, delays in flight arrivals or in the execution of boarding and/or turnaround activities. It is worth noting that the operators determine the duration of the slack time, despite the organizational requirement, drawing, say, on their knowledge of the likely length of the delay and their knowledge of the time necessary for boarding by considering the number of passengers that must board, as the following extract from the ethnographic interviews collected during of the study show.

> The airport's protocols suggest maintaining 15 minutes of slack time between subsequent flights as a safety requirement, but the operators usually plan longer slack time to compensate for potential changes in flight arrivals or departures. In addition the operators change the amount of slack time based on their knowledge of the circumstances that impact on changes in the scheduled times. Thus, for example, they keep the duration of the slack time longer in winter, when the probability of delays increases due to weather conditions, and they decrease it in other seasons.

> You have to consider that in winter aircraft that move through airports in the north of Europe find snow and ice so it is likely that they arrive here with delays. We calculate at least 40 minutes in winter and 30 in the other seasons (Track 62 10/26/2011).

6.6.3 Creating and maintaining the margins of plans

The RCT operators' plan and re-plan to ensure the capability to deal with the unexpected needs to keep the plan margins in check, that is, to maintain control over the precariousness of plans. They do this mostly by developing plans to ensure the availability of ramp personnel and equipment over time. The possibility of dealing with changes in scheduled arrival and departure times, and of assisting unexpected flights

depends heavily on the availability of equipment and personnel necessary for assisting plane movements on the ground and executing handling activities. If, for example, unexpected planes arrive in the airport due to bad weather conditions, it is not enough to find a space to park them, but operators must also ensure that they will be handled and ready to reach their original destinations once cleared. In these cases it is not possible to rely on the possibility of having extra personnel; even airport equipment is a limited resource. Thus, RCT operators usually develop plans and re-plan to spare the personnel and the equipment at their disposal. The RCT operators succeed in doing this by minimizing the occasions that require personnel to move to the airside area, as well as reducing the distances that they have to cross, such as by allocating as many planes as possible to the parking areas next to the terminal building.

In this way, the RCT operators prevent ramp personnel being overloaded, which might affect the execution of plans and favor their availability for managing the unexpected. If the ramp personnel do not waste time on movement that can be avoided by planning, it is possible to use them to handle any unexpected planes as necessary, avoiding problems while assisting planes overall. This way of planning also reduces the need for ramp personnel to move equipment, preserving it from damage and favoring its availability over time. In addition, RCT operators spare resources by planning to favor the intensive use of gates that allow for boarding on foot. In this way, they favor both reduced use of airport resources, since boarding can be carried out without buses, and keep their use to the necessary minimum. As boarding on foot is quicker than boarding by bus, the intensive use of these gates allows for the sparing use of airport resources and ensures their availability when the unexpected occurs.

> OPERATOR The 6553 has an estimated delay of 30 minutes. They estimate that it will depart following a 30 minute delay because of a technical problem. It should arrive at 10, thereby overlapping with this plane.
>
> RESEARCHER But you have space so
>
> OPERATOR Yes, when I am sure about the delay I will move it. We will manage to find a gate with the boarding on foot (Track 69 11/02/2011).

In conclusion, it is worth noting that the airport's capacity to face unexpected changes in the time or number of flights depends on the adoption of all the planning practices described thus far, and that these planning practices make it possible to compensate for changes in the scheduled times and the number of incoming planes quite interchangeably. If, in fact, the operators have to park one unexpected plane whose arrival and departure time is certain, they can exploit the slack time between two subsequent flights; meanwhile, if it is not possible to compensate for the change of a scheduled flight using the slack time, the operators can use the slack space.

6.7 Discussion

Data analyzed thus far shows that planning in the RCT contributes to the organization's capability to handle disruptions because it helps maintain the airport's positive adjustments under challenging conditions, what organization studies calls 'organizational resilience'[12]. Organizational resilience is commonly recognized as relying upon a complex set of competences, processes, and structures that allow organizations to respond to change swiftly, and I contend here that planning fully belongs to these. Planning in the RCT, in fact, using Woods and Branlat's (2011) words, helps the airport escapes patterns of maladaptation such as the exhaustion of the organization's capacity to adapt to disturbances. Indeed, in the RCT, plans are set up to exploit material and human resources with the precise purpose of increasing the system's capacity to compensate for disturbances, such as changes in the number of flights and/or in their scheduled times, and of preventing the depletion of the airport's resources on which its functioning depends in the long run. Data thus suggests that not only are plans not brittle constructs that collapse in the face of unexpected events, but that they might play a key role in maintaining the organization's ability to adaptat to changing

[12] The term "resilience" is variously defined within organization studies (see: Weick and Sutcliffe, 2007; Vogus and Sutcliffe, 2007; Woods, 2006), allowing the study of different aspects of resilient organizations, such as how they eliminate errors and unexpected events, learn from events and near events, and reflect on their own capability to adapt to unexpected circumstances.

conditions. In particular the analyzed empirical materials show that by studying how the use of plans is related to the management of the unexpected, it is possible to understand how they contribute to managing the organization's slack resources, which is widely recognized as a key factor in ensuring the organizations' resilience. Vogus and Sutcliffe's (2007), for example, maintain that the organization's resilience depends primarily on the level of accumulated slack resources. But what emerges here is that organizations do not only need to store resources, but also to be able to dynamically create and maintain them over time using the available assets. Moreover the analysis presented beforehand shows that the understanding of organizations' resilience should not be informed only by the study of individuals' and groups' behavior as—among others—Bechky and Okhuysen (2011) indicate, but should focus on artifacts and the processes of their production and use as well, since this is necessary to unveil aspects of the management of the unexpected unidentifiable otherwise.

6.8 Concluding remarks

Data presented here indicate that planning could significantly contribute to the maintenance of the organizational adaptive capacity to address changing demands, which happens when—thanks to precise planning practices—plans are set up to compensate for unexpected events and to be changed when necessary. This analysis helps explain how plans might contribute to anticipating the unexpected, rather than how they might contribute to eliminating the unexpected (regarding the need to focus on both of these points, see: Vogus and Sutcliffe, 2007). Nevertheless, this work deserves attention for two main reasons. On the one hand, it helps researchers focus on how organizations deal with the unexpected that they cannot eliminate but at least partially anticipate; on the other hand, it creates the need to focus on artifacts and the processes of their production when studying organizations' resilience. But this work also makes it possible to empirically demonstrate that organization studies on organizations' ability to deal with the unexpected draw on conceptualizations of plans that are fraught with misconceptions about plans and that this risks building an understanding of

organizations' resilience on weak foundations. Similar considerations can be made looking at the CSCW studies which take for granted that, since plans cannot represent all the changing circumstances of their use, they cannot provide for them. Data here shows empirically that though this may happen, it is not always the case and it is not always necessary to know all the circumstances of the use of the plans, or to know them in all their concrete details, to be able to set up plans that can be used to address the unexpected in a quite precise way. By showing that organization' s dealing with the unexpected depends on plans' making it possible to reflexively relate the capability to solve contingent problems with the provision of the means and conditions that makes this possible over time, data shows that the usefulness of plans might reside in their making it possible to solve local problems by embodying the effort to confront known patterns of failure; in their working as connecting tools between local and more transcendental aspects of work and not only as abstract representations of actions, as Suchman (1987) would have it. Conceptualizing planning and re-planning as instructed actions helps us to understand this and conceive of plans not only as subject to temporary disturbances because of the occurrence of the unexpected, but as tools that might help reduce complexity and uncertainty.

I think that the analysis of planning reported here can contribute to the development of the theory of organizational resilience as Vogus and Sutcliffe (2007) hoped for. Yet I also think that this study might contribute to the growing corpus of CSCW studies oriented to understanding cooperative dynamics in the management of the unexpected (see among others Mendonça and Wallace, 2007; Palen and Vieweg, 2008; Paul and Reddy, 2010) as CSCW scholars have the theoretical and methodological tools necessary to do so.

7. Coordination-artifacts suiting: when plans are in the midst of ordering systems

Since the concept of instructed action helps researchers understand anticipating the relationship between courses of actions and their outcomes as a situated accomplishment, conceptualizing plans in terms of instructed actions encourages us to look at the capability of plans to anticipate events as a situated and practical accomplishment, and encourages us to look at the capability of plans to anticipate events as a situated and practical accomplishment brought about by the material aspects of the context of their set up and use, too. This understanding is particularly relevant for understanding how plans that need to continue to be working tools to function, that is, to understand what make them capable of determining in advance courses of action even in changing environments. This is why this chapter proposes conceptualizing the capacity of plans to anticipate interdependencies at work as an emergent, distributed, and artifact-mediated activity that might be uncovered by studying plans, planning and the application of plans as work objects and activities occurring within a multiplicity of coordinative artifacts and protocols. In doing so this chapter challenges the received understanding of the status of plans in cooperative work—that is, as artifacts whose capacity to anticipate future ways of performing activities is an immutable feature. This way it is possible to expand our understanding of how the capability of plans to anticipate courses of action, and therefore to support the coordination of work, is maintained in changing environments, and to support the efforts of designers of computer-supported cooperative work in designing CSCW systems.

7.1 Introduction

The objective of this chapter is to contribute to the understanding of the role of plans—that is, devices that "anticipate future ways of performing activities" (Bardram, 1997; p.

24)—in supporting coordination at work by proposing an approach that focuses on how the capacity of plans to anticipate interdependencies at work is maintained in the face of changes in surroundings to ensure stability in the coordination of different stakeholders. Several CSCW scholars (Bossen and Markussen, 2010; Button and Sharrock, 1998; Dant and Francis, 1998; Dourish, 2001b; Koskinen, 2000; Schmidt, 1999) have examined how the executors of plans deal with the anticipated courses of events that plans set up in real settings contributing significantly to the understanding of how plans are used within work settings. Yet, when taking plans as an object of inquiry, previous researchers have always considered them 'static artifacts' that one person develops and another has to use or, in other words, as artifacts whose capacity to define interdependencies in advance at work can never be changed by the plan executors. But what happens when plans change over time? Is it possible to conceptualize the plan's capacity to anticipate interdependencies among work activities as an emergent, distributed, and artifact-mediated activity that still ensures stability in the coordination of complex work activities? This is the research question that inspired this chapter. A question which this chapter aims to answer by focusing on how plans are used in combination with other artifacts, thus approaching the study of plans in a way that still needs to be exploited by CSCW scholars. To this end the concept of 'ordering system' developed by Schmidt and Wagner (2004) is particularly inspiring because it promotes the need to study specialized coordinative practices as essentially linked with coordinative artifacts, and to understand practices and artifacts as being designed to address very specific coordinative issues as interrelated, so that the study of work must include the understanding of the complex interconnections that actors establish to interrelate specific objects and practices to ensure order at work. Here I suggest that the term 'coordination-artifacts suiting' can be used to address the set of local practices and coordinative artifacts that permit individuals to keep plans on track—that is, to ensure the usability of plans over time despite changes in surroundings.

In order to develop this argument, the chapter first presents and comments on coordination-artifact studies and on research on plans and planning in CSCW to position the approach adopted here in relation to the study of plans and planning in current

research. It then goes into the analysis of the empirical materials collected in the RCT to conclude by providing insights into the design of CSCW systems.

7.2 Artifacts and work coordination

The preoccupation with coordination that is at the basis of CSCW research has fostered the study of how artifacts contribute to the realization of cooperative work. Schmidt and Simone's work (1996) is exemplar in this sense. Drawing on Strauss' work (1985), these scholars defined cooperative work as the kind of work "constituted by multiple actors who are interdependent in their work in that they interact through changing the state of the common field". They further defined articulation work as the means to "curb the distributed nature of complexly interdependent activities". Based on these definitions, they identified coordination mechanisms as:

> "Protocols encompassing a set of explicit conventions and prescribed procedures and supported by distinct artifacts with a standardized format, that stipulate and mediate the articulation of distributed activities so as to reduce the complexity of articulating distributed activities of cooperative ensembles" (Schmidt and Simone, 1996; pp. 16-21).

Artifacts therefore are related to coordination mechanisms as they "provide persistence to the precomputations of the protocol and to make them publicly available" (Schmidt and Simone, 1996; p. 35). Subsequently Schmidt and Wagner (2004) explored the concept of 'coordination mechanisms' and developed the concept of 'ordering systems' to address clusters of coordinative protocols and concomitant coordinative artifacts. In their study, they sought to overcome the biases that the study of coordination through the study of coordination mechanisms could engender, for example by stipulating a necessary correspondence between an artifact and a coordinative protocol (see Schmidt, 2011a; pp. 17-21) as well as outlining an approach that "supports the analyst in embracing the motley of coordinative practices required in highly complex cooperative work settings" (Schmidt, 2011a; p. 23). Other scholars have instead focused on the role of 'boundary objects' (Bowker and Star, 1999; Star, 2010) as material artifacts that mediate the relationships between different cooperating groups. These studies, focusing

on how objects mediate the relationship between different communities of practices, developed the concepts of 'prototypes' (Subrahmanian et al., 2003), 'intermediary objects' (Boujut and Blanco, 2003), 'boundary negotiating artifacts' (Lee, 2007), 'boundary-object trimming' (Bossen et al., 2014) and 'boundary objects as punctuated crystallizations' (Lutters and Ackerman, 2007). These studies have not only highlighted the functions of boundary objects in facilitating the crossing, pushing, and establishing of boundaries (Lee, 2007; p.333) and the role of objects in knowledge dynamics (Boujut and Blanco, 2003), but they have also—and most relevantly—introduced the study of how boundary objects are created and used within information flows. In other words, they have discussed the processes by which such objects are made progressively intelligible to members of the receiving communities. We draw these conceptualizations and put ourselves in the stream of research interested in studying the creation and management of coordination artifacts focusing on the change and crystallization of artifacts in unstable environments to understand the coordinative functions of plans. Among the studies quoted above, Bossen et al.'s study (2014) on boundary-object trimming is particularly inspiring because it stresses the dynamicity of work and highlights the kind of articulation work that might be necessary to keep coordination mechanisms on course when their "structural form and informational content need to be maintained and updated during their use" to ensure the smooth execution of work.

