

"Look! this is the future of cardiology": institutional work and the making of telemedicine in healthcare

Abstract. This paper seeks to offer a critical perspective on the lack of widespread adoption of telemonitoring. The paper proposes a reconstruction of the processes that led from the first experimental adoption to the final codification of the service as a clinical service, showing the complex ecology of actors, knowledge, practices that are necessary to inculcate new services into the institutional fabric. Adopting a qualitative research design, organizational processes are investigated through the conceptual lens of 'institutional work', defined as the creative and rationally oriented activity of 'culturally competent' actors aimed at adapting to dynamic conditions through which institutions are created, reproduced and destroyed. The work aims to show how different actors, using the resources at their disposal, act to modify healthcare institutions by redefining their role in a scenario characterized by an increasing use of ICT tools in healthcare. The fieldwork confirms how the institutionalization of change requires continuous "tuning" and its transformation into everyday operational practices. At the same time, the work makes it possible to show why these processes are difficult to replicate even within the same organization, arguing that in these healthcare contexts in which institutional work is successful, particular practices prevail in connecting discursive frameworks, limited implementation strategies and economic demands.

Keywords: digital health; institutional work; change

1 Introduction

The reflection on telemedicine conducted over the last decades underlines how the introduction of technologies in healthcare constitutes a moment in which the actors involved seek to condition the process and are called upon to redefine their own role. From this point of view, the ongoing changes constitute a privileged moment to observe in a real context the processes of negotiation, cooperation and conflict that start at the moment when the actors involved are getting ready to accept the technologies even before their implementation in working contexts.

At this moment, in fact, it is possible to grasp the making of representations of the future, the definition of new models of service organisation, the implementation of new work processes and new forms of division of labour.

Technological innovations linked to the prospect of social and organisational changes result in scenarios shaped by new forms of technologically mediated relationships between health workers and patients. Many projects aimed at the adoption of new technologies, however, remain without follow-up or find only partial realisation.

A case in point is remote monitoring in the field of cardiology, which is recursively presented as one of the building blocks of the already possible change in traditional medical practices. Remote monitoring is regarded as a characterising element of the overcoming of the chronicity management model based on periodic visits. Its replacement by clinical encounters on an as-needed basis is now made possible by a continuous sending of data by devices installed in patients' bodies and accompanied by other devices in the home. It is a continuous process of automatic sending and screening of data that makes the patients' trust greater and the need for a clinic presence less onerous.

Empirical analyses, however, show that telemonitoring, possibly supported by remote visits, has a limited diffusion and is often the subject of experiments that do not go beyond the pilot testing phase on small numbers.

This paper seeks to offer a critical perspective on the lack of widespread adoption of telemonitoring in cardiology, starting with the analysis of a successful case. By offering a reconstruction of the processes that led from the first experimental adoption to the definitive codification of the service as a clinical service, the paper intends to show the complex ecology of actors, knowledge, practices that are necessary to incardinate new services into the institutional fabric.

2 The contribution of institutional work

In complex organisational scenarios, the dynamics that determine a process of change and adoption of new technologies are multiple and cannot be traced back to a linear trajectory. It is often suggested in the ICT field to study the processes of technology diffusion in order to understand the adoption curves and the typical organisational configurations that enable them. A substantial amount of work has highlighted and explored these aspects, but from an organisational point of view, as Lawrence and Suddaby (2006) suggest, the 'diffusion' of a technology is often accompanied by a 'black box' idea that does not help to understand the intrinsic organisational dimensions of these phenomena. Another particularly consistent problem with complex organisations stems from the 'nesting' effect that each organisational dynamic brings with it. Each institutional actor, brings with it a multiplicity of planes of responsibility at the level, micro and meso primarily, that can make the dynamics of technology diffusion contradictory, especially when the hierarchies of these dynamics are unclear (Blavoukos et al. 2017).

