Abstract

Critiques in the Enterprise Modeling System (EMS) literature insist on addressing accuracy as a more or less satisfying gap filler between model and enterprise, i.e., between two disjointed spheres of knowledge, on the existence of which they create consensus: words and worlds, user know how and designer knowledge. Where does the accuracy of model knowledge come from, without having to assume these dichotomies a priory? We focus on knowledge mobilization processes enacted by Enterprise Modelling Systems. In our study, the concept of model accuracy is replaced by that of circulating reference, while the actor-network theory understanding of the model in action provides a non-singular view of the model. The adherence of EMS to enterprise knowledge is then seen to be enforced by the circulating reference of a multiplicity of intermediaries, who mobilize the model. The consensus on the adequacy of model representations is motivated by their use in the necessary mobilising and transfer of organisational data. The issue here is not that of investigating the relation of the model with the reference organisation as a fragment of the external world, but that of establishing whether the model represents the interests that made it possible and necessary.

Keywords: Enterprise Modelling Systems, Mobilization, Accountability.
1 INTRODUCTION

Enterprise Modelling Systems are acquiring ever greater relevance, in a cultural and institutional context of increasing need for enterprise auditing, as the State which intervenes directly in the market turns into a State which delegates market regulation to the private sector (La Spina & Majone 2000). To control this turn, the State acts via the institution of specific regulatory authorities. These authorities are committed to rule the action of private actors by the provision of regulations, whenever their action is considered ‘valuable for a community’ (Selznick 1985). Such regulations, being oriented to formulate internal control procedures in the form of monitoring techniques, participate to create what in anthropology has been defined an ‘audit culture’ (Strathern 2002). In this context, technologies are playing a key role. Michael Power, eminent scholar of audit studies, in his book ‘The Audit Explosion’ (1994), affirms that, among the peculiarities of audit culture, there is a turn to system accountability where technology is said to ensure a more ‘accurate’ performance. Recent US Congress regulation, calling for “sound and integrated information technology architectures” (CCA, Sec.2125) and “graphic representations” concerning changes in the financial condition of corporations (SOA, Sec.409), makes Enterprise Systems use in public corporations and governmental agencies an example of such monitoring techniques. Our field study is devoted to question the accuracy of Enterprise Modelling Systems (EMS) in mobilizing enterprise knowledge from the site of its production (the living organization) to the site of its elaboration into a model. In EMS literature (Crabtree et al. 2003, Ciborra and Associates 2000, Kallinikos 2004), the problem of how data moves from an enterprise to an enterprise-model has been resolved as a more or less satisfying accuracy relation between computer-based model and user performance. All these concerns denote consensus on a view of the situation where there exist two disjointed spheres (world and words, user know-how and designer knowledge) separated by a unique and radical gap, that must be reduced through the search for accuracy. Our contribution consists in demonstrating how accuracy is situationally attained in the field by understanding the knowledge mobilization process enacted by EMS, without creating conceptual dichotomies between user know-how and designer knowledge, or between an external world and the model as an explanation of it. The case presented invites to see adherence of enterprise models to the enterprise knowledge to be enforced by the internal accountability of a multiplicity of intermediaries, that mobilise enterprise knowledge, rather than to own properties of accuracy and objectivity of the models themselves. We report a field study carried out at the production site of an EMS – let us call it ‘EPISTEME’ - delivered by a software company headquartered in Scandinavia. The mobilization process is made accountable in a description of three scenes, recalling back, and including, all human and nonhuman actors involved. The paper is structured as follows. We first introduce our research question and theoretical framework. Then, we address research design and data source, followed by the results of the field study, represented in three scenes. Finally, discussion and conclusions are provided.

2 RESEARCH QUESTION

A number of preliminary interviews to Company managers and EPISTEME developers have been done starting January 2004, with the goal to get a grasp of how enterprise data actually move into the EPISTEME enterprise model. The interviews show that the first stage of the process of moving data from the living organization to a model, consists in a modeler accessing the organization. The modeler describes the access as follows:
“I enter a company, and I have a contact with a referent that gives me the data. The referent has a **limited knowledge**, that is **unstructured**. It is **tacit**.”