7.3 Plans, planning and re-planning

To date, several CSCW scholars have focused on how plans and planning are used in work settings focusing alternately on planning as a process and plans as artifacts. As explained in Chapter 2, focusing on plans and highlighting that actions are inevitably situated, in that they depend in essential ways upon the material and social circumstances of their occurrence, Suchman (1987) recognizes that the efficacy of plans inevitably depends on their relationship with the circumstances in which actions occur. Plans, in fact, cannot represent all the changing circumstances of their occurrence; thus, they should be considered 'weak resources' for the execution of actions, as their usefulness

depends only on their bringing "past experience and projected outcome to bear on our present actions" (Suchman, 1987; p. 185). This implies that, in order to get the work done well, it is necessary to deviate from the plan. Schmidt (2011b) criticizes Suchman's conceptualization of plans which, in his opinion, underestimates the normative dimension of plans and thus misrecognizes that plans can be used to provide criteria for whether or not a particular action is correctly executed, (2011b; p. 366) but he (1999) also demonstrates that plans do not necessarily determine our actions. The role of plans, in fact, depends on the extent to which it is possible to identify and model interdependencies in advance. In a similar vein, focusing on the use of workflow technology, Dourish (2001b; p. 52) highlights the role of plans as "organizational accounting devices". He, in fact, suggests that technologies that embody plans—that is, that impose predefined courses of actions—, can be used despite their failures in dealing with the improvised nature of work accomplishment (on this topic see, among others Suchman, 1983 and Bowers et al., 1995) because they render work activities "observable-and-reportable as being the activity they describe" (Dourish, 2001b; p. 55). In other words: plans might help explain work. Rönkkö et al. (2005; p. 433), instead argue for the need to study "the way plans become an accountable matter in organization activity" to understand how they help coordinate the development of work. By studying the articulation and coordination process around planning documentation, they show that plans are not necessarily used for prescribing courses of action, but that they can be used as organizational documents—that is, as a means to solve organizational problems and to ensure the execution of work. Meanwhile, other researchers show that plans do not themselves ensure that work is done in an orderly manner, but that such orderliness depends on everyday work. This means that efforts have to be made to deal with planned deadlines (Button and Sharrock, 1998), to give significance to formal plans within the situated rationality of social actions (Dant and Francis, 1998), or to make sense of work (Koskinen, 2000).

Focusing on planning, Bardram (1997) suggests that plans can be conceptualized as planning—that is, a situated activity, when the planning activity is enhanced by and simultaneously shapes the work activities. In such cases plan implementation allows for

the adjustment of the plan to the conditions of the specific situation. Similarly Bardram and Hansen (2010), and Munkvold et al. (2007) suggest considering planning a continuous activity necessary when it is impossible to anticipate every contingency that might arise in carrying out a series of tasks. This implies that the distinction between the planning phase and the execution phase fades, as planning never ends.

To summarize, it is possible to say that plans have mainly been studied as 'static artifacts' whose capacity to define interdependencies at work in advance can never be changed by the plan executors, so that it is important to understand how such artifacts are used by people who have to apply or carry them out. As such, plans have been shown to be useful resources that help execute planned activities when they adequately model interdependencies in advance, as is the case with checklists (see Schmidt, 1999), but also as inapt for supporting courses of action unless particular adaptive efforts devoted to matching the content of the plan with the real situation are made. When the focus of attention is on the process of planning instead, it is conceptualized as an adjustment to the concrete conditions of the context, and the relevance of plans as tools that might support the execution of action is minimized or even dismissed. In such cases, in fact, plans are conceptualized as trajectories that are the outcome of continual articulation work (see Munkvold et al. 2007). This demonstrates that plans are currently conceptualized as artifacts that inevitably fail to anticipate contingencies of work in that their ability to define courses of action in advance cannot be but defined once-for-all and, as a consequence, plans are never studied as changing but still capable of anticipating courses of action. Furthermore, the studies discussed thus far have been oriented to the study of these artifacts and processes in a disconnected manner from the other artifacts that inhabit organizational settings. Only Rönkkö et al. (2005) attempt to link the study of plans with other organizational documents, showing that members' reference to the project plan and the company-wide project models make it possible not to stop to orienting to plans, even as they do not work out, as this contributes to identifying deviations between the plan and the reality of a project. However, a systematic attempt to understand how plans work as coordination mechanisms when used in combination with other artifacts is still missing. All this suggests that the study

of plans is trapped by the aforementioned preconceptions and that it is necessary to get rid of them in order to expand our understanding of the use of plans within organizational settings. This is why the following paragraphs will address the study of the use of plans as interrelated with the use of other artifacts, and will ask whether the capacity of plans to anticipate courses of actions can be emergent and dynamic, more than a static affair.

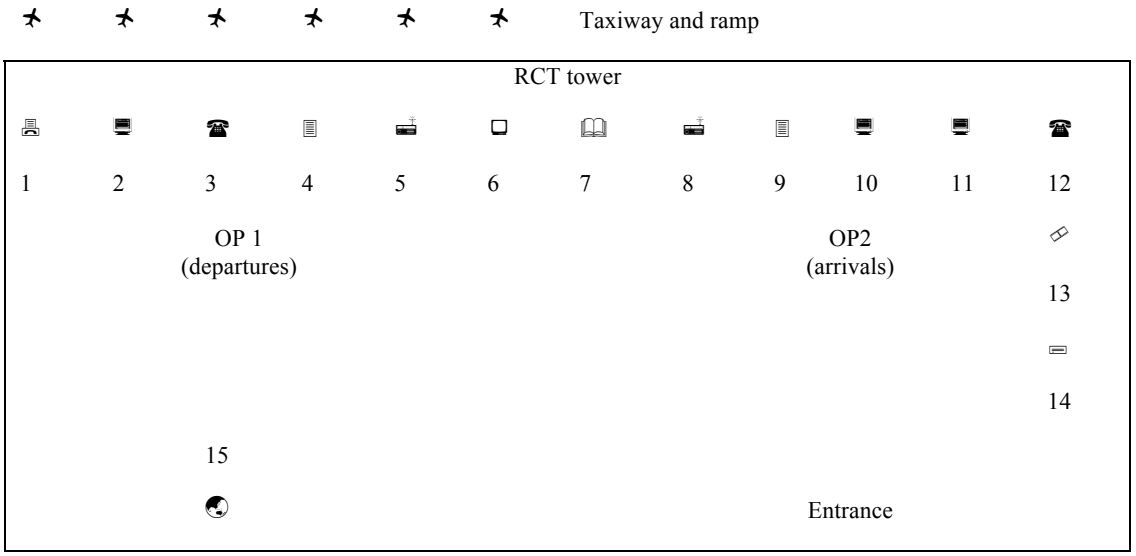
7.4 The RCT artifact landscape

As explained in Chapter 3, the RCT operators work in an environment full of artifacts that are variously available to both the operators at work. They have awareness tools, communication technologies, paper and electronic versions of the stand and gate allocation plans, and an information management system. The awareness tools include binoculars, a closed-circuit system for surveillance of the parking areas, but also a monitor showing the electronic strip-rack. The electronic strip rack offers various pieces of information regarding flights, such as the estimated block-off time (EOTB) and the calculated take-off time (CTOT) for departing flights, which allows the operator to know at what time the flight is scheduled to depart and at what time the plane will actually depart. The strip rack also provides information about the flight status for incoming planes. These statuses change from inactive to active, radar, and landed, corresponding to the plane's approach to the airport. The strip-rack also provides different evaluations of the estimated time of arrival (ETA) so the closer the plane is to the airport, the more accurate and reliable the estimations of the arrival time are.

The communication technologies include radios and telephones for exchanging information with the personnel on the ramp and with air traffic control staff, a telex, and the information management system which enables the exchange of e-mails with airline companies, airports and all the other airport services. The information management system also allows for the storage of all the information connected with flight execution and the handling services provided.

The software for the allocation of gates allows the operator to have an overview of the gate allocations, which needs to be done manually, and to monitor the number of passengers boarded for each flight, while the software for the stand allocation is used as an aid for the allocation of stands. It also highlights mismatches in the allocation of stands when information about changes in the scheduled times or the numbers of planes is inserted into the information system and it enables the plan to be printed after its setup. Moreover the RCT operators use a big map of the airport on the wall that provides information on the technical features of stands.

Fig. 7.1: Layout of the RCT



LEGEND

Operator 1 workspace
1 Telex
2 Computer
3 Telephone
4 Gate allocation plan (paper version)
5 Radio

Operator 2 workspace
8 Radio
9 Stand allocation plan (paper version)
10 Gate allocation plan (electronic version)
11 Computer
12 Telephone
13 Closed circuit camera

Shared tools
6 Strip rack
7 Notebook
14 Printer
15 Airport map

7.5 Planning and re-planning in the apron tower

The RCT operators, like other operators involved in flight execution (see Harper and Hughes, 1993), are oriented to achieving a normal order of on-time arrivals and departures as prescribed by the flight schedule, and work "to maintain a consistent relationship between an order of events prescribed via the schedule and events at the local site" (Suchman's words, 2011; p. 27). They do this by adopting precise planning and re-planning practices when allocating stands and gates that they use to match the airport with the flight activities. As previously explained, the operators have to compensate for changes in the execution of flights or in the airlines' efforts to match planes and flights, but they also have to consider that changes in the plans might create disruptions in the execution of airport activities since both the stand and gate allocation plans are coordination mechanisms. Indeed, the stand and gate allocation plans are sent to all personnel involved in providing plane assistance on the ground and to airport personnel to ensure the convergence of ground personnel at stands and of airport personnel and passengers at gates. This means that events need to be anticipated because changes to the plans have to be made in advance to permit all the stakeholders involved to re-organize their own activities while avoiding disruptions to the execution of flights. This means that the RCT operators are bound to deal with conflicting exigencies and that plans are at the interface of this tension between stability and flexibility, but also that anticipating events for planning purposes is an everyday accomplishment; something that routinely happens in the RCT and that can be investigated focusing on the RCT operators' planning and re-planning practices.

7.5.1 Planning practices and the anticipation of events

In the planning phase the RCT operators are able to anticipate the occurrence of some events on the basis of their knowledge of 'how things usually go'. As a consequence, they are able to plan in order to provide resources to compensate for changes in flight execution and to ensure the execution of ground activities as planned. It might be said that the RCT operators plan for the 'likely case scenario', and to prevent delays.

The interviews indicated that RCT operators, unlike what Bardram and Hansen (2010) noted, do not plan based on the best-case scenario (i.e., all flights will be carried out as scheduled), but rather on the basis of their knowledge of how flights are usually executed. Thus, for example the operators set up the stand allocation plan, ensuring the availability of slack space, i.e. at least one free stand on the ramp, and of slack time between subsequent flights to compensate for changes in the number or timetable of flights. But the RCT operators not only plan to adapt to likely-to-occur changes in the execution of flights. In fact, on the basis of their knowledge of the impact that planning the use of stands and gates have on the timely execution of the ground activities, they also plan to prevent the occurrence of delays in the execution of flights thus contributing to their execution as planned. They do this planning to ensure the timely execution of handling activities—that is, by planning to avoid delays in the execution of boarding, favoring the exchanges of crews and allocating planes in order to avoid bottleneck situations. The operators avoid delays in executing boarding by maximizing the use of stands that allow boarding and disembarkation on foot, and by matching the gate dimensions with the number of passengers to board.

> All of us here know that you have to exploit as much as possible the stands that allow boarding and disembarkation on foot so we do not need to use busses and these procedures are carried out quicker than by bus. So, for example I assign the flights that depart first in the morning to those stands so that they will be free for subsequent flights. If I put there flights that depart late in the morning, then I block their use (Track 5 10/07/2011).

> With Sxxair we have to start boarding a long time before flight departure, so you need space to place for passengers; otherwise, you board 6 passengers and then you have to stop. This way, you do not gain time. So we have to avoid assigning crowded flights to gates that have small fingers (Track 36 10/25/2011).

The operators also plan in such a way as to shorten the time necessary to exchange crews (i.e., move from one plane to another).

> When we are looking at the rotation lists and we detect an aircraft change, we try to put the two planes next to each other so the crew will not take a long time to move from one plane to the other one. You know, the low cost companies do not provide vehicles for the crews to move on the ground, so if we do not do this it might take a long time for them to walk from one side of the ramp to the

> opposite one, increasing the risk of a delay in flight departure (Track 14 10/07/2011).

Moreover, the operators allocate planes and gates to avoid overlaps in the aircraft' and passengers' movement on the ground.

> This is another thing you have to keep in mind. If I assign the plane that departs first in the morning to gate 16 instead of 14, I risk having to stop boarding for stand 14 if the plane at stand 16 is ready to go. Stand 16, in fact, is self-maneuvring and its exit way overlaps with the path passengers use to reach stand 14 (Track 14 10/07/2011).

> If we cannot avoid using stand 24, we put the flight there that departs first because this stand has to be free as soon as possible. It is a pushback stand and it is on the exit way of all these other self-maneuvering stands. So if it is not free, we have to push back all the flights that, as a consequence, cannot leave the stands in self-maneuvering mode so we risk causing delays because we have few pushback tractors and we have to push all those planes that, early in the morning, depart almost at the same time (Track 37 10/14/2011).

These planning practices contribute to the execution of flights as planned in a significant way, even though they are not enough to compensate for changes in flight execution. The RCT operators are therefore forced to engage in re-planning.

7.5.2 Re-planning practices and the anticipation of events

Planning and re-planning are different activities because during planning the RCT operators can repeatedly change the allocations until they are satisfied—that is, until they think that the plans allow for the optimization of the use of airport resources and the orderly movement of planes on the ground.

> First, I assign stands to be sure that flights fit in them; then I cancel everything and I start assigning the crowded flights to the gates that allow boarding on foot, and I put the international flights on the other side next to the gates dedicated to international flights (Track 37 10/1472011).

As explained in the previous paragraph, this way the operators make the plans resistant to changes and changeable at the same time. The RCT operators' planning practices, in fact, while providing slack time between subsequent flights, reduce the need to re-plan, which is a costly activity for planners who have to re-plan while carrying out other activities. Moreover, changes in the allocation of stands and gates might disrupt airport

activities because, for example, passengers have to move from one gate to another; and airport operators have to make additional efforts to re-coordinate their activities according to this change. In addition, during re-planning it is more difficult to change plans while ensuring the optimization of resources as they do not have the possibility to use any stand or gate, but only one of those not in use at that moment or in the near future. Yet, changes to plans cannot always be avoided. Thus the operators have to recognize the need to change plans and decide how to change them in advance to ensure the smooth execution of flights and ground activities. The RCT operators do this according to shared discursive practices and the use of artifacts that emerge from analysis of the naturally occurring conversations between them. The transcripts analyzed here are translated from Italian. The following fragments represent routine talk within the RCT.

In the following transcript one of the two operators detects the need to change the stand and allocation plans and involves the colleague in the solution of the re-allocation problem.