The institutionalist perspective, and specifically institutional work, from this perspective offers a set of conceptual tools that lend themselves particularly well to critical investigations of these processes. Institutional work is defined here as the creative and rationally oriented activity of 'culturally competent' actors aimed at adapting to dynamic conditions through which institutions are created, reproduced and destroyed (Currie et al. 2012). This approach shows how different actors, using the resources at their disposal, act to change the institutions of which they are part and relates institutional change and everyday working practices.

In taking the perspective of institutional work, one can draw on a range of epistemological options that may even partially differ from one another. All these attempts

attempt to address the issue of correspondence between actions and the institutions that contain them. However, as Modell (2022) argues, the large body of studies on institutional work does not adequately and critically explore what happens within this construct when confronted with the reality of research fields. In the approaches most consistent with the tradition of institutionalism, the search for a certain isomorphism of dynamics to justify the managerial choices made always prevails, without however giving due weight to the situated and local dimensions. The seminal work of Lawrence and Suddaby (2006) had already emphasised this aspect by opening up a plurality of approaches with which to study institutional work including, for example, actor network theory. The nodes of these study approaches remain quite present over time with recurring trends that close the reflection within the scope of the scholars of this concept.

Aspects gaining relevance in the debate include on the one hand the question of the agency of institutional work (Troshani et al. 2018) and the possible intentionality of actors (Nyland et al. 2017), and on the other hand the dynamics of power and attempts to manipulate it. These are all processes that are part of a phenomenological dynamic and need to consider the choices of individuals in relation to institutional agency (Elder-Vass 2010).

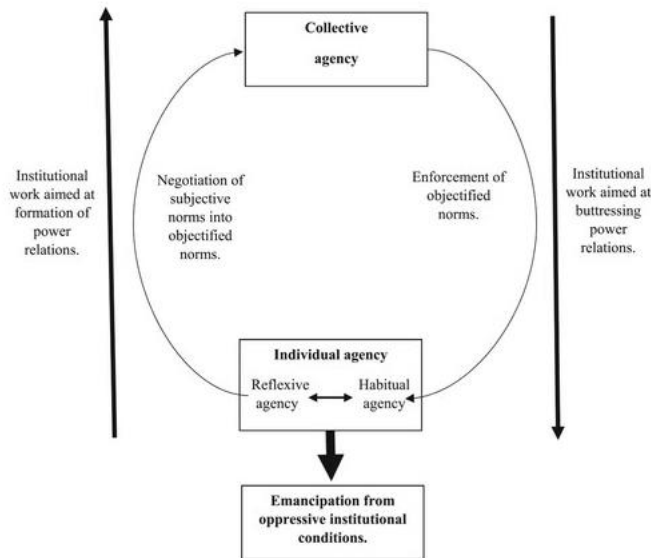
Without entering here into the complex debate that has extensively explored institutional logics in recent years, the reflections around the behaviour of individuals have appeared more complex and articulated. Amongst the various modelling proposed, however, it is difficult to understand the variations at the level of the individual precisely because of the membership of different social groups that may nourish different forms of reflexivity on different organisational situations (Elder-Vass 2010, 2015). Thus, according to these studies, on the one hand there is room for the contradiction fuelled by institutional logics and their agency that reverberates in the subjects, on the other hand, attention must be focused on the limits of actors' understanding of institutional logics. This opens up the possibility of reinforcing the logics through everyday practices, or of activating new practices and breaking with habitual forms of agency, and thus they can mobilise other actors who share the same perceptions through reflexive processes. According to the outline of the review conducted by Modell (2022), this dynamic can take hold and can generate new alliances by affirming 'reformist elite actors' who take on new guiding assumptions for their actions that challenge traditional pre-existing institutional conditions.

This recognition allows us to dialectically consider the top-down and bottom-up dynamics that characterize these processes.

In this paper, we intend to investigate a bottom-up dynamic of institutional work in order to understand under what conditions this reflexive path that overcomes and rearticulates institutional isomorphism can take place.