It seems at first bizarre that, in the same sentence, the modeler first credits the process of data gathering by the presence of a referent, and then he quickly discredits it, ascribing to that referent a ‘limited’, ‘tacit’ and ‘unstructured’ knowledge of his daily work practice.

Following step by step the itinerary of the ‘data’ from the site of collection to the site of the elaboration in EPISODE, we witnessed a series of attempts, all oriented to this goal: to create connections by which to access the organization to be modeled (referents, surveys, modeling approaches and presentations), and then, immediately after, to cut them out, nullify them, obliterate them. With the consequence of loosing memory of all passages accomplished, that would later allow to ask if the model appearing on the computer screen is an accurate and objective representation of the organization in which the data originated. The question addressed in this research is then the following one: where do objectivity and accuracy of model knowledge come from, if the data source is limited, tacit and unstructured?

Two dichotomies have to be overcome in order to describe how this question is solved in practice, as evident in the field: the one between an outside world and a model accurately representing it; and the one between a user unstructured knowledge and a modeller ‘superior’ knowledge.

The first dichotomy is overcome by the working hypothesis that model objectivity and accuracy should not to be measured in relation to the outside world mirrored by the model. It is instead an internal process of coherence, concerning a multiplicity of ‘inscriptions’ neither fully objective nor fully subjective (Latour 1999). Inscription is a general term referring to any type of transformation through which an entity materializes into a sign. In this case, the term inscription refers to each of the stages the enterprise data undergoes along the path towards being implemented into the EPISODE model. The living world of the organization, and the fully active system, are seen as the two extremes of the same chain of heterogeneous inscriptions. And the whole choreography of how the data moves from enterprise to enterprise-model, is seen as a mobilization process.

The second dichotomy is overcome by observing that, for us, the nature of the knowledge of the developer is not different from that of the referent. In fact, the know-how of the organization (represented by the referent) and the know-how of the model (represented by the modeller) both insist on the same world, and for this reason are both partial (Suchman 2000). What is specific to the mobilization process enacted by Enterprise Systems, is the increasing number of instruments and technology equipment in use. Up to scrutiny in this research is the accountability of the transformations between the many pairs of inscriptions that end up articulating an EPISODE model.

### 3 LITERATURE ON ENTERPRISE SYSTEMS

In ethnomethodology, phenomenology, and de-constructivism inspired studies of EMS, the problem of how data moves from an enterprise to an enterprise-model has been resolved as a more or less satisfying accuracy relation between computer-based model and user performance.

If ethnomethodology inspired studies of Business Process Re-Engineering maintain that ‘there is something missing’ in requirement specification (Crabtree et al. 2003, 2001, Calvey 1997, Twidale et al. 1992) – by ‘something’ meaning more detailed descriptions of the activities to be modelled -, phenomenologist scholars to their turn complain that ‘the higher conceptual detail’ of enterprise models ‘remained confined to the world of idealized abstractions’ and ‘has only a limited impact on the life worlds of business and organizations’ (Ciborra et al. 2000, Hanseth 2000). De-constructivists as well tend to see sets of ‘implicit organizational and behavioural premises onto which large scale

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1 Excerpt from interview with TT of 10-01-2004, Rovereto.
information packages such as ERP are built’ (Kallinikos 2004, 1999, Leigh Star 1996, 1999). The conclusions with these premises being that declarative knowledge and procedural knowledge tend to be rigidly separated by the application of ERP system and the procedural without the declarative degenerate in mechanistic and non-imaginative modes of acting and thinking.