Extract 1 (Track 18 11/25/2011)

1. FRANK It's too narrow for us here with the **4 7 0 6**
   [Looking at the stand allocation plan (electronic version)]
2. TINA Even there?
   [Inserting data into the database]
3. FRANK It's at 16. **4 8 8 6, 4 7 0 7** is it already there?
   [Looking at the stand allocation plan (electronic version)]
4. TINA *18* and *22* but it's inactive
   [Looking at the strip rack]
5. FRANK The **4 8 8 6** is already on the ground the **4 8 8 5**
   [Looking at the stand allocation plan (electronic version)]
6. TINA Yes_yes. The **4 7 0 7** is arriving *10* minutes ahead of time at 16
   [Looking at the strip rack]
7. FRANK Okay. Let's see, Tina, let's see
   [Looking at the stand allocation plan (electronic version)]
8. TINA Can we switch them with another flight?
   [Looking at Frank]
9. FRANK Not here, they're all full. 14 18 it should go at 13. Shall we change the gate immediately and put it at 13? It leaves at *19* and *50*. Can we take it easy? Let's change it
   [Looking at the stand allocation plan (electronic version)]
10. TINA We can wait until it goes on radar and then we'll decide
    [Looking at Frank]
11. FRANK Okay, let's wait until it goes radar and then we'll decide
    [Looking at Tina]
12. TINA Okay

[Any record]

13. FRANK But 13 is free. Let's check for another gate. Mh (13.0)
[Looking at the software (opening the gate allocation manager)]
14. TINA *14*, *15*
[Looking at the gate allocation plan]
15. FRANK No there is also *19*
[Looking at the software (manager of gate allocation)]
16. TINA But if the passengers are already at the gate it'll be a mess moving them
[Looking at Frank]
17. FRANK *16* they're already there, you are right, then *15*
[Looking at the software (manager of gate allocation)]
18. TINA *15* is the closest
[Any record]
19. FRANK *15* is the closest. So in the end we'll change it
[Any record]

As explained above, the stand and gate allocation plans are set up to ensure the availability of slack space and time so as to compensate for changes in flight execution. This means that not all the contingencies require changes to plans. The RCT operators detect the need to change the stand allocation plan because its representation as a Gantt's chart enables for the detection of the shortening of slack time between subsequent flights even before the activation of the alarm color code because that representation shows time in terms of space (extract 1, turn 1).

Once the operators detect the need to change the plans, they have to find a viable solution to the re-allocation problem. They re-allocate stands by both looking at the stand allocation plan and at the representation of the strip rack. This way, in fact, they are able to identify the free stands at their disposal (extract 1, turns 5 and 9) and to assess which planes might be moved from their original allocations. Planes that are already on the ground might be moved but this is a time consuming activity whose occurrence interferes with the movement of planes on the taxiway. This is why the operators solve re-allocation problems by changing the allocation of flights that are going to arrive. They select the plane to move on the basis of distance of the aircraft from the airport. Usually the farther, the better, as it is unlikely that the re-allocation will negatively impact the execution of ground activities. The operators assess the planes' positions by looking at the strip rack, and in particular by focusing on the status of flights (extract 1, turn 4). Inactive flights are the farthest away while the radar flights are closest to the ground.

Drawing on the information provided by the strip rack the RCT operators can also decide to postpone changing the plan until more reliable information about the time of arrival of planes is available (extract 1, turns 9, 10, 11). Usually, in fact, estimations of arrival time change as the plane approaches the airport, so it might be possible to discover that a re-allocation is no longer necessary. However, it might also be the case that the operators decide to use the slack time between subsequent flights to compensate for changes in scheduled flight time. To do this safely they check the strip-rack for estimates of arrival time that are increasingly accurate as the time passes to understand whether this might be possible. In addition they might use the statuses of flights as deadlines around which to organize their re-planning activity (extract 1, turn 11). Changing the flight status from 'inactive' to 'radar' is a way of balancing the RCT operators' concern for preserving the plan as it was set up as much as possible, with the need to inform the operators on the ground in time to avoid disruptions in the execution of ground activities. In particular the RCT operators consider 'inactive flights' as a sort of hypothesis only of how thing will go, while they consider the status 'radar' as highly reliable and as fixing the optimal deadline for re-planning. The 'radar' status occurring 30 minutes before the arrival of the plane enables changes to plans and the re-coordination of ground activities.

Once the RCT operators have re-allocated stands, they re-allocate gates if necessary. Similar to stand re-allocation, they need to know the availability of stands and the location of the elements to move, which in this case are the passengers. In fact, for the RCT operators it is important to know whether passengers are already at the gate or not in order to identify the usable gate closest to them so as to reduce to a minimum their movements and, as a result, the risk of creating disruptions.

The passengers' location can be monitored by looking at the software at their disposal for the allocation of gates. The operators, in fact, can check the foreseen boarding time to assess the presence of passengers at the gate and, on the basis of their knowledge of the airport structure and of the stands available at that moment, decide which is the least disruptive solution in the given circumstances (extract 1, turns 16, 17).

Moreover, the use of artifacts not only supports re-allocation when incoming flights change their scheduled times, but also supports the identification of delays in planes leaving the stands. As extract 2 shows, Freddy asks his colleague to check whether they might have problems at stand 31 since the plane is next to land and the plane previously assigned to that stand is still on the ground. It is, in fact, on the strip rack but not ready for departure.

Extract 2 (Track 66 11/04/2011)

1. FREDDY Check 31, does it fit?
   [Looking at strip rack]
2. MARK Maybe let's say maybe
   [Looking at the stand allocation plan (electronic version)]
3. FREDDY Maybe? (10.0) let's put this on ice
   [Looking at Mark]
4. MARK If it fits ok otherwise I see that there is the yellow air at 9 that we could put at 7 that is next to it. The red air (XX) is going to leave first, isn't it? it is still sixty
   [Looking at the software (boarding page surveillance)]

As an answer Mark (turn 4) shares with the colleague the back-up plan he thinks they could use just in case. He thinks that it should be possible to change allocations using stand 7 since the plane at that stand is going to leave. That plane having arrived ahead of time, has permitted the timely beginning of the boarding procedure that is still ongoing but almost finished because, as shown by the boarding page surveillance, only 60 passengers have not yet boarded.

Last but not least, even if during re-planning it is more difficult to change plans while ensuring the optimization of resources, this does not mean that the RCT operators do not make any effort to maintain the capability of plans to provide resources for further possible re-planning interventions, as the extract below shows.

Extract 3 (Track 37 11/09/2011)

1. ALAN The Stansted is bothering me. In any case there is a stand free
   [Looking at the strip rack]
2. TINA A stand free?
   [Looking at the stand allocation plan -electronic version-]
3. ALAN My 13 is free
   [Looking at the stand allocation plan -paper version-]
4. TINA Because there is 28 to move to 13. That won't do there, we have to use 13 or we should move this one down. Oh no this is 14. This one? No because it is the first one to leave. Can't we put something

there? This one? Let's move this Stansted. Oh no we can't. Guess what we can do? Move this one and this down there
[Moving the cursor on the stand allocation plan -electronic version-]

5. ALAN In fact I was moving it to 14, if possible
[Looking at Tina]
6. TINA Yes but what do you care? Oh yes let's have the disembarkation, let's do that. But at what time does that one leave though? *20* and *40*. And this will arrive at? *20* and *45*, no I cannot. No, why is that? Yes it fits. Okay let's put the **4 1 9 7** at 14. Then here at 13 we can put another flight. Let' s see. Otherwise we could have moved this one up and the other one down, you see? We could have put this one down and moved this one
[Moving the cursor on the electronic version of the stand allocation plan]

When re-planning, the RCT operators try to optimize the use of airport resources and to maintain the possibility of changing plans over time as much as possible. This means that very often for the operators the simplest solution—finding a free stand for an unexpected plane—is not the best solution even though this means changing several allocations to solve a single re-allocation problem (extract 3, turns 4, 6). In addition, due to the possibility of changing plans, optimizations in the use of airport resources that are impossible during set up might become viable over the course of the day. Again, the use of the representations of plans and of the strip rack plays a key role in these processes. In other words, the operators always 'tidy up' the plans to maintain them as optimal working tools for themselves and colleagues who follow them.

Extract 4 (Track 1 11/25/2011)

1. FRANK I'm moving the **8 7 8 6** that was at 14 to 13
[Changing the electronic version of the stand allocation plan]
2. LISA But
[Looking at the paper version of the stand allocation plan]
3. FRANK What?
[No record]
4. LISA This other one swaps. Can't we put this one closer to 16? (XX) The crew that has to board on 12 now is at 15 and then at 22 but now we have space here
[Looking at the stand allocation plan (paper version) and then pointing at the stand allocation plan (electronic version)]
5. FRANK At 12 well done
[Looking at the electronic version of the stand allocation plan]
6. LISA At 13
[No record]
7. FRANK Wait isn't it already at 13?
[Looking at the electronic version of the stand allocation plan]
8. LISA No here it is written at 11. It's departing as **4 5 6 1**
[Looking at the paper version of the stand allocation plan]

The paper and electronic versions of the stand allocation plan, in fact, representing the changes to the plan at different speeds (the electronic version is updated as new data are received and inserted into the system, while the paper version is updated by the operators during any re-allocation) give both an overview of the decisions made during planning (the paper version) and a picture of events in real time (the electronic version) thus enabling reviews of the plan and therefore the identification of areas for improvement that re-allocation has made possible (extract 4, turn 4). Different representations of the stand allocation plans allow for the evaluation of whether pre-planned solutions are still good enough and to crosscheck whether 'first glance sound solutions' are feasible or not thus avoiding mistakes in the re-allocation of stands (extract 4, turn 8).

7.6 Discussion

The RCT operators' work, similar to the work of other operators involved in flight execution, is bound by the requirements of the flight plan. Other researchers (Harper and Hughes, 1993; Suchman, 2011) have highlighted the kinds of efforts that operators have to make to execute the flight plan despite the occurrence of inevitable contingent events. This work does the same thing, focusing on the relationship between the coordination of ground activities and the execution of flight schedules as well as on the role of plans in this process. It shows that the stand and gate allocation plans are not only supposed to compensate for changes in the execution of flights, but also promote the execution of flights as expected. They reach this objective thanks to both to planning and re-planning practices oriented to the achievement of different outcomes. Planning is developed based on the implementation of preferred scenarios, such as the movement of aircraft on the ground, while re-planning is implemented based on 'what-if scenarios'—that is, the evaluation of possible consequences determined by changes to the plan. Yet despite these differences, both planning and re-planning are oriented to anticipating the course of events. Anticipation in the planning phase draws on operators' local knowledge (Randall et al., 1996) how flight schedules are changed and how ground activities are executed. Anticipation is characterized by two elements: it is oriented to ensuring slack

resources with which to deal with contingencies (at least a certain amount of them) and to the prevention of disruptions in the execution of planned activities. Re-planning, on the other hand, anticipates events successfully because it is carried out on the basis of detecting the need to re-plan in advance; it is oriented to the identification of successful solutions to emergent problems, and it is carried out in a timely manner regarding the execution of the ground activities it coordinates. These activities are possible because RCT operators can use a set of tools to support their execution. It is worth noting that the majority of these tools are not designed to support re-planning, but to monitor flight execution. Nevertheless, the RCT operators use the information provided by these tools and transform them into information useful for re-planning purposes. In particular, RCT operators transform data provided by the equipment in terms of changes in the timetable of scheduled flights, into data regarding the position of planes. Similarly, they exploit instruments developed to control ground activities (i.e., the CCC) and the functions provided by the software system for gate allocation to assess the position of passengers. In this way, they determine the availability of stands and gates and identify the elements on which it is possible to act to solve contingent problems. In addition, the operators use the information regarding flight status to fix the timing of re-planning, thereby reducing the occurrences of re-planning and avoiding disruptions in the execution of re-planned activities. Last but not least, the different representations of the same plan support the recursive optimization of the use of airport resources and maintaining the opportunity to change the plan over time, despite the recurring changes to its content that, in turn, ensure the reliability of the plans. This means that the successful use of the stand and gate allocation plans depends on the combined use of artifacts and on the deployment of local knowledge coupled with constant monitoring of the execution of the flight plan.

Anticipation is recognized as one of the features of plans that support coordination, but researchers still need to understand how anticipation for planning purposes is achieved in changing environments. Anticipation has also been seen as the Achilles' heel of plans in that they cannot foresee all contingencies ahead of time. Thus, when several changes occur, plans cannot do anything but fail to support the execution of courses of action. Data instead show that anticipation can be an emergent, distributed, and artifact-

mediated activity that, at the same time, does not undermine the possibility for plans to determine the actions of its users—namely, the RCT operators and the ground personnel. Anticipating events in the RCT is the product of a complex set of interrelated planning and re-planning practices supported by the use of a composite set of tools. This means that anticipation emerges as the outcome of complex interconnections established by RCT operators to interrelate specific objects and practices to ensure order at work. RCT operators' combined use of specialized coordinative artifacts is instrumental in maintaining anticipation. As a result, even when plans in the RCT change, they never cease to ensure stability in the coordination of complex work activities and they never cease to be used to pre-compute interdependencies during the allocation of stands and gates. Thus, even though anticipation depends on the use of different tools, it essentially draws on the use of the representations of plans.

This study suggests that it is possible to understand how plans can maintain their capability to anticipate events in changing environments by taking a precise analytical stance. Indeed, when we extend the analytical focus beyond the mere understanding of whether or to what extent plans determine action, to encompass understanding the relationship that plans have with all the artifacts that support the orderly accomplishment of work, we can understand how plans are kept on track despite the changes that might occur in work conditions.

This is why I think we should conceptualize the study of plans as part of ordering systems (Schmidt and Wagner, 2004)—that is, clusters of artifacts and practices necessary to ensure order at work. In our case, this refers to the tools and practices necessary to coordinate fligh execution with accomplishing ground activities. When we adopt this perspective, we can understand not only how consistency is maintained across distributed and interdependent activities, such as flight execution and ground activities, but also how ordering systems might support the maintenance of one of the artifacts in the cluster. Efforts to keep plans on track are referred to here in terms of 'coordination-artifact suiting'.

This definition of the kind of work that is necessary to prevent the deterioration of plans might be understood as echoing the concept of 'boundary-object trimming' developed by Bossen et al. (2014), but I contend here that these concepts are radically different. The study by Bossen et al., like this one, involved a group whose core task is the articulation of work necessary to keep an artifact on course, and coined the term 'boundary-object trimming' to address the kind of articulation work necessary for maintaining a boundary object. The term "coordination-artifact suiting", instead refers to both the participants' articulation work and the broader 'artifact's landscape' in which single artifacts are included for the dynamic maintenance of artifacts. In addition, the term 'coordination-artifacts suiting' refers to the prevention of artifacts going of use, while the concept 'boundary-object trimming' refers to the activities necessary to maintain optimal working tools which, according to Bossen et al., includes their orderly completion and registration. I argue here that the concept of 'coordination-artifact suiting' can be used as a descriptive and heuristic concept. In fact, the term 'coordination-artifact suiting' can be used to describe all the cases in which ensembles of coordinative artifacts and practices are functional to the dynamic maintenance of one or more coordination mechanisms belonging to a cluster. It can also work as a sensitizing concept in that it carries a precise methodological insight: that understanding how coordination artifact—whose information content needs to be changed during their use—are updated, requires expanding the analytical focus beyond the study of a single artifact.

