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Computerised Care for Diabetic Patients at CADA: An Analysis of the Relationship with a Social Innovation in a Hospital Environment

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Abstract: This article, which focuses on the computerisation of care for diabetic patients, analyses the relationship with a social innovation in the hospital environment at the Abidjan Anti-Diabetic Centre (CADA). The aim is to highlight the social logic of a denunciation of innovation in the patient-caregiver relationship through the Visiomed project. This article, which focuses on the computerisation of care for diabetic patients, analyses the relationship with social innovation in the hospital environment at the Abidjan Anti-Diabetic Centre (CADA). It sets out to highlight the social logic of a denunciation of innovation in the patient-caregiver relationship through the Visiomed project. The analysis focuses on the reconfiguration of patient-caregiver relationships, the social representations associated with the innovation, the trajectories of computerisation and management linked to the Visiomed project, and the issues and challenges of maintaining patients in the face of the innovation. The discussion of the results shows that the denunciation or rejection of the Visiomed innovation by the patient can be explained by the distancing of the Agent-Patient relationship, the differentiated representations that patients have of the attributes of technological innovation, associated with this computerisation of care monitoring through the Visiomed project. Moreover, these differentiated representations of the innovation are the product of the reconfiguration of the relationships between the health agents of the Antidiabetic Centre and their patients in the social field of communication.

Keywords: Innovation, Patients, Healthcare workers, Social relations, social representation, CADA.

INTRODUCTION

Diabetes is one of the most widespread chronic diseases in Côte d'Ivoire in recent years, according to data provided by the International Diabetes Federation (IDF) and the Ministry of Health. Treatment is complex and multidimensional. Several public and semi-public institutions are involved in the care of people with diabetes. (Ouattara & Droh, 2015).

With this in mind, the Abidjan Antidiabetic Centre (CADA) of the National Institute of Public Health (INSP) was set up in the 1970s to provide medical care for the first cases of diabetes (CADA, 2013). It was the first outpatient diabetes care centre in Côte d'Ivoire. It operates like a day hospital. Over the last three decades, care processes have become increasingly complex. This has naturally led to a division between medical specialities, with the result that the cost of treating diabetic patients has risen, doctor-patient relations have deteriorated, therapeutic management processes have not been mastered, and there is an absolute need to find a better way of making medical information available to healthcare professionals more fluidly.

It is against this backdrop of increasing complexity that IT has been introduced into the care of diabetic patients at CADA. Computing is a particularly dynamic sector, in which innovations in hardware and software follow one another in rapid succession. The range of technologies now grouped together under the heading of NICT "new information and communication technologies" (Bernard Ameka, 2006) has radically reoriented the way in which technological tools are used.

This has a direct impact on the care process, and has also changed the behaviour of users of these technologies.

Furthermore, managerial discourse promotes information sharing, presenting ICTs as both a factor of flexibility and an instrument supporting collaboration and knowledge sharing (Benghozi, 2001). This idea also permeates many discourses highlighting the potential offered by ICTs in the healthcare field (Bonneville, 2003; Carré and Lacroix, 2001), with these technologies pointing to new ways of working with populations (computerised patient record or IP, telehealth, etc.). However, as many have already shown (Bonneville, 2003; Carré and Lacroix, 2001), the growing use of ICTs in this sector (in Canada as well as in other industrialised countries) has its origins in a political will to structurally transform the healthcare system to make it more efficient and thus respond to a "productive imperative".

This article looks at the introduction of an IT tool in the care of diabetic patients at CADA through a project called Visiomed. This innovation can be seen as a process, a social change designed to meet a fundamental need. According to the promoters, Visiomed is part of the treatment of diabetics and is designed to reduce the arduousness of the tasks involved in monitoring and improving the care of more chronic patients. The computerisation of care for diabetics is part of a dynamic that CADA staff want to set in motion, and which will involve making it their own. In this context, information and communication technologies (ICTs) seem to be a vector that favours the coordination of healthcare professionals, the optimisation of healthcare expenditure through the proper organisation of care processes, and close cooperation to enable better patient care. Over the last ten years or so, all Western societies have been setting up information and computerisation systems for healthcare, particularly in hospitals, with the aim of integrating them into the healthcare process to improve patient care.