The work aims to answer two research questions. The first is to understand what the representations of telemedicine are for the different actors involved, with the aim of identifying possible elements of tension in the expectations associated with its massive introduction into clinical practice. The second question is what strategies the different actors deploy in order to seize the opportunities telemedicine offers them or to shield themselves from changes that are deemed to worsen their condition.

Figure 1. Institutional work, power relations and the possibilities of emancipation.



3 Fieldwork

During the exploratory fieldwork phase, we considered a complex and multifaceted dynamic involving cardiology departments in the regional system to be promising. These departments have introduced new technologies to monitor patients with heart failure and were conducting further digitalization processes for new patients.

Cardiological monitoring is one of the issues of greatest concern in the healthcare systems. Problems arising from poor adherence to treatment and the non-linear trend in patients' attention to cardiological health (exercise, diet, therapy), is a source of hospitalisation and worsening quality of life (Kotseva et al. 2019). Therefore, the vulnerability of such patients requires specific measures to ensure the adherence to follow-up therapies while preventing accessing the hospital.

Telephone calls and onsite visits are a time-consuming process and require specific skills as it generates a large amount of data that must be managed by trained staff limiting making it impossible to scale up the service (Ameri and Angermann 2020).

Remote monitoring services were developed rapidly and widely implemented for these patients (DeFilippis et al. 2020) and are regarded as effective especially for patients with implantable devices. However, the interpretation of the organisational transformations seems much more complex and organisational resilience in these situations is one of the most difficult challenges to make the changes stable over time.

Cardiology was one of the fields of application of the technologies developed and the department of one hospital in the region was keen to redesign of service provision through some innovative systems supporting telemedicine.

The purpose of the empirical research was to capture the actors' choices about the implementation, the evolution, and the institutionalization of a telecardiological remote monitoring practice. We adopted a qualitative research design to flank the phases of the evolution of the project from its design to its piloting, from its refinement to the redesign and scale up. To this aim, we conducted a longitudinal analysis involving the stakeholders in charge of the design of the remote monitoring system. To this analysis and for the purpose of this paper we will discuss the fieldwork related a department of cardiology who first promoted this innovation in the region and at the Italian Association of Arrhythmology and Cardiac Stimulation (AIAC). A total of 21 informants have been interviewed (some of them twice) for a total of 30 semi-structured interviews, that were collected, recorded and verbatim transcribed. The research has been conducted in two distinct phases. In the summer of 2020, we focused on implementation in the cardiology department. In early 2021 and during the autumn we conducted other interviews with other stakeholders and with the founders of the telemonitoring service of the cardiology department and some actors who no longer work in the department. This second phase of the fieldwork gave us a more complete understanding actors' reflexivity and about how they developed a new strategy to check over time of the implantable monitoring.

In total the stakeholders involved were:

- The political management
 - General Director of Regional Health Department -
 - Director of innovation for health services at the Regional Health Department
 - Director of Communication and IT services of Health Authority
 - Director of territorial services (GPs) of Health Authority –
 - Director clinical governance
 - The technical management
 - Director of a Research Centre for health technology innovation
 - Project manager of the provider of technological infrastructure
 - 2 Project managers of the multidisciplinary lab of technological innovation in health infrastructure
- The department management
 - Director of Cardiology Department
 - 2 Doctors at Cardiology Department
- The monitoring personnel
 - 4 Nurse of telemonitoring service

For the sake of the present paper, our analysis relies on the interviews with the clinical governance, the department management and the monitoring personnel. The other interviews provided the background context in which the innovation took place.

For an analysis of the overall innovation strategy in the regional system refer to Authors (2022). In this work, we shall focus on the innovation as it proceeds bottom up stemming from the activities of the cardiological department.

4 Findings

The fieldwork allowed to deepen and clarify the role of the different stakeholders with respect to the context of the observed digital innovation. We identified that the technology used comes from a variety of actors. On the one hand, there are the implant vendors who provide their own dashboards (product dashboard), then there is the health authority which has produced a general dashboard for all implantable. This network of institutional infrastructures has opened up the possibility for a series of actors to get into the flow of everyday practices that were able to change the flow itself (Authors 2022).