7.7 Concluding remarks

This chapter shows that keeping plans on course requires anticipating events and solutions, that is, the detection of the need to re-plan, and of the elements on which to act, and changing the plans in due time. In the RCT this is made possible by adopting precise practices devoted to integrating the information provided by artifacts. Therefore on the one hand the chapter highlights that anticipation, which is the key feature of plans, can be conceptualized as a situated, dynamic and artifact-mediated activity and therefore the need to overcome the conceptualization of the capability of plans to define

courses of action in advance as defined once-and-for-all, which seems to be an unintended legacy of previous understanding of plans. On the other hand, it stresses the need to approach the study of plans as part of a system of artifacts; to study plans by focusing on how their use is interrelated with the set of coordinating artifacts that always inhabit complex work settings. In addition, the data analysis presented here suggests there is a need to continue the study of continuous planning, opened by the work of Bardram and Hansen (2010) and Munkvold et al. (2007) by studying cases in which continuous planning is associated with the possibility of having plans that can be used to progressively pre-compute interdependencies during both the planning and re-planning phases, as it requires approaching software design in different ways. Indeed, our findings, even though not oriented to the development of software, enable some reflections on how to design software to support anticipation as a cooperative and mediated activity. The study of plans as articulation artifacts, which has so far mostly highlighted the need to support users' opportunities to skip the prescriptions of the plan and monitor these deviations (also see Bardram, 1997; Bardram and Hansen, 2010; Rönkkö et al., 2005), cannot be applied to supporting RCT operators' planning work, because what plans prescribe needs to be dynamically determined. 'Awareness technologies', such as the strip rack, the software for gate allocation and boarding monitoring, and the CCC—providing information regarding work activities carried out in related and distributed settings (on the ground and in the flight control tower)—, play a key role in the operators' ability to anticipate events. However, they are not enough. All the information about the timing of events and positions of stakeholders is useless if it is not transformed into information about the possibility to act upon objects and persons to solve allocation problems. This is why it seems reasonable to suggest distributing meta-content such as alarm systems, what Cabitza and Simone (2012) call affordances, over the cluster of the available technologies, to permit the transformation of the provided information for planning purposes, that is, to help operators to both compute interdependencies and display the aspects of their activities that are relevant for colleagues—like highlighting the need to revise plans—, for the development of provisional solutions and their identification as such, for the assessment of the timing of

re-planning, for the evaluation of the appropriateness of solutions to allocation problems as necessary to address slack resources, and for the prevention of delays during both the planning and re-planning phases. In any case, despite the way in which anticipation work might be supported, this data analysis highlights the necessity of design or re-designing software paying attention to how this might interfere with possible 'coordination-artifact suiting' dynamics. For this reason I have argued here that the concept of 'coordination-artifact suiting', by focusing on the interplay of work practices and the use of tools for the dynamic change of artifact information content, might help CSCW scholars in their work, and I hope that other CSCW scholars will experiment this insight.

8. Re-planning: changing the information content of plans

This chapter shows how the information content of plans is decided upon when plans need to be changed by focusing on how instructions for re-planning are followed. In doing so it goes into the RCT operators' interactions and explains re-planning as an instructed action realized through membership categorization work. Indeed, this chapter shows that it is through talk and participants' orientation to the representations of the plan that the RCT operators succeed in using intersubjectively agreed-upon devices, namely membership categorization devices (MCDs), to make decisions about how to change the stand allocation plan while enacting the organization's instructions for re-planning. Therefore this chapter, by exploring re-planning as an instructably produced action, shows how re-planning is accomplished when plans cannot be allowed to stop working and explains the ability to anticipate the relationship between courses of actions and their projected outcomes as mediated by membership categorization work. It does so by focusing on how the RCT operators succeed in reducing the use of ramp vehicles as much as possible when re-allocating stands because this concern is understood as being part and parcel of the use of re-planning instruction in the RCT.

8.1 Introduction

Several research projects have thus far tackled the understanding of the role of plans in the orderly accomplishment and coordination of work within organizational settings (see among others Bardram, 1997; Schmidt, 1999; 2011b). This interest arose from the ethnomethodologically informed study carried out by Suchman (1987) who worked on understanding the relationship between plans and actions and this, along with other EM-informed research (Zimmerman, 1971; Suchman, 1983; Button and Sharrock, 1996, Rönkkö et al., 2005), has contributed to understanding plans as tools that support

coordination and the orderly execution of work thanks to the interpretative work that plan executors engage in when applying them to the actual circumstances of use. Zimmerman (1971), for example, has shown that the orderly accomplishment of work depends on executing improvised practices devised to work in a planful manner, while Suchman (1983) unveiled the kind of efforts people have to engage in to implement plans in the course of actual work occurrences. Button and Sharrock (1996), on the other hand, have focused on the work that plan executors have to engage in to understand the meaning of the content of the plans while developing software. By highlighting that plans can be followed only by comparing the instructions they provide with actual occurrences at work, these studies have shown themselves to be inspired by Garfinkel's (1967) highlighting the "irremediable incompleteness of instructions"—his demonstration that the implementation of instructions is a problem of determining their meaning locally. As such, these EM-oriented research projects have provided relevant insights into the use of plans within organizational settings, but they have left what happens when plans need to be changed unexplained. So, even though Rönkkö et al. (2005) have tackled the study of re-planning by studying what happens when plans fail to work out, it is possible to say that re-planning has been underinvestigated. This is why this chapter goes into the study of how plans are changed to explain aspects of re-planning that have not yet been investigated, namely how re-planning is accomplished when plans are not permitted to stop working. To this end, plans are studied by drawing on Garfinkel's (2002) insights on instructed actions: as 'instructably produced' actions. In the past the concept of 'instructed action' was little used in EM studies of work (see Girton, 1986 and Lynch and Jordan, 1995), but more recently a growing number of studies have approached understanding the specificities of work by studying social interactions in light of this concept to unveil the role of instructions in the execution of work. Mondada (2013; 2014), for example, has used the concept of 'instructed action' to explain the organization of surgical practices as organized around the use of directives and on how they are achieved, while Lymer et al. (2014) has explained how diagnostic practices are re-instructed. Some research has focused on the role of embodied actions for doing instructional work (Lindwall and Ekström, 2012; Stukenbrock, 2012;

Mondada, 2009; Mondada, 2011; Mondada, 2013) while other research has investigated surgical training to understand how novices show their understanding of instructions (Hindmarsh et al. 2011) and the role of the instructees' repeating what has been shown to them in the construction of stable learning (Zemel and Koschmann, 2014). In general, the concept of 'instructed action' has been used to understand several of the activities that take place in healthcare and medical work (see Nishizaka, 2014; Hindmarsh, Hyland and Banerjee, 2014) and in various learning settings (see De Stefani and Gazin, 2014; Majlesi, 2014; Macbet, 2011) but no research has yet applied such a concept to the study of planning work. Really, little research has so far focused on planning work as interactional work. Only Stevanovic (Stevanovic, 2011; Stevanovic 2012a, 2012b, 2013, 2015; Stevanovic and Peräkylä, 2012; Stevanovic and Peräkylä, 2014) has addressed this topic in a systematic way, focusing on understanding how planners agree on who has the right to determine future actions. Unlike in previous research, the understanding of planning work is pursued here to pinpoint how the information content of the plans is changed. To this end the concept of 'instructed action' is used in the sense that this concept, by making it possible to conceptualize planning as the competent use of planning instructions (Amerine and Bilmes, 1988), makes it possible to access the practical skills through which decisions about changes in the content of plans are achieved. In fact, if plans are conceptualized as the outcome of the situated understanding of a set of instructions in the course of their being used, it is possible to focus on the means deployed by re-planners to enact organizational instructions for the production of a mutually recognizable re-planning result. This objective is pursued analyzing the data collected in the ramp control tower (RCT), the coordination center for handling activities on the ground of an Italian airport where planning and re-planning are recurring activities.

8.2 The setting

The operators who work in the RCT have to set up the plans for the allocation of the parking areas for aircraft, the stands, and gates, on daily basis. These plans need to

foresee where planes can stay once on the ground, and where passengers have to converge to go through boarding procedures. Anticipating the gate and stand allocations is of vital importance because it allows the personnel on the ramp and within the airport to organize and coordinate their work to ensure the orderly and timely execution of flights. In that sense these plans play a key role in the coordination of all airport activities. These plans are set up twice a day and are modified as a result of changes in flights schedules or to the availability of stands and gates. Focusing on the stand allocation plan, the RCT operators set it up individually and change it collegially through talk. Drawing on the information and communication technologies at their disposal the operators can monitor flight execution, for example they can understand if a flight's arrival is delayed or ahead of time, and therefore understand ahead of time whether the stand allocation plan needs to be modified. In fact, changes in the execution of scheduled flights might make it impossible to use the parking areas as planned. If, for example, a flight arrives ahead of time, the stand assigned to it could still be occupied by the plane previously assigned to that same parking area. In any case, whenever the stand allocation plan needs to be changed, the RCT operators have to make decisions about how to change it enacting the instructions imposed by the organization about the execution of handling with the purpose of ensuring the contained use of buses for passenger boarding and disembarkation to contribute to optimizing the airport resources for the timely assistance to planes on the ground. Moreover, when re-planning, the operators have to take into consideration the actual use of stands determined by decisions taken beforehand, and by the actual execution of flights. This means that each time the RCT operators face a re-planning problem they are confronted with the fact that this activity is situated in space and time, and that they have to work out the applicability of the organizational instructions locally in an intersubjectively acceptable way.

The RCT operators have to comply with two main requirements when re-planning: to match planes with stands, taking into consideration the dimensions of the planes and the technical features of the stands, and to ensure the fulfillment of security requirements regarding passenger boarding and disembarkation. The operators succeed in matching stands with planes by drawing on the electronic representation of the stand allocation

plan because it represents the stand plan in the form of a Gantt chart for the occupation of stands over time that highlights potential mismatches between the dimension of the stand and of the plane, as well as overlap between allocations for each stand in real time. On the other hand, the operators meet the security requirements when they ensure that passengers directed to non-Schengen countries like the United Kingdom are boarded by bus. Moreover, the operators are asked to ensure that the Airblue flights, national flights carried out by a specific airline, are boarded and disembarked using stand 22, which is linked with the gate by a jet bridge, and to reduce the walking distance for crew members who have to move from a plane that has arrived to a departing one once on the ground.

The RCT operators can help contain the use of the ramp vehicles by assigning stands to keep the use of buses for passenger transfer from the terminal building to planes and vice versa to a minimum. When doing this they have to take into account that most stands allow only for boarding and disembarking by bus, others allow only for boarding and disembarking on foot and others again allow for both boarding and disembarking either by bus or on foot. Practically, the RCT operators find a way to meet these requirements locally through their talk-in-interaction. Indeed, data shows that it is through talk and the use of the representations of the stand allocation plan at their disposal, the electronic and paper version, that the operators are able to identify the resources at their disposal for solving the re-allocation problem at hand and to identify and prioritize re-allocation solutions that become operative once communicated to all parties involved.

8.3 Approaching re-planning

How flights are coupled with stands during re-planning is understood by focusing on how the RCT operators use categorization devices. Membership categorization analysis (MCA), which has its origins in Sacks' (1972a, 1972b, 1992) work, was devised to access the way people use categories to identify and describe persons. Sacks, in fact, noticed that even if every single person could be described using different terms, i.e. a

man could be described as 'father', 'politician', 'husband' and so on, people's descriptions are made selectively on the basis of situational features. Approaching the study of talk by focusing on categorization devices is thus a way to access how the participants' common-sense knowledge of social structure is organized. Sacks worked to figure out the mechanisms that support the use of categories, and the emergence of inferences that their use permits, as the conceptual apparatus he has developed shows. In fact, he (Sacks, 1972a, 1972b) identified some of the mechanisms that are at the basis of the organization of membership categories, and a set of rules that apply to their use. Without repeating them entirely (see Chapter 4), the mechanisms of membership categorization work identified by Sacks relevant to the present discussion are those described as 'membership categorization devices' (MCDs) and as 'category bound activity' (CBA). The term MCD refers to the fact that categories are grouped to form collections:

> "Collections of membership categories, containing at least a category, which may be applied to some population containing at least one member, so as to provide, by the use of some rules of application, for the pairing of at least a population member and a categorization device member. A device is then a collection plus rules of application" (Sacks, 1972b p. 332).

This means that some membership categories are understood as aggregated while others not. The term CBA, on the other hand, refers to the activities that members of a specific MCD are expected to do and that are perceived as properly done as done by the members of that MCD.

> "Many activities are taken by members to be done by some particular or several particular categories of members where the categories are categories from membership categorization devices" (Sacks, LC1: 249).

Over time, several scholars have applied Sacks' insights to the study of non-conversational interactions (Watson, 1997) but also to advancing the study of turn-generated categories, that is, to link the study of the categorical and the sequential organization of talk. In this sense Housley (2002) and Housley and Fitzgerald's (2003) work is exemplary, but even more so Watson's work (1997) which, in Mondada's (2013) opinion, is recoverable in the more recent developments in CA studies on epistemics in

talk (Heritage 2012a, 2012b; 2013). The most relevan part of this research is the use of the MCA toolkit for understanding the use of non-personalized MCD, that is, for understanding the use of categories to describe objects. Exemplary work on this includes Schegloff's (1972) work on how MCDs are used to select the terms for the formulation of locations, but above all McHoul and Watson's study (1984) on how commonsense geographical knowledge is transformed into formally approved geographical knowledge in classroom talk. Another MCA development relevant for this work is Jayyusi's (1984) on the relationship between membership categorization work and morality as a practical matter. Jayyusi, in fact, was first to notice that the Sacksian analytic toolkit makes evident how commonsense knowledge is morally constituted.

> "Sacks' notion of category bound actions, rights and obligations not only points out the moral features of our category concepts, but also provides thus for the very moral accountability of certain actions and omissions … how knowledge is both morally constituted and constitutive of moral praxis" (Jayyusi, 1984; p.240)

Last but not least, this work is rooted in the EM understanding of MCA fostered by Hester and Eglin (1997)—that is, in understanding membership categorization as indexical in nature. From this perspective categories are not considered stable and culturally defined structures that people possess, but situated phenomena made recognizable by members' methodical procedures during their interactions. This implies, for example, that it is not possible to define once and for all which categories belong to a certain MCD, since categories are associated with MCD in an occasioned and contextual manner. Categories are contextualized and contextualizing at the same time. In Hester's opinion (1994), it is possible to conceptualize the use of categories and the context of their occurrence as mutually reliant.

