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Vincenzo D'Andrea
*Universita di Trento*, vincenzo.dandrea@unitn.it

Sandra Cattai
*Universita di Trento*, cattai@lii.unitn.it

Gianni Jacucci
*Universita di Trento*, jacucci@lii.unitn.it

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# A Case Study on Actor Roles in Systems Development

**Vincenzo D'Andrea**
Dipartimento di Informatica e Telecomunicazioni
Università di Trento
Via Sommarive 14, 38100
Trento, Italy
Vincenzo.DAndrea@unitn.it

**Sandra Cattai**
Dipartimento di Sociologia e Ricerca Sociale
Università di Trento
Via Verdi 8, 38100, Trento, Italy
Cattai@lii.unitn.it

**Gianni Jacucci**
Dipartimento di Sociologia e Ricerca Sociale
Università di Trento
Via Verdi 8, 38100, Trento, Italy
Jacucci@lii.unitn.it

**Abstract**

*The paper presents a reflection on the different actors roles in constructing a new technological system. The importance and the effects of active or passive user participation are discussed within two theoretical frameworks: Social Construction of Technology and Actor Network Theory. This paper describes an ethnographical observation on the development of a Customer Relationship Management system. During the development process, managers in the client organization seemed to only consider their own strategies, disregarding users' expectations. Which difficulties can arise when developing an information system in this way? The study presented in this paper tries to set the ground for answering this question, following the steps of the development of the information system and analysing the moments in which the different actors' strategies and ideas create unplanned situations.*

**Keywords**
Case study, participatory development, actor network theory.

## 1. Introduction

The purpose of this paper, that represents a work in progress, is to present an ethnographic study following the development process of a new information system in an organisation.
The general questions of interest are in our case related to the reasons for use or disposal of a system. Despite the difficulties encountered in finding them, the answers to such questions can be a key to a deeper understanding of the processes related to the development and implementation of a new technology.

A collaborative combination of different disciplines (e.g. information systems and social sciences) could help overcome the difficulties related to this kind of study, opening up the "black box" of technology.
Our work is related to the notion of "drifting technology", introduced by Ciborra (Ciborra, 1996), Ciborra define drift as a change of the role and function of the technology in the real use situation, as opposed to the planned ones. Our main focus is on the relationship between technology and its construction process, considering the perspectives of all the involved subjects.
A theoretical framework suitable to this approach is that of social constructivism. The Social Construction of Technology (Bijker et al., 1987) underlines the importance of studying the construction process from a clearly defined point of view. According to social constructivists, technologies are not built according to a linear development. Technological development is a social process of construction and negotiation. Bijker proposes descriptive model based on four elements: pertinent social groups identification, interpretative flexibility, closure and stabilisation. In this paper we will focus on the first two elements: underlining the definition and development process that occurs before the stabilisation of the system.
According to Bijker the artefact is made up of meanings assigned to the technological artefact by different social groups. The relevance of this interpretation was significant even from the first part of our research – different groups had different ideas on system definition and use. The fluid and variegated nature of the artefacts has the consequence that when a social group perceives a problem or a solution, the meaning of the artefact is modified. The sense attributed by a pertinent social group is in fact a component of the artefact itself, but it is not sufficient to consider only the social variables. The technical objects define the framework of action together with the actors, as suggested by the Actor Network Theory (Law, 1991). The importance of this perspective lies in the fact that people and technical objects are within a reciprocal definition process. Moreover, two notions of ANT are important for this work: inscription and translation. To simplify, the concept of inscription refers to the way technical artefacts embody patterns of use; while the notion of translation explains how artefacts become a result of negotiations between the involved subjects.
The framework described above can be considered as a theoretical lens used to study the empirical context of the research. The empirical field concerns a development project of an information system, where a workgroup in a development company was involved in the construction of the system for a client company.
The research methodology used during the empirical case is ethnography. The empirical material is collected trough participatory observations: the researcher actively participated, as a member of the development group, in the process of system development. The ethnography was carried out for two years, in order to follow the creation of the information system.