The literature reviewed maintains that a model is either possible/impossible through the fulfillment/not-fulfillment of the gap between two disjointed spheres of knowledge: enterprise and enterprise-models, referents knowledge and modeller knowledge. Once produced in a model, the knowledge is ‘by nature’ different than before, when it was sparse in the organization. For this reason the two spheres can never communicate, either before or after accuracy ferries part of the enterprise knowledge, across the boundary of objectivity, into the model. The process of creating the alliances that form the basis of the construction of an EMS as a separate thing from the enterprise knowledge, remains poorly understood, because the use of the term accuracy wipes away any trace of the construction of this process, presenting it as a starting point. In the EMS literature, what is lacking is an approach that takes the dyadic opposition of enterprise-model vs. living enterprise as a final result instead of as a starting point. This, for us, is due to the insisting critique addressing accuracy as a more or less satisfying gap-filler between model and enterprise. For these critiques are nonetheless producing consensus on a view of the situation where there exist two disjointed spheres: world and words; user know-how and designer knowledge.

4 THEORETICAL FRAMEWORK

In the endeavour of avoiding the dualisms above, as a ready-made answer to our question, an alternative approach to the problem of how data moves from enterprise to enterprise-model is found in actor-network theory. The use of actor-network theory (Latour & Callon 1981) in the description of knowledge mobilization processes enacted by EMS make us maintain that the difference between model and enterprise knowledge is not due to their nature, but to a carefully arranged sequence of steps and movements that involve both parts (models and enterprises, referents and modellers) in negotiations and associations. Actor-network theory has never been really codified into a full fledged theory and it is better described as an interpretive sensitivity and a literary genre. The two sources of theoretical inspiration that can be detected in actor-network theory are: actant theory (Greimas and Courtés, 1982) and the notion of translation (Callon 1975). The main contribution of actor-network theory we make use of in our study, is the actant theory, a version of structuralist analysis introduced by the French semiologist Algirdas Greimas (Greimas and Courtés,1982). Greimas introduced the notion of narrative program: a change of state produced by any subject affecting any other subject. Greimas speaks of grammatical subjects, which may or may not reveal themselves as persons. Accordingly, he replaced the term ‘character’ with the term ‘actant’: “that which accomplishes or undergoes an act” (Greimas and Courtés, 1982) because it applies not only to human beings but also to animals, objects and concepts. Narrative programs become chained to one another in logical succession, thus forming a narrative trajectory. The schema of circulating reference (Latour 1999, p.70) is an adaptation of the greimasion narrative trajectory to the description of the making of technological objects. The schema of circulating reference applied to the problem of mobilizing data from enterprises to enterprise-models, replaces the gap between models and external world with the description of a carefully arranged sequence of steps and movements performed by a chain of inscriptions. The focus of attention then moves from a concern on the accuracy of the relation between an abstract user performance and a single modelling tool, to the warranties of the internal accountability of the two ways circulation between the final result – the world reduced to a model – and the initial state – the living world of the organization.
5 METHODOLOGY

The data collected in our field study is structured in a chain in which the observed internal accountability is the most important feature. In this chain, the succession of stages between three different frames of reference (the structures of interviews and two public presentations) is inquired in its traceability. The points of interruption of the chain are made apparent and set for further analysis. The concept of circulating reference maintains that knowledge of referent and knowledge of modellers in action are located on the same plane of reference, that is, they are not referring to some external world. A series of transformations is followed in this way, each of them implying a small gap between ‘form’ and ‘matter’. Reference, in this view, qualifies back and forth movement, as well as transformation’s quality. Each ring of the chain consists of the following components:

![Figure 1. A single ring of the chain of inscriptions](image)

The overall chain results as follows:

![Figure 2. The circulation of reference applied to our case](image)

Our inquiry is undertaken by focusing on the requirement specification phase of a European research project – let it be named ‘MINERVA’ - involving the R&D Unit of the Scandinavian software company where we conducted our field work of EPISTEME.

5 RESEARCH DESIGN AND DATA SOURCE

This research covers the requirement specification phase of project MINERVA. MINERVA deals with advanced technologies for the interoperability of heterogeneous networks and their applications. It involves a group of large European companies in the manufacturing field of aviation, automotive, telecommunication, as well as a number of software companies. Its goal is to progress towards a landscape of interoperability among different typologies of software in use in the industrial sector.