> "Ethnomethodology refuses the idea that categories and the context of their occurrence are separated. This neither means that the context determines the use of categories nor that the context is independent of and external to categories; a sort of container that determines the categories' use… From the point of view of ethnomethodology, categories and their context inform each other and are not

> separable. For ethnomethodology the phenomenon of interest is not 'categories' within a 'context' but 'categories-in-context'" (Hester, 1994; p.230)[13].

In Hester's opinion (1994), categories are contextualized and contextualizing at the same time. The meaning of a category, whose understanding is a praxeological affair—that is, is worked out in the context of its use—, is made up of the use of elements of context, while the traits of context are brought into play by the use of categories. The speakers' use of categories, the setting and the social context co-selected by speakers are the resources at speakers' disposal to understand 'categories-in-context'.

MCA is used here to access how the operators' knowledge of the use of instruction for re-planning is organized and deployed in vivo.

8.4 Explaining planning as membership categorization work

Extract 1 (Track 1, 11/25/2011)

1. PAUL Without going so far you could have put this one at 16 so you could have disembarked on foot, you could have boarded this one at 16 with the buses because_ you_ should_ always_ board_ the_ extra_schengen_with_ the_ buses_ and you could have put this one at 14. You could have both disembarked and boarded it on foot
   [Pointing at the stand allocation plan -electronic version-]

What is this guy doing? Why is he talking about allocations of stands in terms of boarding and disembarkation procedures? How does this collection of accounts work as a justification of re-planning choices? I argue here that it is possible to answer these questions by applying MCA analytic tools to understanding how the RCT operators' technical knowledge is organized and deployed in the course of their daily work in order to apply the instructions imposed by the organization about the execution of re-planning work in situ while reducing the use of buses for passenger transfer as much as possible. To be more precise, it is possible to understand the RCT operator management of the allocations of stands during re-planning as organized around the creation of two standardized relational pairs (SRP)—that is, paired categories of types of flights and stands that need to go together.

[13] My translation.

Sacks (1972a, 1972b) coined the term 'SRP' to address a special type of MCD—the MCD that collects members that have reciprocal rights and obligations, such as spouses who help one another. This means that each party has standardized rights and obligations so that the absence of one of the party is a noticeable matter. This kind of absence, in fact, reveals the 'programmatic relevance' of the collection. Even though Sacks developed these concepts to explain the use of descriptions of people, I argue here that the same analytic toolkit can be applied to the study of non-personalized MCD in the course of planning in the RCT. In fact, explaining the activity of coupling stands and flights during re-planning in terms of creating SRPs means that the RCT operators match these elements on the basis of their recognizing that certain types of flights need to go with certain types of stands. In other words, the RCT operators create collections that have programmatic relevance in that the absence of one part of the pair is a noticeable matter, as the extract below shows.

Extract 2 (Track 60, 12/02/2011)

1 SCOTT I'm moving the departing Madrid that is at 24 to 14 to save the buses
[Typing at the keyboard]
2 SARAH Madrid at 24 with the buses?
[Turning to the electronic version of the stand allocation plan]
3 SCOTT Yes a rotation has been changed
[Typing at the keyboard]

Here Sarah's display of surprise (turn 2) when she hears that a Schengen flight has been allocated to a stand, 24, that does not allow for boarding on foot, reveals that when an allocation does not to occur with the expected other part of the pair, this is an observable matter.

Since any MCD carries with it certain expectable CBAs—that is, the predicates conventionally imputed to the members of a certain MCD, such as rights, obligations, entitlements, and so on, the RCT operators are able to couple flights with stands by showing that the selected stands have the CBAs properly expected by the members of the reference SRP. The SRPs which the RCT operators show themselves to be oriented to in the course of re-planning are two which, for analytic purposes, are labeled as

'Schengen SRP' and 'extra-Schengen SRP' and that have the CBAs listed in the table below.

Table 8.1: SRPs in use during re-planning

SRP	CBA	Flight Category	Stand Category
Schengen	To both board and disembark on foot	Being directed or coming from a country within the Schengen area	To permit boarding and disembarkation on foot
Extra-Schengen	To board by bus for departing flights To disembark on foot for incoming flights	Being directed or coming from a country outside of the Schengen area	To permit boarding by bus for departing flights To permit disembarkation on foot for incoming flights

As the table shows, these MCDs are not pre-defined collections that include fixed devices, be they flights or stands, but they are set up in situ by coupling the flights that need to be re-allocated with stands. In that way, they pre-exist talk in the sense that these MCDs "exist for the members" (Baker, 1997; p. 79). In other words, the MCA concept of SRP is used here to give an account of audible and visible aspects of the RCT operators' conduct at work, namely of the work of re-planning. They are used to explain how talk is organized and understood and, through that, how re-planning is accomplished in a recognizable way.

Such SRPs include flights properly tied with the other part of the pair, the stands, on the basis of specific types of rights and obligations. The two SRPs include different flights, distinguished based on their being executed within or outside the Schengen area. The status of flights in terms of being a Schengen or extra-Schengen flight might be explicitly stated or inferred by the city/airport of destination/provenance while the stands are identified by taking into consideration their availability and technical features. The availability of the stands is understood by looking at the representations of the plans, while knowledge of stands is expressed in terms of allowed or forbidden types of boarding and disembarkation procedures. The extra-Schengen SRP includes the

scheduled flights directed to or coming from countries that have not ratified the Schengen Agreement. They are coupled with stands to make boarding departing flights by bus and disembarking on foot for incoming flights possible. Looking at the extract below it is possible to see the RCT operators' orientation to such obligations (turn 1). Paul and Rose are cross-checking the information content of the paper and electronic versions of the stand allocation plan when they notice that they could have re-allocated a flight in a different way. Turn 1 shows Paul's idea of what should have been done. He clearly says that when they selected stand 16, they should have provided for boarding by bus for the departing extra-Schengen flight. Later on, on the other hand, they notice some inconsistencies between the two representations of the plan that Paul suggests they solve this by moving the incoming flight from Stansted to stand 14 to allow for disembarkation on foot (turns 6 and 7).

Extract 3 (Track 1, 11/25/2011)

1. PAUL Without going far you could have put this one at 16 so you could have disembarked on foot, you could have boarded this one at 16 with the buses because_ you_ should_ always_ board_ the_ extra_ schengen _with_ the_ buses and you could have put this one at 14. You could have both disembarked and boarded it on foot
   [Pointing at the stand allocation plan -electronic version-]
   …
2. ROSE [13 and the last]
   [Looking at the stand allocation plan -paper version-]
3. PAUL [The] stansted at 13
   [Looking at the stand allocation plan -electronic version-]
4. ROSE Yes but here it was originally assigned to 14. We can do that with gate *10* but 11 is written here instead of *10*
   [Looking at the stand allocation plan -paper version-]
5. PAUL Ok let's put that stansted at 14 so it disembarks on foot
   [Looking at the stand allocation plan -electronic version-]
6. ROSE Does it fit?
   [Looking at Paul]
7. PAUL Yes yes it fits, in case we'll move it again but with the buses but no it_ fits_ it_ fits
   [Looking at the stand allocation plan -electronic version-]

The 'Schengen SRP' includes the scheduled flights coming from or directed to countries that have ratified the Schengen Agreement and that are coupled with stands to have both boarding and disembarkation on foot, as the extract below shows.

Extract 4 (Track 1, 11/25/2011)

1. PAUL Madrid is at stand 9 with gate *15*
   [Looking at the stand allocation plan -paper version-]

2. ROSE In case since 14 has been fixed we could do this
   [Looking at the stand allocation plan -electronic version-]
3. PAUL Ah was 14 the one that wasn't working?
   [Turning to the stand allocation plan -electronic version-]
4. ROSE Yes, we can put madrid at 14
   [Looking at Paul]
5. PAUL Mh mh
   [Looking at the stand allocation plan -electronic version-]
6. ROSE So I can eliminate the buses it arrives and departs as a schengen flight let's see prague, it should fit prague as well (3.0) yes
   [Looking at the stand allocation plan -electronic version-]
7. PAUL Prague too?
   [Looking at the stand allocation plan -electronic version-]
8. ROSE Yes, let's put prague there too
   [Looking at the stand allocation plan -electronic version-]

The extract above shows the RTC operators' orientation to the Schengen SRP. In this kind of case, in fact, the operators move two flights to stand 14 as soon as it is re-opened to permit boarding and disembarkation on foot for some Schengen flights, thus reducing the use of buses for passenger transportation (turn 6).

Moreover, both the Schengen and extra-Schengen flights can be swapping flights, that is, flights whose crews need to move from one plane that has arrived to another departing one once on the ground. When flights have this kind of CBA, they need to be coupled with stands following the obligations described above, but also putting them as close as possible, that is, by assigning adjacent stands to them, as the extract below shows.

Extract 5 (Track 1, 11/25/2011)

1. ROSE Since bari is departing ahead of time I will move the one at 14 that swaps so the crew that will arrive at 16 will board nearby
   [Pointing at the stand allocation plan -electronic version-]
2. PAUL Which one?
3. *[Turning to the stand allocation plan -electronic version-]*
4. ROSE This one that arrives as Madrid and departs to lamezia we can_ also_ board_ and_ disembark_ two_ schengen_ flights_ on_ foot
5. *[Looking at Paul]*
6. PAUL yes great well done gate?
   [Looking at the stand allocation plan -electronic version-]

Here Rose and Paul agree on moving one swapping flight to stand 16 because departure ahead of time for the flight at stand 16 makes that stand available. That way they not only succeed in bringing two swapping flights closer, but also in having the boarding and disembarkation on foot for the Schengen flights that the re-allocated plane will carry out, since it is going to arrive from Madrid and depart for Lamezia (an Italian airport).

8.5 Membership categorization at work

The importance of using SRPs for re-planning resides in the fact that coupling flights with stands on the basis of the CBAs described above makes it possible to combine respecting organization instructions with the need to save buses at the same time, as the extract just commented on and reported below shows.

Extract 6 (Track 1, 11/25/2011)

1. ROSE Since bari is departing ahead of time I will move the one at 14 that swaps so the crew that will arrive at 16 will board nearby
   [Looking at the stand allocation plan -electronic version-]
2. PAUL Which one?
   [Turning to the stand allocation plan -electronic version-]
3. ROSE This one that arrives as Madrid and departs for lamezia we can_ also_ board_ and_ disembark_ two_ schengen_ flights_ on_ foot
   [Pointing to the stand allocation plan -electronic version-]
4. PAUL yes great well done gate?
   [Looking at the stand allocation plan -electronic version-]

Here, in fact, Paul assesses his colleague's proposal positively in that it allows them to both bring swapping flights closer and to reduce the use of buses for passengers transfer. But the reference to the SRPs plays a key role in the RCT operators' deciding which allocation is worth changing, or not changing, to solve situated re-allocation problems. Decisions about which flight to re-allocate, in fact, are made taking into consideration the necessity of preserving SRPs, as the extract below shows.

Extract 7 (Track 2, 10/19/2011)

1. MIKE Since that 21 remains on the ground
   [Looking at Tom]
2. TOM We move it
   [Turning to the electronic version of the stand allocation plan]
3. MIKE Yes. I know that it'll leave again later but I cannot use 22 if this one remains at 21 and I'd have to re-position all these Schengen flights which is impossible without using the buses
   [Looking at the electronic version of the stand allocation plan]
4. TOM Ok that plane is really getting on my nerves. At what time does it leave again? At *20* to *1* we need to inform the operative service that they have to organize the removal
   [Looking at the electronic version of the stand allocation plan]

In this case, the plane at stand 21 is remaining on the ground longer than expected due to a breakdown. Because of that it is impossible to use stand 22 because the presence of that plane impedes access for incoming flights to the next stand, 21. In this case the

operators can solve this problem either by deciding to move the plane out of stand 21, which is already on the ground, or by deciding to re-allocate the flights assigned to stand 22 that have yet to land. In this case they decide to move the plane on the ground, even though moving a plane on the ground is a complex activity to carry out when other planes need to use the taxi-way, and that requires coordination between several stakeholders, because it would be impossible to re-allocate all the Schengen flights assigned to stand 22, which allows for boarding and disembarkation on foot, without using buses, that is, by re-creating new SRPs.

Similarly the presence of swapping flights impacts on the decision of which flights to re-allocate because the operators not only approach planes that carry out swapping flights when re-planning, but they also avoid breaking SRPs that involve swapping flights, as the extract below shows.

Extract 8 (Track 2, 10/19/2011)

1. SCOTT Where **8 8 8 2** was? Ah it's here the gate is *19* perfect it doesn't change but we have to decide for another stand
   [Looking at the gate allocation plan -paper version-]
2. JOHN Moving the Brno?
   [Looking at the stand allocation plan -electronic version-]
3. SCOTT The Brno is on the previous page at 7 with gate *20* no it doesn't change because it swaps doesn't it?
   [Looking at the stand allocation plan -paper version-]

Here the operators need to find a new allocation for flight 8 8 8 2. John asks Scott whether they can solve that problem by re-allocating the Brno flight, but when the colleague finds the flight on the paper version of the stand allocation plan (turn 3) he is told that it is not possible to solve that problem by moving that flight since it is a swapping flight.

Moreover, the reference to the SRPs makes it possible to link the management of arriving and departing flights. During the day almost all the planes that carry out passenger flights depart immediately after having been handled. This means that the same plane might carry out both Schengen and extra-Schengen flights and that it might carry out Schengen and extra-Schengen flights one after the other as follows: one plane

might arrive as a Schengen flight, and depart as extra-Schengen flight, and vice versa. The reference to the SRP helps the operators allocate stands because when the same plane carries out different types of flights they try to allocate it to match the obligations to the different SRPs to which the plane sequentially belongs with the same allocation, as the extract below shows.

Extract 9 (Track 37, 11/08/2011)

1. ROSE Since this has a delay of around *50* minutes I'm moving the arriving stansted to 14
   [Looking at the stand allocation plan -electronic version-]
2. SCOTT Which one?
   [Turning to the stand allocation plan -electronic version-]
3. ROSE This one that arrives as **4 6 6 4** and then goes to Valencia we disembark on foot
   [Pointing to the stand allocation plan -electronic version-]
4. SCOTT Ok it disembarks and boards on foot
   [Looking at the stand allocation plan -electronic version-]
5. ROSE Yes exactly it arrives as **4 6 6 4** from stansted and leaves again as valencia
   [Looking at the stand allocation plan -electronic version-]

Here Rose is telling her colleague that she needs to change an allocation due to a flight delay. She suggests moving the incoming plane to stand 14 because that way it is possible to disembark the incoming Stansted, an extra-Schengen flight, on foot. The colleague, on his side, agrees and recognizes that that way it is even possible to board the Schengen flight that the same plane will carry out immediately after on foot.