# 2. The case study

Customer Relationship Management (CRM) systems where recently recognized as having a central role in the world of Information Systems; a growing number of companies decided to adopt a CRM, or are considering to adopt one. On the research side there is a growing interest on CRM, see for instance the implementation of a CRM in IBM, described by Ciborra (1998).
Our case study concerns the process of the development of a tailored CRM system. CRM is generally defined as a system that uses the information about the customers and moves information 1) from the customer to the organisation, 2) inside the organisation, and 3) from the organisation to the customer (Baruchelli et al., 2001).

TheCRM system was developed by a workgroup of a company that we will call DevGroup. The work group is made up of a manager, some developers, an ethnographer, and the person responsible for the project. The system was developed for an enterprise operating in the printing and editing sector, here named PrintEdit; an organisation with more than 130 employees.
The ethnographical observation started from the first important contacts between the two organisations. The ethnographer followed most of the events concerning the work relationships between the two organisations. The role within the group leads to an especially subjective vision on work procedures. Several changes occurred during project development: involved people, organisations conditions and project objectives. The following is a brief history of the project.
The initial agreement was concerning the realisation of a complete CRM system for PrintEdit, implemented in all sectors of the organisation, connecting the different organisational functions. An additional request was to accompany CRM implementation with company reorganisation.
Despite that, following a critical period for PrintEdit and the consequent decision to concentrate on sales, it was decided to limit the system to the sales department only. The decision upon the construction of an enterprise-wide CRM system was postponed.
From DevGroup perspective the major change was not the different extension of the application, but the type of action required. Due to changes in management and company conditions, PrintEdit request limited to an information system. The step from considering organisational aspects, to delivering an information system for managers and sales staff made a significant change to the project.
While the initial intention was to involve the users in the development of the system, managerial decisions were an obstacle for the collaboration between DevGroup developers and PrintEdit users. Active involvement of the final users in the development was not possible. It was not possible for the developers to observe users work in order to understand current workpractices. PrintEdit managers did actually impose that relations between the two organisations took place through a single person. Rather than facilitating the relationships between users and developers, the role of the interface person was to 'represent' users towards developers.
The system was initially set up as a mock-up. A mock-up is an 'empty system', i.e. an interface presented to the user as a way to experience the system 'as if' it was fully working. Mock-up and prototypal system allow collaboration between developers and users.
Later, prototypes (partially working systems) were developed to collect feedback from the users. Prototypes, non-definitive parts of the system, can be considered non human actors (as suggested in ANT) that create the idea of CRM. The intermediate versions of the system were the result of social construction and actants that contributed to the realisation of the successive versions. Here the actors are the information system users, the developers, and the system itself. The main social groups are the final users (sales staff and management of PrintEdit), the managers of PrintEdit and the developers of DevGroup. These groups had different ideas of the future system – these ideas contributed to construct the system. In our work, we focus on the relationships between these actants (there is more to learn in observing relationships rather than observing only actors).
The first reflections on the project, accompanied by ethnographical observation are described below. The analysis of the empirical material is not yet completed.
The behaviour of PrintEdit management suggests that they believe in the linearity of the technology production process, in line with a description of the world in terms of strict scientific rationality. Due to the changes in PrintEdit the developers had to change a part of the system before the actual implementation. Organisational changes influenced the project, making it necessary to adjust the previous plan, despite the linearity belief.