In Côte d'Ivoire, as in other African countries, there is no computerised information system to manage health in Africa. Efforts and resources are concentrated on relevant health problems, based on reliable indicators. In Côte d'Ivoire, the Abidjan anti-diabetic centre (CADA) has taken the innovative step of computerising its patient management system through its Visiomed project. The introduction of this innovation is reconfiguring the relationship between patient and medical staff. The anti-diabetic centre (CADA) is specialised in the care of diabetics, and the way it operates is faced with a shortage of nursing staff, given the number of patients (45,700 in 2016). This has an impact on all aspects of patient care (medical, cultural and time-related). In order to overcome these difficulties and constraints in the care and monitoring of diabetic patients, CADA decided to set up this project on 10 October 2016. It consists of 4 stages: digitisation of records, electronic management, electronic archiving and accompanying advice. These steps are intended to improve patient care in all its dimensions in an efficient manner.

This is in response to the shortage of nursing staff and the need to make up for the dematerialisation of physical patient files by digitising them. This process helps healthcare staff to develop new practices for monitoring patients. This is a more effective way of improving the supply and quality of patient care. However, despite the quality of the project 11 months after its implementation, there is still some dissatisfaction among stakeholders regarding the use of the IT system in the monitoring and management process.

From a sociological point of view, we observe the rejection or denunciation of an innovation that is supposed to improve the patient-caregiver relationship. On this basis, the question arises as to what are the social logics of the denunciation of innovation in the patient-caregiver relationship through the Visiomed project?

The study of medical policy within CADA falls within several sociological fields, in particular the configuration of the existential relationship between the treating physician and the patient. The authors BIOY Antoine, BOURGEOIS François, NEGRE Isabelle (2003, 2009), emphasise that caring has a dual aspect, the therapeutic aspect and the emphatic aspect: the carer cares better for the cared for if he establishes a relationship that is both professional and emphatic. The person being cared for is first and foremost a unique being, and to ensure quality care, the individuality of care must be taken into account. This means that each person is unique, with his or her own character, personality, fears, intellectual and social level. Health workers must combine human social relations with patient care. On the subject of social representations, Serge Moscovici (1961: 328-330) stresses that ideologies determine the nature and direction of relationships. He states that "representations are forms of naïve knowledge, intended to organise behaviour and guide communications".

Breton (2000:33) highlights the harmful impact of computers on human relations. According to him, "the computer is not just the Internet, and its "extensive use contributes to destroying the social fabric in terms of relationships too" ... "being together is replaced by the network, by "interactivity", more with machines, which contributes to creating very reactionary, rapid, uncommittal relationships".

With regard to the work of health sociologists, the sociologist Massebreuf (2000:23) notes that this discipline enables "the social analysis of health issues, i.e. how health problems are perceived, defined, studied and managed within one society and from one culture to another". This study attempts to analyse the social relationships of the CADA's stakeholders to the issue of the computerised patient management system.

Thus, in a break with a health approach aimed at showing the discontent of those involved in the computerisation of the health system, this article analyses the social logic underlying this phenomenon. To do this, the specific objectives are to describe the social relations induced by the innovation of the Visiomed project that led to its rejection by patients. Secondly, to describe the social representations associated with innovation in patient-caregiver relations through the Visiomed project.

1. MATERIALS AND METHODS
2.1 Study Site and Population
2.2. Data Production

The mixed approach, based on the information between the semi directive, the questionnaire and the direct observation, was adopted for the collection of information on a sample of 200, 185 actors were interviewed. The interviews have been addressed to two categories of actors constituting the target population to know the sick diabetics and health agents of the CADA of which three doctors have been interviewed; six nurses; an archivist; a help-soignant; one hundred and seventy-three sick diabetics; a diabetic association.

Data was collected from the various categories of stakeholders using purposive sampling. Participants in the study were selected on the basis of their knowledge of the field and exclusion factors such as age and status. All the interviews revolved around the following themes: identification of the respondent; difficulties encountered in the activity; ideologies associated with technological innovation (computer); method of acquiring the computer tool; social relations of production.

The interview guide was drawn up according to the objectives of the study. Interviews with respondents were recorded using a mobile phone and transcribed using Word software, and questionnaires were drawn up for patients and nursing staff and processed using IT tools such as Stata, Cs pro and Excel. The role of the questionnaire in this study, thanks to the indicators, was to provide clear and precise analyses of the research questions raised by this study. These analyses led to the following results.

2. RESULTS
2.1 The Visiomed Project: A Reconfiguration of Patient-Caregiver Relationships

The results of the analyses show the denunciation or rejection of the Visiomed innovation by the patient and can be explained by the fact that it reconfigures relationships. This reconfiguration creates links of conflict, dehumanisation, backbiting, etc. The data from the study show that innovation deconstructs the logic of local solidarity, modifies relationships and affects interdependent relationships. We can justify these definitions in the following terms/

According to respondent 1, (D.S) 55; retired policeman << our relationships have changed too much now, compared to before when there was more attention, listening because of the computer we are no longer close, it separates us, we have to live with it since it has been replaced by the human being. It's certain that the doctor doesn't write down everything the patient says, but only the problem and the treatment in a summary.