8.6 Assessing the appropriateness of re-allocations

As the extracts presented in the previous paragraphs show, the solution to re-allocation problems might involve changing the allocation of one or several flights while still ensuring the construction of SRPs, or it might be achieved by coupling one single flight with one single stand, but the RCT operators could also be confronted with the need to change the allocation of flights even if they are not able to create the SRPs of reference. The technical features of stands, in fact, make it quite difficult to create Schengen SRPs

because there are fewer stands that allow for boarding and disembarkation on foot than those that allow for boarding and disembarkation by bus.

In other words, there are cases where the RCT operators need to re-plan without creating SRPs, or to prioritize the creation of SRPs, to make their re-planning interventions recognizable as having been done well. Even in such cases reference to SRPs is vital in that the RCT operators' accounting work shows that it is by referring to the SRPs that they can engage in the moral calculus necessary to show the rationality and adequacy of their choices under any circumstances.

First of all it is possible to notice that decisions about which SRPs to preserve and which can be sacrificed when re-planning are made using the Schengen SRP as a "positioned category" (Sacks, 1992 LC1/1974). Indeed, the Schengen SRP includes all the Airblue flights, which are always Schengen flights, as Airblue is a carrier that provides only national flights from that airport, which are recognized as having a higher position compared to the other Schengen flights because they are not only recognized as having the right to have boarding and disembarkation on foot at stand 22, as the organization requires, but also to keep this allocation as a priority. This makes it possible to make decisions about how to use stand 22. So, for example, the operators might assess negatively the fact that non-Airblue Schengen flights use the stand 22 if this means that it is not possible to use that stand for Airblue flights. As a consequence, they might be willing to accept removing non-Airblue Schengen flights from stand 22 to make space for an Airblue Schengen flight even at the cost of not being able to re-allocate the removed non-Airblue Schengen properly, as the extract below shows.

Extract 10 (Track 59, 12/02/2011)

1 SCOTT I saw that the airblue that is arriving today at *10* and *20* I saw that last night it has been decided to leave it out stand 22 perhaps because it has few passengers I don't know=
[Looking at the stand allocation plan -electronic version-]
2 SARAH =Are you moving it up?
[Turning to the stand allocation plan -electronic version-]
3 SCOTT Yes put the airblue at 22
[Looking at the stand allocation plan -electronic version-]
4 SARAH What did you want to move?
[Looking at the stand allocation plan -electronic version-]

5 SCOTT These two to 22. I'd put that one at 16 I'd put it. So airblue 22, that one is the? **8 8** four times **8** at 16 and that other one to a any faraway stand it doesn't matter (2.0) like 13
[Looking at the stand allocation plan -electronic version-]
6 *SARAH Mh*
[Any note]
7 SCOTT Which is the**? 6 4 5 2**
[Looking at the stand allocation plan -electronic version-]
8 SARAH **9 4 6 4** arriving as **6 4 5 2**
[Looking at the strip rack]
9 *SCOTT* Here at 13 with the buses
[Looking at the stand allocation plan -electronic version-]
10 SARAH OK the ciampino at 13. Let's check the departures
[Looking at the stand allocation plan -paper version-]
11 *SCOTT* Airblue (XX) **23 15** of the 2nd stand 22 gate 19 so it's ok
[In the meantime Tina answers a phone call. At the end of the call the conversation is re-started]
12 SCOTT Sarah?
[Looking at Sarah]
13 SARAH Yes?
[Turning to Scott]
14 SCOTT Then the other one
[Looking at Sarah]
15 SARAH Wait the krakow goes to 16 with *13* then the **9 4 6 4**
[Writing on the stand allocation plan -paper version-]

In this case Scott decides to move an Airblue flight to stand 22 since he has noticed that it has been assigned to a different stand for reasons that it is impossible for him to understand. What is worth noticing is that he does this re-allocation at the cost of re-allocating two other flights, the ones previously assigned to stand 22, which it is necessary to move to make space for the Airblue flight. It is also worth noting that to assign the Airblue flight to stand 22 he moves two Schengen flights, the one headed to Krakow that the plane moved to stand 16 will carry out after its arrival as the flight 8888 (turn 5, "the four times 8") and flight directed to Ciampino (an Italian airport). So, although stand 22 allows for both boarding and disembarkation on foot and the previously allocated flights are going to be carried out within the Schengen area, they are moved to make space for the Airblue flight. Moreover, they are moved at the cost of not being able to create two Schengen SRPs because it will be necessary to use buses to transport the passengers for the Ciampino (Schengen) flight (turn 9).

The reference to the CBAs of the SRPs of reference, on the other hand, helps the RCT operators decide how to re-allocate stands even if it is not possible for them to set up SRPs. The operators, in fact, when forced to re-plan without being able to create SRPs

account for their re-planning choices by showing that they have at least some of the expected CBAs, as the extract below shows. It is worth noting that the type of CBAs that can be skipped is decided locally, taking into consideration the actual conditions of work. So, even if Rob (see extract 12) decides to re-allocate swapping flights nearby, even at the cost of using buses for passenger transfer of a Schengen flight (Palermo), Sandra (see extract 13) decides to put swapping flights quite far away to solve the re-allocation problem quite easily and to have one disembarkation on foot because in her opinion the crew has plenty of time to cover quite a long walking distance.

Extract 11 (Track 63, 10/26/2011)

1. ROB I'm putting the **6 4 0 1** at 27
   [Typing at the keyboard]
2. BILL What? The palermo so far with the buses?
   [Looking at Rob]
3. ROB It swaps with this one at 26 I wanted to move this other one to make it on foot but I cannot
   [Pointing to stand allocation plan -electronic version-]

Extract 12 (Track 35, 10/08/2011)

1. SANDRA Since the **4 1 9 7** is delayed I'm moving it from 11 to 14
   [Looking at stand allocation plan -electronic version-]
2. PAUL The one that swaps?
   [Looking at stand allocation plan -electronic version-]
3. SANDRA Yes but after all it's a mess and we can't do it differently and then we can have the disembarkation on foot after all from 11 to 14 is not so different and the **4 2 9 8** arrives ahead of time so the crew has plenty of time to walk without bugging us
   [Looking at stand allocation plan -electronic version-]

In other words, the extracts above show that, given the actual conditions of work, the creation of SRPs is not possible, the re-allocations are decided and justified in terms of resembling the SRP of reference as much as possible.

Moreover, the reference to the CBAs is the basis of the possibility for the RCT operators to compare different ideas about ways of solving the same re-allocation problem. In fact, they compare their re-allocation hypothesis by explaining the CBAs that relate to their solutions to come up with a decision about what to do, as the extract below shows.

Extract 13 (Track 39, 11/08/2011)

1. ALAN Madrid has a delay it arrives at *12* and *05* I'm moving it to 13, if possible
   [Looking at stand allocation plan -electronic version-]
2. TINA It could fit at 16 as well and we could save one bus
   [Turning to the stand allocation plan -electronic version- and looking at it]
3. ALAN But it swaps with this one at 12 and it departs for Bristol which is in england right?
   [Looking at stand allocation plan -electronic version-]
4. TINA Ok 13 with the buses gate?
   [Looking at stand allocation plan -electronic version-]

Here Alan and Tina identify two possible solutions to the same re-allocation problems. Alan suggests re-allocating the flight that is coming from Madrid to stand 13 because its arrival is delayed. Tina, instead, suggests using another stand, 16, so they could disembark the Madrid flight on foot (turn 2). At this point Alan says that the same plane will depart again for Bristol, meaning that the use of stand 13, while not permitting the disembarkation of the Schengen flight from Madrid on foot, enables the use of the buses, which is necessary for managing the departing flight to Bristol, an extra-Schengen destination, as highlighted by his rhetorical question about the location of Bristol[14]. Moreover, he adds that that this is a swapping flight, thus justifying his allocation because it ensure the closest positioning of the plane arriving from Madrid with the corresponding swapping flight. At this point Tina accepts her colleague's proposal and asks him to identify a new gate for the departing flight to Bristol, which the change of the allocation of stands makes necessary.

This accounting work thus shows that the RCT operators solve re-allocation problems by engaging in a moral calculus aimed at answering the question "Which among these is the right solution?" and which they are able to answer by confronting the options available in terms of owned CBAs, so as to select the solution that has the largest number of desired CBAs. If, in fact, the CBAs owned by Alan and Tina's proposal are examined, it is clear that Alan's solution has more CBAs that Tina's.

[14] The term 'rethorical question' is used to describe a question designed not to elicit an answer but that, according to Han's (2002; p. 202), has "the illocutionary force of an assertion of the opposite polarity from what is apparently asked".

Table 8.2: Comparison of proposals

Tina's proposal	**Alan's proposal**
To have the disembarkation on foot for a Schengen flight	To have the boarding by bus of an extra-Schengen flight
	To have swapping flights nearby

Moreover, as the extract shows, stands are identified based on their making it possible to cumulate CBAs with reference to the identities of flights. Alan, in fact, selects stand 13 because, even though it does not ensure the creation of the SRP Schengen flight for the Madrid flight, it nevertheless ensures the right positioning of the departing flight that is a swapping extra-Schengen flight.

Last but not least, data shows that when the creation of SRPs is not possible, the RCT operators assess the rightness of their re-planning hypothesis by comparing them with the allocation solutions foreseen by the planners, as the extracts below show.

Extract 14 (Track 59, 12/02/2011)

1. SCOTT The **4 0 1 6** departing for hahn goes with stand 18 gate *16* on foot as before the **4 4 8 8** that departs for pescara at 14 so with the boarding and disembarkation on foot the **9 4 6 4** departing for ciampino that arrives as **6 5 5 2** is at 13 so it has boarding by bus.
   [Looking at the stand allocation plan -electronic version-]
2. SARAH Ok in the end we have only one more bus than before now I'll advise the boarding coordinator
   [Updating the stand allocation plan -paper version-]

Extract 15 (Track 31, 10/25/2011)

1. ALEX The pinkair arrives *20* minutes ahead of time
   [Looking at the stand allocation plan -electronic version-]
2. SCOTT Where are you putting it?
   [Turning to the stand allocation plan -electronic version-]
3. ALEX Eh, where can I put it? here it overlaps with that one, here it overlaps/let's move this one. **8 9 6 2** is it an outside the ue? (2.0) No ok let's move this one then. Let's see where we can put it (3.0) I' d put it at 13. Perfect. So I've changed the stand, we do not have problems because even before it had to use the buses
   [Looking at the stand allocation plan -electronic version-]
4. SCOTT Gate?
   [Bringing the gate allocation plan]

In extract 15 Scott is summarizing the changes they have made to solve a re-allocation problem. They have re-allocated three Schengen flights, two departing for national

airports (Pescara and Ciampino) and one departing for Germany (Hahn is a German airport). Two of these flights have been re-allocated to stands that allow for boarding and disembarkation on foot, while one does not. In any case, Sarah comments positively on the outcome of these re-allocations because in this way, they succeed in re-allocating the stands using only one more bus than before. In extract 16 on the other hand, Alex justifies his re-allocating a Schengen flight to a stand that does not allow for boarding on foot (turn 3) because that allocation would be as costly as the previous one in terms of the use of buses. This means that when re-allocating without being able to create SRPs, the RCT operators compare their re-allocation hypothesis with what was foreseen by the plan to identify the re-planning interventions that are as costly as or the least costly in terms of the use of airport resources compared to what had been pre-planned. In this case, the SRPs of reference also work as units of analysis around which it is possible to assess the rightness of each re-allocation intervention. In addition, this is coherent with the RCT operators' efforts to ameliorate plans by reducing the use of the airport's resources whenever possible by creating SRPs not foreseen by the plan (see, for example, extract 4 where the operators change the allocation of stands to create Schengen SRPs as soon as a stand is re-opened, thus reducing the use of buses).

8.7 Concluding remarks

This chapter goes into the study of how the information content of plans might be changed to explain aspects of re-planning that have not been investigated before. In fact, it shows both how re-planning is accomplished when plans are not permitted to stop working and explains re-planning as an instance of instructed action. Indeed, the chapter, by focusing on how decisions are made during re-planning, shows how the organization's instructions for accomplishing re-planning are enacted locally to change the stand allocation plan in a recognizable manner, that is, by ensuring a limited use of airport resources. The data analysis shows that the decision-making process necessary for changing this plan is made possible by the operators' referring to two types of MCDs, to which precise CBAs correspond, and through which they are able to couple

stands and flights. This way it explains re-planning as the outcome of membership categorization work and shows that the meaning of instructions is achieved locally and by relating instructions to one another. This chapter enriches EM-informed studies on how instructed actions are accomplished because it neither focuses on the sequential organization of paired actions 'instruction/instructed action' nor on the study of instructions through the use of directives that is the basis for several recent studies (among others see Mondada, 2014, Stukenbrock, 2014 and De Stefani and Gazin, 2014) but it interrelates the understanding of how instructions are used in the enactment of projected outcomes with membership categorization work. By doing so, this chapter promotes the need to approach the study of instructed actions by using methodological approaches that do not focus only on the sequential organization of talk.

Similar to previous research, this chapter investigates instructed actions as encompassing human interactions and the situated use of tools. By doing so it acknowledges the need to study instructions in ongoing situated courses of action as "complex multimodal gestalts, constituted by verbal and gestural/visible resources" as suggested by Mondada (2014; p. 138). Indeed, the adequacy of re-allocation in light of re-planning instructions would be left unexplained without studying the operators' talk, their orientation to artefacts, and how they use representations of the plan. In fact, it is by talking while being oriented to the representations of plans that RCT operators are able to engage in membership categorization work and, through it, to solve re-allocation problems. Membership categorization work and the use of artefacts are mutually elaborative because it is by inspecting the plans that the operators succeed in understanding the provenance and destinations of flights, thus being able to determine which SRP they belong to and therefore to orient the search for the other member of the pair. Moreover, it is by orienting to the representations of the plan that operators are able to identify the availability of stands for re-planning purposes in local work circumstances and therefore to couple them with flights. In addition, it is by orienting to the representations of the plan that the operators can intersubjectively assess the forwarded re-allocation hypothesis (see, for example extract 14). In fact, it is only by looking at the plans that the operators can check adherence to each proposed re-allocation with the corresponding

MCD and even to assess the appropriateness of suggested changes to the plan when SRPs cannot be composed. In other words, it is thanks to their interaction during re-planning, i.e. talk, orientation to artifacts, and the competent reading of them, that RCT operators can present and recognize suggested re-allocations as incumbents of the SRP of reference for having the category-bound activities that are properly expected of the members of that SRP, and that they can engage in the moral calculus necessary to understand whether or not the suggested re-allocations are good enough to be applied.