We have gained access to the requirement gathering activity of MINERVA within a longstanding collaboration of the Laboratory of Information Engineering of the University of Trento and the software company producing EPISME. In particular, a three months fieldwork has been conducted on the production site of EPISME from September to December 2004. Data/requirements came from interviews to personnel of the Product Business Unit and Research & Development Business Unit (BU) of the company, and to developers working in the R&D BU of the company, that participated in the requirement specification of MINERVA. During our fieldwork, we had the chance to discuss requirements, in the various steps of modelling, with developers working on them. Further data has been collected from the minutes of the meetings modellers had with industrial project partners providing use cases, and from the very deliverable documents of MINERVA. In the following we
describe a team of modellers travelling to one of the project industrial partners (a Greek telecommunication company) to gather ‘data’ to be implemented in models.

6 CASE DESCRIPTION

When asked about the requirement-data he has gathered, the modeler answers with a version of EPISTEME, where, by a multi-step method, the modeler has adapted the model to the modeled:

“The first step is called ‘proof of concept’ and consists in the conceptual simulation of what an enterprise architecture system could do in the specific case. The second is called ‘pre role-out’, that is a pilot test of the system, often carried with a minimum of data inserted in the model, or in a single area [of the organization]. The third is the ‘role-out’, that is that the system is fully active.”

We are in the phase of ‘proof of concept’ of MINERVA. The area under scrutiny is Product Portfolio Management. The organization, a Greek telecommunication company, involves in this activity the Product Manager and five other employees, with executive functions. These referents have the following roles: Business Unit Manager, Business Development Manager, Project Manager, Quality Engineer, Team Leader/Engineer and Product Manager. All these roles are to some extent related to the activity of Product Portfolio Management. With these representatives of the organization, five modellers are involved, deep in the work of acquiring data from them to later compose a model. Two modellers are busy interviewing, other two are taking notes, and one is ready to model in real time. The meetings of modellers and organization personnel take place in Lisbon and in Berlin, thousands of kilometres away from Athens, the Greek company headquarter. Only the final meeting will take place in Athens - when the data supplied by the Greek personnel will be already formulated in Power Point prototype model of EPISTEME. The case description provides an account of the process of mobilization of referents into more structured objects. We provide a description in three scenes of the mobilisation process and of the tools enabling it: text boxes, power point slides and pop-up effects. For each scene, we make apparent how the tools come situationally within carefully arranged choreographies. The passage throughout each scene and from scene to scene, once taken for granted in the dichotomic view of Enterprise Systems, is described in details. All the human and nonhuman actors involved in each scene are presented. The first scene describes how text boxes are the results of interviews taken by modellers in specific places and times. The second and the third scenes account for Power Point presentations of model prototypes within a setting, comprehending a description of audience selected and of speakers trained.

7 SCENE 1: THE STRUCTURE OF THE INTERVIEWS

As a first structuring step, EPISTEME structures unstructured knowledge with the structure of interviews. It is the first scene, more ‘silent’ than expected. The minutes of six interviews to the six managers are travelling from Lisbon and Berlin to Oslo and then to Athens. The hands of the expert modeller are quick on the keyboard to record the answers of the interviewees. Here is the structure of the interview:

<table>
<thead>
<tr>
<th>Structure of interview (part1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name and Position of the interviewee</td>
</tr>
<tr>
<td>Name of the interviewer</td>
</tr>
<tr>
<td>Date of the interview</td>
</tr>
</tbody>
</table>

Table 1. Interview minutes entries

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2 Excerpt from interview with the modeller TT of 10-01-2004, Rovereto.
The interview minutes structure has the preliminary advantage of not being noisy. Then, it has no place: the minutes structure has an entry for date, but not one for place. As if the distance of referent from reference (headquarter of the telecommunication firm in Athens) would be not relevant at all. Further, the structure has an algebra, a cardinal ordering:

Structure of the interview (part2)

<table>
<thead>
<tr>
<th>1. Start</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 What are your main activities in and around Product Portfolio Management (PMM)?</td>
</tr>
<tr>
<td>1.2 What are the other main activities regarding PMM from your point of view?</td>
</tr>
<tr>
<td>1.3 Are these activities described in formal corporate procedures?</td>
</tr>
<tr>
<td>1.4 What is the content of these description?</td>
</tr>
<tr>
<td>2. Process</td>
</tr>
<tr>
<td>2.1 Describe the main activities that you participate in.</td>
</tr>
</tbody>
</table>

Table 2. Interview cardinal ordering

The format of the interview minute structure consists of text boxes. Each question is enclosed in a grey text box, while the answer is enclosed in a white text box. In some interviews, all answers are written together in just one text box. In other cases some text boxes are left empty. Or the minutes are taken out of the boxes. None of the interview minutes fully respect the box order.