In the beginning, around 2015, the team was beleaguered by the problem of check-ups for patients who had implantable heart rate control devices that imposed waiting times of around 6-8 months. At that time, implantable devices capable of recording and analysing cardiological data came onto the market that would allow remote consultation. The remote monitoring functionality, made technically possible by the devices, was, however, not practised by the department except in what the director of the department described as a 'hobby form'.

A few selected patients were given the transponder that allowed the data to be sent to the cloud and from there to the doctors' dashboard. On these selected few patients, doctors could observe the data remotely, while all other patients with implantable devices had to travel in person to the department where their data was downloaded by the technical staff who analysed it during the visit. The term 'hobby form' refers to the fact that the remote monitoring procedure was practised without any training, without formalisation and in an unplanned manner within the ward routines.

"We already had the technology in house because of a choice I had already made when I was working in Trento, for the tenders for the acquisition of diagnostic and therapeutic devices (ICDs, pace makers, loop recorders, etc.), we chose in such a way that all this equipment was supplied already included in the price of the remote-control equipment. [Director].

The hobby phase allowed healthcare professionals to understand how it could change their daily work and the care relationship.

"We started out with nothing, there was no mandate but a futuristic vision, that is, with a view to the development of the technology's potential, because bringing 2,000 patients a year to the outpatient clinic is demanding, even to be able to manage it, you still have to spend time, you lose a lot more time, and you don't check on the patient every twenty days, every month according to the setting you could check him when you made the visit, and also from the safety point of view telemedicine gave you an extra tool to go along with the outpatient visit, so we started and then slowly the legislation helped and covid even more, when covid started telemedicine got a huge boost, a lot. .." [Head nurse at the start of the trial].

These new modes could not do it alone, so work was needed to find the right person. A person who knew how to 'make these technologies talk' by feeding data into a new workflow. The search for this person was immediately complex because of the frontier skills he or she had to possess. What was needed was a nurse who could handle the computer equipment and could read it with reference to the specific cardiological skills involved in telemonitoring work. This search focused on a nurse who had been out of the ward for a few months due to physical health problems that had compromised his path on the ward because of the radiation risk to which operators in the operating theatre are subjected. The director recalls with particular satisfaction the work of researching and convincing this person, which lasted about a year.

"So, [with the appointment in this department] I came here and said let's get this technology [made available by procurement] going. The second step is how to implement it and we had to find the right people, the next step was to get an extra resource dedicated to this work and the tricky step was to find the right person. [Director]"

But even this step alone was not sufficient to establish a recognised chain of institutional work within the organisational reality of the health authority. A third element was needed to make the work in the cardiology department truly institutional, the inclusion of telemonitoring in the regional and national nomenclature of planned activity. The director of the department explicitly speaks of a "third ingredient" after the technology and the people capable of "aligning" it with the other resources in the context.

"The following year [the human resource with the expected qualifications] arrived, and so we started with this project in 2015. So we had the ingredients: we had the technology; we had the person; we were still missing a step, a third ingredient, which was codification, that is, moving towards a formalisation of this activity. One of the big problems at a national level, but also at an international level, or at least at a European level for the lack of recognition of telemedicine activities, so one does these things but one does it on a voluntary basis, therefore with all that comes with it, something that is not quantified, someone who is not recognised, you have no cover, what you do you take on all the responsibilities... [Director]"

The fieldwork has shown that in parallel with the internal work of the core group of people who have become active around the telemonitoring laboratory, work has progressively been developed to inform and validate the entire telemedicine process among the scientific community of reference for this type of medical expertise. Doctors participate in national scientific societies of electrophysiology and create awareness around the subject. Discussions are held in those contexts on the training needed by healthcare professionals to be able to set up a telecardiology service and to support its validity in other regional contexts. This work focuses attention on a number of key issues that guide the production of papers published in international journals of reference for the international community.