Therefore this chapter presents membership categorization work as the outcome of the reflexive intertwinement of body postures, talk, and the use of the material features of the setting. In fact, without the affordances that the representations of the plans provide in terms of the opportunity to identify flights and stands, MCDs could simply not be locally assembled. In that sense this chapter approaches the study of membership categorization work in quite an unusual way and advances the need to approach the study of membership categorization systematically so as to understand more about how the description of objects has an impact on the execution of work. In using the MCA toolkit for studying non-personalized MCDs, this work represents one of the few attempts made to transfer MCA into the realm of object descriptions. Indeed, only McHoul and Watson (1984) have attempted to apply MCA to the description of non-personalized MCDs. In doing this they noticed that this kind of transfer is possible when looking for relationships between MCDs and CBAs that are more general than those that characterize personalized MCDs. This conclusion is not confirmed by the analyzed data. Indeed, relationships between the MCDs and CBAs used in the RCT are well defined and fixed and it is precisely thanks to this that operators are able to couple stands with gates. In fact, it is by showing that stands have the CBAs properly expected by the members of the SRP of reference, that is, that they are proper incumbents (Watson, 1978) of the MCDs of reference, that the appropriateness of allocations is claimed or recognized. This might be because the kind of analytic work carried out here is different from that carried out by McHoul and Watson. In fact, they are concerned with the transformation of commonsense knowledge into formal knowledge, while here I have analyzed how professional knowledge is deployed, but it is possible that when

membership categorization work of non-personalized objects is scrutinized, it will be recognized that the kind of inferential work that MCDs make possible and the kind of relationship between MCDs and CBAs, have specific features that only further research might help understand.

To conclude, it is possible to say that this chapter, by focusing on participants' interactions, helps understand the way planning work is accomplished by explaining the possibility of anticipating the relationship between courses of action and the projected outcomes of instructions as mediated by membership categorization work. In that sense it helps shed light on the organization of professional knowledge and on its deployment in the situated circumstances of work.

9. Conclusion

The theme of this dissertation is the presentation of planning as an instance of instructed action—that is, as oriented to, and recognized as, the effort to anticipate actions while maintaining a consistent relationship between the instructions that regulate work and lived events. The terms 'plan' and 'planning' have thus been used here to address the artifacts and activities that the observed operators use to anticipate future ways of performing work, while the concept of 'instructed action' developed by Garfinkel (2002) has been used as an illuminating device—that is, to give an account of what happens during the RCT operators' planning and re-planning, and ultimately to understand cooperative work. Indeed, work coordination can be studied by looking at the kinds of interdependencies that exist among dependent subjects, and at how they are regulated as shown by the specificity of work practices. Applying the concept of instructed action to understanding planning is a novelty in CSCW studies of plan use and planning. In fact, within that community the study of plans has until now been carried out by understanding plans as instructions that, due to their indexical nature, need to be interpreted. In that sense, CSCW studies have tackled the study of plans on the basis of Suchman's (1987) describing plans as instructions. In fact, drawing on Garfinkel (1967), she understands plans as instructions and therefore as incomplete in that they do not and cannot provide accounts of the practical actions necessary to carry them out. Here, referring to the concept of 'instructed action' to explain planning, means drawing on Garfinkel's conceptualizing instructions as indexical to focus on the relationship between planning instructions, their projected outcomes, and the material conditions of action. This helps understand plans as the outcome of efforts oriented to the creation of accountable relationships between instructions and the material and contingent conditions of work, and understand the way instructions for planning are competently used to bring reality to anticipated ways of functioning of plans. As Rawls (2005; p. 178) notes, this kind of anticipations are vague until they are worked out and "the steps

necessary to enact them cannot be imagined until they are being done" but they are in any case relevant in that they make the attribution of meaning and coherence to sets of instructions possible. Focusing on plans as outcomes of instructed actions, instead of as instructions, has made it possible to notice aspects of planning that were previously neglected. In fact, by studying the operators' practices for deploying organization's instructions for the use of stands and gates, it was possible to understand that the usefulness of plans might reside not only in their normative dimension, as recognized by Schmidt (2011b), or in their abstracting uniformities across situations, as claimed by Suchman (1987), but also in their linking local and more transcendental aspects of work, such as the need to face patterns of organizational failure, and the maintenance of temporal coordination, as shown in Chapters 5 and 6. In fact, Chapter 6, focusing on the planning practices adopted to make the stand and gate allocation plans resistant to changes in the circumstances of their use, shows that the usefulness of plans lies in their being set up and changed to reflexively relate the solution of local problems to the effort to confront known patterns of failure over time, while Chapter 5 shows how instructions for planning are used to ensure the timely execution of work. Similarly, studying re-planning as instructed action (see Chapter 8) has made it possible to conceptualize it not only as a reaction to a plan's inability to work out, as Rönkkö et al. (2005) have done, but as the way to dynamically match the changing condition of work with desired ways of plans' function, and ultimately to show how plans are made to keep working. Chapter 8 engages in the study of planning as 'talk work' (Piccini, Carassa and Colombetti, 2006), unveiling aspects of planning unnoticed before, such as the kind of work that is necessary to change plan information content.

Moreover, being inspired by Garfinkel's (2002) suggesting the need to understand anticipation as a situated accomplishment, has allowed me to engage in the study of the capability of plans to anticipate events as an embodied and practical accomplishment achieved through the material aspects of the context of their setup and use. Indeed, being inspired by the concept of instructed action has permitted me conceptualize the capacity of plans to anticipate course of action as a dynamic accomplishment, in a way never done before within CSCW studies. In addition, this study, by confronting the analysis of

data with previous research, has permitted me to challenge some preconceptions in the study of plans and to advance the study of how instructed actions are interactionally accomplished. Indeed, as Chapter 5 shows, by focusing on the practices for the setup of plans, it is possible to demonstrate empirically that plans can work as adequate temporal coordination devices, thus contradicting the understanding of plans as devices that are difficult to use in the temporal coordination of work. Similarly, as Chapter 6 shows, by focusing on planning practices it is possible to challenge the understanding of the role of plans in managing the unexpected, which demonstrates that, contrary to what has been claimed by the major streams of research on organization resilience in the face of the unexpected, plans can play a role in retaining the organization's capacity to deal with unexpected events.

The combined use of ethnomethodology and MCA pursued in Chapter 8, on the other hand, has allowed me to engage in the study of re-planning as the outcome of membership categorization work. Coupling EM with MCA, in fact, by permitting the study of instruction-following in its actual accomplishment, and having access to the planners' accounting work, allows me to understand the planners' competency in executing instructed actions as manifested in the descriptions of objects. This way, the chapter represents a novelty in EM-oriented studies interested in understanding the interactional accomplishment of instructed actions because it approaches the study of instructed actions by focusing on the interactants' accounting work instead of looking at the sequential organization of interactions.

Yet, as explained in the introduction, I argue here that the main contribution of my research resides in having introduced a new way of understanding plans to the CSCW literature on plans and planning, that is, the understanding how plans are set up to embody planning purposes while executing planning instructions 'in vivo'. I contend here that the CSCW studies 'fixation' on understanding plans as instructions, while functional to the understanding of how prescriptive artifacts and technology —such as workflow systems— are used, does not make it possible to give an account of other types of cooperative dynamics that involve the use of plans, and that are the basis of the

orderly accomplishment of work, such as the way planning projects are brought to fruition and maintained. The other main contribution of this research is that it has approached the study of the capacity of plans to anticipate events as part and parcel of the coordinative artifacts and practices that inhabit complex work settings. While this may appear to be quite a trite statement for a research project oriented to the study of work as a situated accomplishment, it is astonishing to notice that no other research based on the study of planning looking at the 'whatness' of work has tried to understand the possibility of plans anticipating events as depending on the combined use of plans with other artifacts available to the operators at work. One suspects that, due to the emergence of the CSCW study of plans in the wake of Suchman's (1987) counteracting cognitivism, by focusing on plans whose capacity to anticipate actions is defined once and for all, has unreflectively led CSCW scholars to reiterate the study of plans from this perspective while scotomizing the study of the ability of plans to anticipate actions as a dynamic and complex artifact-mediated accomplishment.

In addition, this work reflects on the work of Suchman (2011) and Harper and Hughes (1993) studies on the enactment of flight schedule possible. Both Suchman and Harper and Hughes were oriented to understanding the relationship between the prescriptions of rules and the achievement of the normal order of work by showing the kind of work that air traffic control and ground personnel have to accomplish to ensure the normal order of flight execution as prescribed by schedules. In that sense they are no exception to the mainstream way of conceptualizing plans that is widespread within CSCW studies because they are oriented to unveiling the work that is needed to carry out flights in a planful manner. In fact, Harper and Hughes (1993; p. 129) highlight that the controllers' work is "saturated with the artful use of rules" more than with the unreflective application of procedures, while Suchman (2011) focuses on the use of flight schedules. In her work she stresses that schedules are used in flight management as "technologies of accountability" (Suchman, 2011, p. 27)—that is, as regimes to which to make actions accountable, but also as resources for organizing activities that require "unremarkable acts of improvisation" on the part of plan executors to be enacted. While noticing that in the observed airport schedules are used for managing ground activities as Suchman

describes because the RCT operators are seen to be constantly oriented to organizing handling to meet schedule requirements and to accomplish acts of improvisation to do this, here I contend that something lacks in this kind of description of ground control work. Data analyzed over the course of this dissertation, in fact, shows how the enactment of schedules depends on planning work. When, in fact, instructions for the plan setup and change are used by competent planners to meet the deadlines fixed by schedules, planning does play a role in the use of technologies of accountability. Conceptualizing plans in terms of instructed action thus makes it possible to account for a big part of the work of making flights executed as schedules, which had been left unexplained before, but also to avoid thinking that maintaining a consistent relationship between prescribed orders of events and local events depends exclusively on improvised actions. In summary, the data shows that if the use of prescriptive devices depends on acts of improvisation, their use depends on 'tendentious planning' as well—that is, on the use of planning instructions oriented to achieving the objective of schedules. Chapter 5 shows this clearly.

In the course of this dissertation suggestions for software design have been made as well. This has been done in Chapter 7 while discussing the process of 'coordination artifact suiting'. In that case I noticed that when the information content of an artifact such as a plan, needs to be constantly updated, and this is made possible by the integration of the data provided by different artifacts that have specialized uses, then software design should be carried out paying attention to possible interference with 'coordination-artifact suiting' dynamics. But references to software design have been done in Chapter 5 too, where it was stated that when planning is an instantiation of an instructed action, it is necessary to abandon the idea that software should merely support the identification of misapplication of the organization's requirements to engage in the design of software that supports the use of organizational instructions in accordance with the operators' visions for planning as well. It is suggested here that, in order to do this, software should be designed taking Garfinkel's (2002) noting the reflexive relationship between outcomes and the practice of following instructions into consideration.

> "One player doesn't go into the head of the other. Instead, he sees on face of the gesture everything that sense, aim, purpose, plan, and having something in mind, plainly or equivocally, for consisting of could look like" (Garfinkel, 2002; p. 211)

Since actions in the practice of following instructions show competent practitioners their sense, software should make it possible to make practitioners' moves comprehensible for the purposes that have determined their having been done (or not done) that way whenever competent practitioners acknowledge that equivocal interpretations might occur. In other words, software should support the process of recovering the sense of a planning action when this is hard to work out from the details of its accomplishment.

To conclude, it is possible to say that looking at planning in the RCT as an instructed action has made it possible to understand how the solution of coordination problems is related to the competent use of instructions for the plan setup and that this understanding would have been impossible without studying the operators' interactions and without understanding their interactions as cooperative in nature (see Tomasello, 2009; Clark, 1996). In fact, conceptualizing human interaction as cooperative makes it possible to access the human inference processes (Carassa and Colombetti, 2009) that, in turn, make instructed actions mutually intelligible. Therefore I contend here that this research, by having shown plans as the outcome of 'tendentious application of instructions' (Garfinkel, 2002; p.197) has helped:

> "Dismantle the common-sense conceptions of cooperative work, take them apart, unpack and disclose the hidden practices of articulation work, and thus give us access —analytically and conceptually— to the intricate ways and means of the production of social order in cooperative activities" (Schmidt, 2000; p. 145).