When it comes to describing ‘the main activities’, a double-entry table takes the place of plain text boxes. There are rows and columns: cardinal ordering turns into Cartesian ordering.

The organization represented by the six managers, interviewed someplace somewhere, reduced to minutes, not easily boxed in text boxes, ordered with cardinal numbers, now it is accommodated into a Cartesian diagram. In row, there is the list of the activities carried out by managers (e.g. system design, status of work checking, resource allocation, etc.). In column, there are the following entries: Description; Steps/sub-activities; When (after what) does it start (trigger); Information needed, who provides it (which Documents); Information produced and other results. Sent to whom?; Duration (How long does it take) and frequency (How often does this happen); People/roles participating, responsible; What IT tools are applied; How is the information/data formatted? (Forms and Templates).

Before model and modeller, before the modeller’s conceptual simulations, and the model implementation phase and ‘role-out’, we find a multiplicity of orderings: referents in flash and blood, real minutes, text boxes, and double-entry tables. This first scene contributes to answer the question: how many things the referent has been through, before a model?

We are just at the first of the stages through which the ‘limited’ referent’s knowledge becomes structured, and already we see it travel. How fragile it seems already all this! And we are not in Athens yet, to the final presentation named “model generated workplaces”\(^3\). For the time being, visibility, reliability, accountability, of such workplaces are not “model-generated”. They are generated by referents in flash and blood, by modellers, and by all the entities we have listed. From the minutes of the interviews to the six managers, to the overall view of how an organization can fulfil the right requirements to be fit into the model, there is still a long way to go. The fragile thread, on which a

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\(^3\) AA.VV., Analysis the Product Portfolio Management for Model Generated Work Places (MGWP), MINERVA Meeting, Plenary Session, 21th-25\(^{th}\) June 2004, Athens, Greece.
reference circulates back and forth, has still to endure a long way. The detailed description of all intermediaries is part of the solution.

8 SCENE 2: POWER POINT SLIDES

After having taken notice of the increased number of inscriptions encountered in describing the various orderings of interview structures, it is now possible to see how it all begins to fit together in a model. In the following last two scenes, we will encounter the model, in the dichotomic settlement of Enterprise Systems scholars seen as the ultimate form of enterprise knowledge, to become matter for further and more powerful representations. These further representations are Power Point presentations, in which the model is only a small fragment of the overall setting of the scene.

There is innovation here: rather than being perceived - the model - as an ultimate form of knowledge representation of enterprise knowledge, it is itself matter of a further, patent representation (a public presentation in Power Point). But now the model is not alone any more, also present there are: the modeler, with its rhetoric abilities; the users, well ‘configured’ having followed the entire process; the Power Point, with its static functionalities. These three actors together ‘can’ more than the model by itself.

In Scene 2 the modeller translates the referent knowledge into a prototype presented through Power Point slides. In Scene 3 the prototype comes just as a frame in a single slide of a plenary presentation. The power of such representation is measured by the overall setting of the scene of human and nonhuman actors within which it happens.