For him, reconfiguration has created a bond of conflict, dehumanisation and backbiting.

"*Ahh!! our relations are sometimes conflictual, because we are not the same, doctors exchange more or less depending on who is in front of them, there is sometimes cheating or inequalities between us patients when we are both ill, why hum*" Respondent 3 (F.S) woman 30, teacher

The implementation of innovation therefore implies a reorganisation of the social relations of production. The emergence of "new" social relationships within the CADA between the nursing staff and the patient, modified by the presence of the computer in the new way of providing care.

2.2 Social Distancing: Ideological Variability in the Validation of the Relative Advantage of the Technological Innovation of Computerised Care Offered at the CADA

This ideological variability in the validation of the relative advantages of Rogers Everett's innovation highlights two explanatory dimensions of social distancing: social dehumanisation and the social proximity of relationships.

A- The Social Dehumanisation of Relationships

The patient's denunciation of the Visiomed innovation can be explained by the fact that it dehumanises the relationship. This dehumanisation is a factor in explaining social distancing. The staff do not consider the patient as a whole and in his or her entirety, taking into account the different social frameworks. An ostensible innovation always provokes spontaneous resistance, to whatever degree, because it upsets habits and requires a learning process that can be negatively experienced by certain members of a group, as it does not bring them any rewards and seems to make their work even harder.

"*I don't agree, the doctors were even supposed to ask for our opinions, but nothing. If the computer is in the consultation room, I don't think it's right because doctors are going to concentrate more on the machine than people do, and I know what I'm talking about, that's what I did before I fell ill*" Extract from interview with (T.J), 45-year-old man, information

These comments are supported by the tables and graphs below.

Table 1: In your opinion, what impact does the information have on your relationship with healthcare staff?

Terms and conditions	Workforce	Percentages% (%)
Conflicts	23	13.3
Remoteness/dehumanisation	108	62.4
Rapprochement	41	23.7
No advice	1	0.6
Total	173	100

Analysis of the quantitative results of the interpreted data supports the idea that innovation has reconfigured patient-caregiver relationships. Indeed, 2 out of 12 staff (16.7%) stated that having computerised care had led to conflictual relations between them and patients, compared with the old way of working.

B- The Visiomed Project: an Abandonment of close Relationships

Patients' criticism of the Visiomed innovation can be explained by the fact that it has led to an abandonment of social proximity in exchanges. This is an explanatory factor in social distancing. The following verbatims attest to this:

"Bonn, my daughter used to be a bit happy with them, like all institutions, the CADA functioned normally when we came before, the patient's registration was done by hand without the computer. The nurse creates the file, fills in the identification section, creates the day's visit and transfers the file to the former patients' nursing station. But everything has changed", extract from an interview with a woman, aged 30, primary school teacher.

"Fumm, my daughter, there have been too many changes. Before the Visiomed project, the care staff at the CADA were very welcoming, things were normal" there was a table, a register, and at the table was a major who looked at everyone's appointments. Each time, there were frequent changes, and anyone who didn't know their number was disorientated. But in those days they were human and not machine robots, so it was a bit better. Then there was only one way of archiving files, and taking vital signs (weight, blood pressure, height, blood sugar) was done by hand, without a Bluetooth connection to the computer". Extract from an interview with (D.S), male, 55, retired policeman

According to patients, the old way of managing and monitoring care formed a circle of solidarity. So, for patients, computerising care should not just be about achieving positive spin-offs, but also taking into account the risks associated with the distancing it may cause. All innovations are designed to establish or reorganise the way in which an institution operates.

Table 2: How do you find the consultation time since the integration of the computer?

Terms and conditions	Workforce	Percentages% (%)
Slow	56	32.37
Fast	45	26.01
No opinion	2	1.16
Too short	32	18.50
Very slow	2	1.16
Very fast	35	20.23
Too slow	1	0.58
Total	173	100

The results of the quantitative study clearly confirm the change brought about by the integration of the computer into the operation or process of caring for CADA patients.