10. Bibliography

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11. Annex

11.1 List of tables and figures

Tables

Figures

11.2 Italian versions of the transcrips

Chapter 7

Extract 1 (Track 18 11/25/2011)

1. FRANK Siamo un po' stretti qua con la 4 7 0 6
   [Guardando il piano allocazione stand –versione elettronica-]
2. TINA Anche lì?
   [Inserendo data nel database]
3. FRANK E' al 16. 4 8 8 6, 4 7 0 7 ce l'abbiamo già lì?
   [Guardando il piano allocazione stand –versione elettronica-]
4. TINA 18 e 22 ma è inattiva
   [Guardando la strippiera]
5. FRANK La 4 8 8 6 è già atterrata la 4 8 8 5
   [Guardando il piano allocazione stand –versione elettronica-]
6. TINA Si_si. La 4 7 0 7 risulta arrivare 10 minuti prima al 16
   [Guardando la strippiera]
7. FRANK Va bene. Vediamo un po' Tina vediamo un po'
   [Guardando il piano allocazione stand –versione elettronica-]
8. TINA Riusciamo a girarli con un altro volo?
   [Guardando Frank]
9. FRANK Qua no, sono tutti pieni. 14 18 sarebbe da mettere al 13. Gli cambiamo già direttamente il gate e la mettiamo al 13? Parte alle 19 e 50. Vogliamo stare tranquilli? La cambiamo
   [Guardando il piano allocazione stand –versione elettronica-]
10. TINA Possiamo aspettare che diventi radar e poi decidere
    [Guardando Frank]
11. FRANK Dai facciamo così aspettiamo che diventi radar e poi decidiamo
    [Guardando Tina]
12. TINA Va bene
    [Nessuna nota]
13. FRANK Comunque il 13 è libero. Vediamo un gate alternativo (13.0) mh
    [Guardando il PC –software per la gestione dell'allocazione gate-]
14. TINA 14, 15
    [Guardando il piano allocazione gate]
15. FRANK No c'è anche il 19
    [Guardando il PC –software per la gestione dell'allocazione gate-]
16. TINA E ma se i passeggeri sono già al gate dobbiamo spostarli di brutto
    [Guardando Frank]
17. FRANK 16 sono lì hai ragione allora 15
    [Guardando il PC –software per la gestione dell'allocazione gate-]
18. TINA 15 è più vicino
    [Nessuna nota]
19. FRANK 15 è più vicino. Allora lo cambiamo alla fine
    [Nessuna nota]

Extract 2 (Track 66 11/04/2011)

1. FREDDY ma guarda il 31, ci sta?
   [Guardando la strippiera]
2. MARK Può essere. Diciamo may be 31

[Guardando il piano allocazione stand –versione elettronica-]

3. FREDDY May be? (10.0) Questo lo lasciamo in sospeso e poi lo guardiamo
   [Guardando Mark]
4. MARK Se ce la fa bene se no visto che c'è la yellow air al 9 la mettiamo al 7 lì accanto. La red air(XX) va via prima vero? E' arrivata un sacco presto. Ne mancano ancora 60
   [Guardando il PC –pagina di sorveglianza procedure di imbarco-]

Extract 3 (Track 37 11/09/2011)

1. ALAN C'è un po' lo Stanstead che mi dà fastidio. C'è un parcheggio libero tra l'altro
   [Guardando il piano allocazione stand –versione elettronica-]
2. TINA Come un parcheggio libero?
   [Guardando il piano allocazione stand –versione elettronica-]
3. A Il 13 mi rimane libero
   [Guardando il piano allocazione stand –versione cartacea-]
4. T Perché c'è il 28 da spostare al 13. Questo non va bene lì, bisogna utilizzare il 13 o questo lo spostiamo in giù. Ah no questo è il 14. Questo? No perché è il primo che va via. Non si riesce a mettere niente lì? Questo? Spostiamo questo Stanstead. Ah non si può. Sai cosa facciamo? Spostiamo questo qui, questo giù
   [Spostando il cursore sul piano allocazione stand –versione elettronica-]
5. A Infatti lo stavo spostando al 14 se riusciamo
   [Guardando Tina]
6. T Anche. Ma tanto cosa te ne frega? Ah si sbarchiamo, facciamo così. Questo a che ora va via però? 20 e 40 e questo arriva alle? 20 e 45 no non posso. No, come mai? Si ci sta ci sta va bene mettiamo al 14 la 4 1 9 7. Poi qua al 13 mettiamo un altro volo. Adesso vediamo. Se no potevamo spostarlo questo in su, quello in giù e quello in là capito? Questo qua lo mettevamo qui giù, questo lo spostavamo
   [Spostando il cursore sul piano allocazione stand –versione elettronica-]

Extract 4 (Track 1 11/25/2011)

1. FRANK Sto spostando la **8 7 8 6** che prima era al 14 al 13
   [Cambiando il piano allocazione stand –versione elettronica-]
2. LISA Ma
   [Guardando il piano allocazione stand –versione elettronica-]
3. FRANK Cosa?
   [Nessuna nota]
4. LISA Quest'altra swappa. Non si può avvicinare questo qui al 16? (XX) l'equipaggio che deve salire al 12 adesso è al 15 e poi al 22 ma c'è posto qua
   [Guardando il piano allocazione stand –versione cartacea- e poi indicando il piano allocazione stand –versione elettronica]
5. FRANK Al 12 bravissima si si
   [Guardando il piano allocazione stand –versione elettronica-]
6. *LISA* Al 13

[Nessuna nota]

7. *FRANK* Non è già giù al 13?
   [Guardando il piano allocazione stand –versione elettronica-]
8. LISA No, qui c'è scritto 11. In partenza è la **4 5 6 1**
   [Guardando il piano allocazione stand –versione elettronica-]

Chapter 8

Extract 1 (Track 1 11/25/2011)

1. PAUL Si, no potevi fare però se per restare vicino questa qua la mettevi al 16 e questa la sbarcavi a piedi, questa qua la imbarcavi al 16 sempre con gli autobus perché_la_devi_imbarcare_per_forza_con_gli_autobus_l'extra-schengen e questa qua la mettevi al 14. La sbarcavi sempre a piedi e imbarcavi sempre a piedi
   [Indicando il piano allocazione stand –versione elettronica-]

Extract 2 (Track 60 12/02/2011)

1. SCOTT Sto spostando il madrid che è al 24 al 14 per risprmiale i pulman
   [Digitando sulla tastiera del pc]
2. SARAH Il madrid al 24 con gli autobus?
   [Voltandosi verso il piano di allocazione stand –versione elettronica-]
3. SCOTT Si hanno cambiato una rotazione
   Digitando sulla tastiera del pc]

Extract 3 (Track 1 11/25/2011)

1. PAUL Si, no potevi fare però se per restare vicino questa qua la mettevi al 16 e questa la sbarcavi a piedi, questa qua la imbarcavi al 16 sempre con gli autobus perché_la_devi_imbarcare_per_forza_con_gli_autobus_l'extra-schengen e questa qua la mettevi al 14. La sbarcavi sempre a piedi e imbarcavi sempre a piedi
   [Indicando il piano allocazione stand –versione elettronica-]
   …
2. ROSE [il 13 e l'ultimo]
   [Guardando il piano allocazione stand –versione cartacea-]
3. PAUL [Lo] stansted al 13
   [Guardando il piano allocazione stand –versione elettronica-]
4. ROSE Esatto però ho qui era segnato in origine al 14. Riusciamo col gate 10 però qui c'è scritto 11 invece di 10
   [Guardando il piano allocazione stand –versione cartacea-]
5. PAUL Si dai, mettiamolo al 14 quello stansted così sbarca a piedi
   [Guardando il piano allocazione stand –versione elettronica-]
6. ROSE Ci sta?

[Guardando Paul]

7. PAUL Si si ci sta, eventualmente lo risposteremo ma con gli autobus no ma ci_sta_ci_sta
   [Guardando il piano allocazione stand –versione elettronica-]

Extract 4 (Track 1 11/25/2011)

1. PAUL Il Madrid è al parcheggio 9 col gate 15
   [Guardando il piano allocazione stand –versione cartacea-]
2. ROSE Ah volendo, visto che il 14 lo hanno riparato facciamo così
   [Guardando il piano allocazione stand –versione elettronica-]
3. PAUL ah era il 14 che non funzionava?
   [Voltandosi verso il piano allocazione stand –versione elettronica-]
4. ROSE Si, possiamo mettere il Madrid al 14
   [Guardando Paul]
5. PAUL Mh Mh
   [Guardando il piano allocazione stand –versione elettronica-]
6. ROSE Così elimino gli autobus arriva e riparte come schengen vediamo anche se il Praga, ci dovrebbe stare anche il Praga (3.0) si
   [Guardando il piano allocazione stand –versione elettronica-]
7. PAUL Anche il Praga?
   [Guardando il piano allocazione stand –versione elettronica-]
8. ROSE Si, mettiamo anche il Praga
   [Guardando il piano allocazione stand –versione elettronica-]

Extract 5 and 6 (Track 1 11/25/2011)

1. ROSE Visto che il bari sta partendo in anticipo sposto quello al 14 che swappa così l'equipaggio arriva al 16 e imbarca lì vicino
   [Guardando il piano allocazione stand –versione elettronica-]
2. PAUL Quale?
   [Voltandosi verso il piano allocazione stand –versione elettronica-]
3. ROSE Questo che arriva come madrid e riparte per Lamezia possiamo_ anche_ imbarcare_ e_ sbarcare_ due_ schengen_ a_ piedi
4. *[Indicando il piano allocazione stand –versione elettronica-]*
5. PAUL Si è vero ottimo gate?

Extract 7 (Track 2 10/19/2011)

1. MIKE Visto che ci resta a terra quella al 21
   [Guardando Tom]
2. TOM Si sposta
   [Entrando nella stanza e voltandosi verso il piano allocazione stand –versione elettronica-]
3. MIKE Bravo, lo so che riparte dopo ma io non riesco a usare il 22 se questo rimane al 21 e poi dovrei spostare tutti questi schengen senza i pulman ma è impossibile
   [Guardando il piano allocazione stand –versione elettronica-]

4. TOM Ok Ha già rotto questo aereo. A che ora riparte? A *20* alla *1* dobbiamo avvisare l'opertaivo per organizzare lo spostamento
   [Guardando il piano allocazione stand –versione elettronica-]

Extract 8 (Track 2 10/19/2011)

1. SCOTT **8 8 8 2** dov'era? Ah è qua il gate è il *19* perfetto non cambia ma dobbiamo decidere un altro parcheggio
   [Guardando il piano allocazione gate –versione cartacea-]
2. JOHN Spostando il brno?
   [Guardando il piano allocazione stand –versione elettronica-]
3. SCOTT Il Brno è alla pagina prima al 7 col gate *20* no non cambia perché questo swappa no?
   [Guardando il piano allocazione stand –versione cartacea-]

Extract 9 (Track 37 11/08/2011)

1. ROSE Visto che questo ha un ritardo di quasi *50* minuti sposto lo stansted che sta arrivando al 14
   [Guardando il piano allocazione stand –versione elettronica-]
2. SCOTT Quale?
   [Girandosi verso il piano allocazione stand –versione elettronica-]
3. ROSE Questo qua che arriva come **4 6 6 4** e che poi va a valenza lo sbarchiamo a piedi
   [Additando il piano allocazione stand –versione elettronica-]
4. SCOTT Ok sbarca e imbarca a piedi
   [Guardando il piano allocazione stand –versione elettronica-]
5. ROSE si esatto arriva come 4 6 6 4 da stansted e riparte come valenza
   [Guardando il piano allocazione stand –versione elettronica-]

Extract 10 (Track 59 12/02/2011)

1. SCOTT SCOTT Ho visto che la airblue che arriva oggi alle *10* e *20* ho visto che questa stanotte hanno fatto la scelta di lasciarlo fuori dallo stand 22 forse perché sono pochi i passeggeri non lo so=
   [Guardando il piano allocazione stand –versione elettronica-]
2. SARAH =Lo tiri su?
   [Girandosi verso il piano allocazione stand –versione elettronica-]
3. SCOTT Si metti l'aiblue al 22
   [Guardando il piano allocazione stand –versione elettronica-]
4. SARAH E cosa è che volevi spostare?
   [Guardando il piano allocazione stand –versione elettronica-]
5. SCOTT Queste due al 22. Metterei quella lì al 16 la metterei. Quindi Airblue 22, quella è la? **8 8** quattro volte **8** al 16 e quell'altra a un remoto qualunque che tanto (2.0)13 tipo
   [Guardando il piano allocazione stand –versione elettronica-]
6. SARAH Mh
   [Nessuna nota]
7. SCOTT Che è la? 6 4 5 2
   [Guardando il piano allocazione stand –versione elettronica-]
8. SARAH 9 4 6 4 in arrivo 6 4 5 2

[Guardando la strippiera]

9. SCOTT Qua al 13 con gli autobus
   [Guardando il piano allocazione stand –versione elettronica-]
10. SARAH Ok il ciampino al 13. Vediamo le partenze
    [Guardando il piano allocazione stand –versione cartacea-]
11. SCOTT Airblue (XX) **23 15** del 2 stand 22 gate 19 va già bene quindi è apposto
    [Nel frattempo Sara risponde al telefono. Al termine della telefonata la conversazione riprende]
12. SCOTT Sara?
    [Guardando Sarah]
13. SARAH Si?
    [Voltandosi verso Scott]
14. SCOTT Poi l'altra
    [Guardando Sarah]
15. SARAH Aspetta il Cracovia va al 16 col 13 poi la 9 4 6 4
    [Guardando il piano allocazione stand –versione elettronica-]

Extract 11 (Track 63 10/26/2011)

1. ROB Sto mettendo il 6 4 0 1 al 27
   [Digitando la tastiera del PC]
2. BILL Cosa? Il palermo così lontano con gli autobus?
   [Guardando Rob]
3. ROB Swappa volevo spostare quest'altro per fare a piedi ma non riesco
   [Guardando il piano allocazione stand –versione elettronica-]

Extract 12 (Track 35 10/08/2011)

1. SANDRA Visto che la **4 1 9 7** è in ritardo la sto spostando dall'11 al 14
   [Guardando il piano allocazione stand –versione elettronica-]
2. PAUL Quella che swappa?
   [Guardando il piano allocazione stand –versione elettronica-]
3. SANDRA Si ma d'altronde è un casino e non si riesce a fare diversamente e poi possiamo sbarcare a piedi dopo tutto dall' 11 al 14 non è che cambi molto e la **4 2 9 8** arriva prima perciò l'equipaggio ha tutto il tempo per farsi la strada a piedi senza rompere le scatole
   [Guardando il piano allocazione stand –versione elettronica-]

Extract 13 (Track 39 08/11/2011)

1. ALAN Il madrid è in ritardo arriva alle 12 e 05 lo sposto al 13 se riesco
   [Guardando il piano allocazione stand –versione elettronica-]
2. TINA Potrebbe starci anche al 16 e risparmieremmo un bus
   [Voltandosi verso il piano allocazione stand –versione elettronica- e guardandolo]
3. ALAN Si ma swappa con questo al 12 e riparte come bristol che è in inghlilterra giusto?
   [Guardando il piano allocazione stand –versione elettronica-]
4. TINA Ok 13 coi pulman gate?
   [Guardando il piano allocazione stand –versione elettronica-]

Extract 14 (Track 59 12/02/2011)

1. SCOTT La 4 0 1 6 in partenza per hahn va con lo stand 18 gate 16 a piedi come prima la 4 4 8 8 che va a pescara al 14 quindi con imbarco e sbarco a piedi la 9 4 6 4 in partenza per ciampino che arriva come 6 5 5 2 è al 13 con l'imbarco col pulman
   [Guardando il piano allocazione stand –versione elettronica-]
2. SARAH Va bene alla fine usiamo solo un pulman in più rispetto a prima adesso avviso il coordinatore imbarchi
   [Aggiornando il piano allocazione stand –versione elettronica-]

Extract 15 (Track 31 10/25/2011)

1. ALEX La pinkair arriva 20 minitu prima
   [Guardando il piano allocazione stand –versione elettronica-]
2. SCOTT Dove la stai mettendo?
   [Voltandosi verso il piano allocazione stand –versione elettronica-]
3. ALEX Eh dove la metto? Qua si accavalla con quella lì, qui si accavalla/spostiamo questa qua. 8 9 6 2 è un extra ue? (2.0) No, ok allora spostiamo questo qua. Vediamo dove possiamo metterlo (3.0) lo metto al 13. Perfetto. Allora ho cambiato il parcheggio, non abbiamo problemi perché anche prima dovevano fare con gli autobus
   [Guardando il piano allocazione stand –versione elettronica-]
4. SCOTT Gate?
   [Guardando il piano allocazione stand –versione elettronica-]