We aren’t in Athens yet. We are still stuck to a double-entry table, where the activities related to Product Portfolio Management are described. Each interview is drawing on the same questions. Following the cardinal ordering:

Structure of the interview (part3)

<table>
<thead>
<tr>
<th>3. MGWP (Model Generated Work)</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1 What are the main problems in the collaboration between you and your colleagues?</td>
</tr>
<tr>
<td>3.2 What are the consequences of these problems for your work and for the PPM in general?</td>
</tr>
<tr>
<td>3.3 In an ideal world, what would your workplace contain (e.g. services)?</td>
</tr>
<tr>
<td>3.4 How will these workplace services improve your work?</td>
</tr>
</tbody>
</table>

Table 3. Model Generated Work-Places

Modeller EG, interviewed on the MINERVA project, says that users had little fantasy in proposing an ‘ideal world’, where their workplace would solve all collaboration problems with workmates. The less unimaginative fellow is not accidentally the computer expert of the Greek telecommunication firm, the Team Leader Engineer. His answers to the structured interview focus on the wish of having a workplace where the different aspects of work for product development can be managed on the same integrated platform:

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4 Interview with the modeller EG, 12 October 2004, Oslo.
The best way is to have an integrated approach and a workplace with this sequence: write specification, create plan, assign engineer, fix bug (when they have the results) here or there, major revision...

Instead of having a single application for each of these tasks, the Team Leader wishes to have an integrated approach where all these operations can be carried out in one and the same system. The Team Leader complains about the applications existing in his workplace. Instead of being integrated, these treat separately the various aspects of the activity he performs in developing an IT product for his company:

- Outputs are Word docs and Visio drawings. Architectural descriptions are based on MS Office. Design reports are provided on MS Word.

The design reports are written in a Word application; with a modelling tool he represents the system specifics; with another editor he writes the code; on another platform he manages the feedbacks on the bugs. The series of changes of state reported in this paragraph, where at least four different totally independent computer based applications are involved, is rendered by modeller EG in a single Power Point slide:

![The EPISTEME interface](image)

**Figure 3. The EPISTEME interface**

This slide represents a screenshot, drawn from EPISTEME interface inside a window on a desktop computer, that intends to represent the Team Leader ‘Work-Place’, following his wishes, gathered in the answer to question 3.3 (In an ideal world, what would your workplace contain?).

For each element desired by the Team Leader, in the centre bottom of the screen there is the related box, distinguished from the background by a frame and a different colour.

The effect of a model generated integrated platform, where the different phases of product development can be monitored without quitting the application, is provided by one Power Point slide. To the left side of the screen there is a browsing system of folders and sub-folders. All the functionalities reported on the screen are drawn from a static picture of the potential result of the personalization of the workplace provided by EPISTEME.

There is an exception to the static view: the last four frames on the bottom line are links. These frames represent the different applications that the Team Leader said to use in order to accomplish the various phases of his activity. A hyper-textual link brings to the screenshot of the related application, and from the screenshot of the application back to the screenshot of the integrated platform. A link included in a Power Point presentation dissolves the effect of complexity of four applications embodied in a modelling system running on an operative system.

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5 Team leader, interview 22 June 2004.
6 Excerpt of Team Leader Interview, 22 June 2004
For reasons of space, for the sake of saving memory, for the sake of saving time, maybe even for technical reasons, the presentation is not done directly with the modelling system. It recalls the modelling system, yes, it insists on its existence. The potential of the modelling system remains indeed evoked. What one can rely on, but only in its evocative power, are various functions of a Power Point presentation. Of its many functions, one that is not secondary is the public nature of the presentation: it provides a ‘theatre of proofs’ (Latour 1986) in which the engineer is pointing to a picture on a big screen, showing the functionalities of the model in front of a public of users, a public that is re-presented inside the presentation as already having all the requirement to be part of it. The user is indeed passed, through referents, interviews, minutes, text boxes, double entry tables, to be a link in the screen picture of the modelling system in a Power Point presentation, a link representing with a smiling face on the picture each one of the managers involved. How this reduction is made possible, is described in the last scene.

9 SCENE 3: POP-UP EFFECTS

We are in Athens, at last, to the presentation of “model generated workplaces”. In this last presentation, the work done with EPISTEME on the Team Leader by modeller EG becomes a pop up effect of a single slide in another Power Point discourse. The discourse is that of the compatibility of the workplace view of the organization, with that of the managers, made out of standards and procedures to be followed, that she wants to control by navigation:

![Figure 4. A slide of the final presentation in Athens](image)

In the mock-up of Fig.4, the workplace view applies to Team Leader and to Quality Engineer, while the manager view above it refers to one of the two managers. Note that the mock-up has full functionality only for the button with link to the Team Leader, the other link button are dummies. Pushing this button, makes the workplace view of the Team Leader pop-up. In the mock-up representation, at each stage the functionality object being focus of the presentation gets reduced, and immersed in a greater number of dummy elements.