Lack of interaction between the subjects of the two organisations caused several problems in the development of the system. DevGroup developers could not study the information system of PrintEdit. The developers had to make assumptions that determined a growth of the system not consistent with the situation present in PrintEdit.
Managers' objectives and strategies are inscribed into the technology. Managerial negotiations in PrintEdit led to the decision to develop a system that also had an objective of control. PrintEdit idea was to use the system for collecting all the information concerning the work of the sales staff. They asked for various reports based on information from sales staff, with the purpose of monitoring sales activities (earnings are proportional to amount of work). Sales staff was worried because they thought that the system could become a tool for increasing management control. The system could have been an opportunity to share the strategy and find an agreement between the different strategies. But, in this case, the system seems to become only an inscription of managerial imposition. The consequences of this non-democratic situation could have an unpredictable effect on the organisation and on the system.
Who are the actors? In our study we noticed that managers' requests are a result of their negotiations, ideas, belief and perceptions of the world. We also noticed that despite managers' prevention to users' participation, the users had a role in the definition of the system. In fact, final users can contribute to the success or to the failure of a system. They can informally negotiate their idea of the system with the management or they can communicate their unhappiness or unease in using the system as a potential tool for control.
As the system is not yet finished, we do not know if the system will become a tool for control, or a useful artefact for the sales staff. The developers' goal is to construct a system effective for both managers and sales, taking into account both ideas of the artefact.
What will happen when the system is finished and when the final users use the system?

# 3. The construction of the Information System

Users have the ability to modify technologies when they decide to use or not to use an artefact, as in Bijker's (Bijker, 1995) example of the social construction of a bike. Users also have the ability to modify technologies as suggested by Ciborra (Ciborra, 1996). The system can be changed into a concrete situation of usage through the use of technology in a different way from that inscribed in the system.
The meaning of an information system changes not only from organisation to organisation but also from person to person within an organisation. Different aims and needs lead to the realisation of different information systems.
In our case the idea of the CRM system was dynamic, it had original and specific characteristics. System objectives, needs and obstacles change between sectors and between users.
The assumption is that different interpretations influence the construction of an artefact. This consideration, also valid in the case of standardised artefacts changing in the moment of implementation from organisation to organisation, is especially valid for co-constructed systems.
During computer systems implementation, their introduction cause change into an organisation. Likewise, computer systems are not static entities, but rather systems that adapt as they are used (Greenbaum and Kyng, 1991). This is well explained by Ciborra (Ciborra, 1996) "drifting technology" concept.
Our case study suggests that drifting also happens before the actual implementation of the system. Modification gradually takes place while users and developers acquire knowledge and build the

technology. There is an evolution process of the software even before use. As the system gradually becomes real, expectations and requests from the user change and developers see the potentiality of technology in practice.

# 4. Conclusions

The changes from the initial agreements and conditions, observed during the development of the information system for PrintEdit were consequence of organisational strategies modification and of new personnel appointment. Nevertheless, the case study does show evidence that the process of technology co-construction occurs regardless of the subjects and group decisions.

The system is built and shaped around a set of meanings assigned to it by the subjects involved in the construction process. This interrelationship is not subject to formal decisions of the parties involved, but occurs regardless of their will.

In this paper we presented our perspective in the study of IT development in an organisation. The validity of the participatory methodology is our point of view in this empirical study. In our case study, it emerges once again that building an information system is a social process involving both the users and the developers.

We observe that despite the intent to exclude users from the development process, the system is a result of the social negotiations among developers, managers and users. While not formally involved, users' actions had several consequences in the development process.

We presented the problems encountered during traditional system development, as points of attention from a social constructivist perspective. Our reflection considers the different roles of the actors involved in the construction of a new information system.

Analysing the moments in which the different actors' strategies and ideas create unplanned situations, we highlight the difficulties encountered in the process we are studying. DevGroup has to face the difficulties in building a system despite the changes in the client organisations, trying to satisfy the requests of a client that assume a linear development process. At the same time, it was difficult for DevGroup to analyse the client organisation and collect all the needed information. Finally, there is a strong contradiction between PrintEdit managers' expectations and PrintEdit final users' expectations: this contradiction can have relevant consequences in the development and use of the system.

Our idea is that considering all the involved actors point of view it is possible to better understand the information system "identity". This identity is a result of the meaning given to the system by the different actors. The construction of the system identity is then a mutual and continuous process, whose complexity should be taken into account.

In this paper, we analysed the first part of this construction process. The complete analysis is still in progress, thus our conclusions are open to further evaluations of the topics emerged.

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