In the meantime, the work can really be consolidated and the entire organisational machine has the basic elements to act in the context of cardiology tele-monitoring. It

soon became clear that this set-up would soon have to deal with the issue of the sustainability of the tele-monitoring laboratory given the increasing enrolment of patients with implants. In addition, doctors and nurses began to be operational in the actual work of the tele-monitoring practices. As the nurse acquires skills in handling the dashboards of the various brands and submitting the various situations to the referring physician, it is immediately apparent that the ongoing learning can lead to a major transformation in the distribution of competencies. It can be seen that the nurse can easily resolve an increasing proportion of monitored cases and require the intervention of the competent doctor only for particularly complex and difficult to manage cases. This progressive redefinition of competences is also solved by a particular management of the hospital information system so that the nurse is enabled to instruct "simple" cases directly on the central information system, making the centrality of his work evident even then.

"Yes. These choices here are mine and the director's, but also mine, in short, in the sense that I have pushed very hard with the CED, with the information services, to allow the nurse and other competent persons, once they have acquired that certain competence, to be able to sign that report, let's say, that report of the parameters... in which it does not state whether he is ill or not ill, [but] it states that those parameters are within the norm, that the impedance is right, that the frequency is correct, that there are no alterations..." [Head nurse at the beginning of the trial].

The experience gradually becomes a national case. Delegations of health workers visit from other regions to analyse the model, which becomes a point of reference in view of possible replication in different territories. The Dedicated Telemonitoring Nurse develops a further competence as a trainer offered throughout the Italian health system for the specific scientific community dealing with implantable devices.

Finally, the initiative generated a new assessment with the patient, who had to recognise and accept the new organisational methods by making the management of tele-monitoring data transparent, which was guaranteed in 2-3 days at most. The effect of this transformation generated among the patients immediately indicated an interest because an increase in the healthcare facility's focus on cardiological pathology and implanted instruments for monitoring was guaranteed.

"We had made a pact with the patient, where the patient at enrolment signed a document that in any case of pain... goes to the emergency room, because if I transfer the data, and in addition to this we had given a time now I don't remember if it was two days three working days, it was [important] to say [that] his data will be seen in x days, also because there were holidays, etc.. The nurse in charge was on his own and we couldn't think of doing h24 so there was a pact [between] nurse, doctor, department and patient on dates and times and how to handle any discomfort." [Lead nurse at the beginning of the trial].

5 Discussion

The fieldwork confirms how institutional work is the result of a complex set of activities that different actors on the organisational scene bring into play. The two main complexities can be indicated on the one hand in trying to align the everyday operational practices made possible by technology and on the other in convincing the institution to consider these new modalities as part of its own set of actions and services. We have also seen that the focal point where institutional work takes place is the situated context within which not only the agency of the actors involved in technological development acts, but also technology is a strategic ally with its own agency. The combination of these two tensions is not resolved in the simple adoption of new practices typical of a professional community, but must consolidate into genuine institutional work that is capable of transforming the organisation and transforming the rules that govern it, including the digital rules of dedicated information systems.

The story told by these field data confirms the hierarchical and incremental logic with which institutional work develops, which must be acted upon with recurring and repeated iterations in order to arrive at the complex objective of institutionalising new organisational practices. Work from this point of view can no longer be considered as individual or even as a simple network alliance but must assume individual reflexivity as capable of a collective agency that can modify the institution itself. As we have seen, these actions cannot be replicated simply by informing the scientific community and organisational decision-makers, but requires for each area of reference a negotiation is continued support over time for change to take place.

6 Conclusions

The processes described above read through the conceptual lens of 'institutional work' (Lawrence and Suddaby 2006), understood as the creative and rationally oriented activity of 'culturally competent' actors to adapt to dynamic conditions that constitutes the mechanism by which institutions are created, reproduced and destroyed (Currie et al. 2012). The paper aims to show how different actors, using the resources at their disposal, act to modify healthcare institutions by redefining their role in a scenario characterised by an increasing use of ICT tools in healthcare.

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