The six managers and the proofs of the minutes of their interviews have been reduced more and more to fit in the same Power Point presentation of the functionalities of the model. Let us trace back the chain of references: the reference of the presentation is the model; the reference of the model are the tables of the interviews; the references of the tables of the interviews are the minutes; the reference of the minutes are the lived voices of the same people that are sitting in front of the projected slide, with an effect of nearly completed compatibility.

The effect of compatibility of the target of the representation (the representatives of the Greek telecommunication firm) with the frame in the picture now becomes apparent. It is guaranteed by the very presence of the target of the representation sitting in front of the same modellers that did shoot the picture, that same people that are now pointing to that same picture.

Nothing but the model has been used at this stage, to make references travel and overlap.
The setting of the scene appears to be a “conceptual simulation” if just watching to the Power Point slide. But it is neither conceptual nor simulated at all, if one looks back to the very concrete paraphernalia of classification systems that made the data overlap. Second, modellers and referents are always the same people. The people who move to Athens are the same people that shoot the picture. The very target of the representation is sitting in front of the representation itself. These are the other means by which the problem of objectivity and accuracy of the model is secured. This is the answer to our question.

10 DISCUSSION AND CONCLUSIONS

We have seen an articulation in three scenes of the mechanism of grounding of the representative adequacy of the model. Purity and objectivity of representations derive from internal accountability, related to the transformative properties of the chain of intermediaries. In order to preserve objectivity along the chain of transformations, things must transform through translation processes, not remain unchanged. This means that representations do not have to match the external world, but by definition something else. ‘Something else’, that is ever more transformed in its complexity, as it undergoes more passages in the chain: this is the true origin and substance of ‘accuracy’ in this game. The more the things undergo transformations, the more they remain ‘equal’, and preserve themselves. This is the conclusion from our research, and it represents our contribution to this theoretical debate. Let us consider briefly the consequences of this state of affairs.

The Manager. As managers see increase their legal responsibilities, she currently intends to pass these on, to a ‘neutral’ enterprise modelling system - hence to the modeller - given their presumed social accountability. If the modelling system is found to be unreliable and cannot function in this accountability capacity, managers will stop purchasing it.

The Model. The model being involved in guarantee roles, e.g., as a governance solution, the accountability of all mediation passages is now the base for legal guarantee for the modeller.

The Modeller. The modeller is asked to demonstrate how his model accurately and respectfully represents the organisation, but she cannot. In fact, in order to satisfy the needs of knowledge transfer (with no change – translation -, no transfer is possible), she needs to deform this knowledge a bit in each passage. Good track must be then kept of all passages undergone.

The Researcher. As ‘the description of the chain of intermediaries is part of the solution’, the social science researcher contributes by detailing the description of the chain of passages, in a situation where the modeller has insufficient humanistic culture to do so, as by culture she most often sees things in an ‘objective way’.

The Enterprise. As intermediaries multiply, be them human or non-human, each of them requires an economic compensation, so that model revenues must be subdivided in all human and instrumental passage actors that constitute the essence of this model.

All these aspects warrant further investigation. The understanding of the transformative capability of the knowledge mobilization setting enacted by EMS, warrants a re-thinking of the idea of technology as monitoring systems of the activities of corporations and governmental organizations, to be employed as the baseline of audit cultures and institutional changes of our époque. The acknowledgement of the increased organizational complexity is of course a positive direction, as it is the idea that technologies as EMS can come through. To increase with a modelling tool the number of mediations through which enterprise knowledge can travel and be superimposed it is another promising direction. EMS are indeed able to involve in decision making much more entities than what can be possible by bare enterprise manager’s minds. It must be clear that for this, the internal mechanisms of accountability of the translations operated by the model have to be rethought accordingly.
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