2.3 Social Representations Associated with Innovation in Patient-Caregiver Relations Through the Visiomed Project

Differentiated representations of the attributes of innovation constitute an element of resistance to the Visiomed project. Indeed, the denunciation or rejection of the Visiomed innovation by patients can be explained by the differentiated social representations of the attributes of the innovation as an element of resistance to the Visiomed project, associated with the computerisation of care in patient-agent relations at the CADA. This is seen in the comments made by the respondents below.

Interviewee 2: extract from interview with (D.F) pregnant woman, 31 years old housewife

"The advantage is that now the files will be anonymous, rather than on paper, the information about your life is better hidden and confidentiality is respected. But incontinent people have become like robots, we don't want that, and there's not enough communication between us".

It emerges from the results of the study that the differentiated representations of the attributes of social innovation refer to a process that involves delivery and beliefs that rub off on carer-patient relationships. These beliefs are transformed into dogma and practices are rigid or mechanical in relation to the initial objectives and procedures assigned to the project, especially by the health workers at the Abidjan diabetes centre.

Table 3: In your opinion, are there any advantages or disadvantages to using the computer during consultation sessions?

Terms and conditions	Workforce	Percentages% (%)
Both advantageous and disadvantageous	120	69
Don't know	19	11
No (disadvantages)	19	11
Yes (benefits)	15	9
Total	173	100

2.4 Trajectories of Innovation and Care Linked to the Visiomed Project Presentation of the Visiomed project

Founded in 2007 by Éric Sebban, VISIOMED GROUP is a company specialising in new-generation medical electronics. It is a laboratory that develops and markets innovative healthcare products in the growth areas of self-diagnosis for medical use and well-being. Based in Paris, VISIOMED GROUP relies on a team of 105 employees, including sales forces dedicated to marketing in pharmacies (OTC), to healthcare professionals (hospitals, clinics, retirement homes) and, since the end of 2010, in mass retail. VISIOMED GROUP qualifies as an "Innovative company".

It is a French company that integrates innovation, technology and design to provide non-medicinal preventive treatment solutions focused on simplicity, comfort and well-being for users, such as: (Thermo Flash, the 1st non-contact infrared medical thermometer, leader in new-generation medical electronics. Computerisation of the system and the possible trajectories of care for diabetic patients.

The denunciation or rejection of the Visiomed innovation by patients can be explained by the new social practices of computerised care associated with the Visiomed project. In terms of trajectory, this new social practice is characterised by (2) elements. Symbolism and contingency.

2.4.1 The Symbolism of an Innovation

This denunciation of the Visiomed innovation by patients is linked to the fact that the technical tool of information for care and management does not have the capacity to maintain humanism in the care relationship.

At a symbolic level, the intrusion of a new technological tool is badly perceived by patients who are already being colonised by computerised technical devices during consultations in the practice of care having to deal with connected objects in the practice of care such as computer screens, glucometers, thermometers, flash blood pressure monitors where the patient is no more than a "part, a client object" in the technological operation in the practice of care. Even if the computerised prescription is only intended to help the practitioner in his tasks, it is conceivable that in certain cases, it will end up subtly replacing the effort of decision-making. The fact is that the relationship in healthcare practice is no longer linear, but has become triangular. For example, the presence of a computer in a space where the players interact tends to prevent a direct form of discussion.

From being a simple decision-making aid, computerised prescribing software could, in such a context, end up undermining the interactive process of patient participation in the therapeutic strategy, as the following verbatim testifies:

"Before the computer, the treatment process was manual and the patient had to be registered at reception and the appointment ticket checked. Now the steps have changed too much with Visiomed, we need to digitise patient files, dematerialise the file, do secure archiving and provide support, only the patients aren't yet adapted to this because of the computer, we can't fill in the data and there's too much risk of medical error which can cost our patients their lives" Extract from an interview with Doctor (D.P), 38, endocrinologist.

In short, the results show that a contrast is emerging. On the one hand, patients who want human social interaction before computerisation, and on the other, carers who, in their desire to receive and care for as many patients as possible, are opting for computerisation of care via connected objects.

2.5 Contingency of an Innovation

The denunciation of the Visiomed innovation by patients is linked to the fact that the computerisation of care management through the Visiomed project becomes contingent with regard to the possible trajectories that this process may follow.

The initial results of this pilot phase were presented on 14 November 2016 on the occasion of World Diabetes Day. Today, in its practical phase of computerisation of medical care over the last two years, which runs from October 2016 to February 2017, has

been able to achieve a number of its objectives in relation to the Visiomed project.

CADA has a database of patients whose files have been registered in the Visiomed application, giving a total of 2,170 files and an overview of patients actually seen for consultation at the Abidjan diabetes centre, i.e. 2,070 files. We can see from the results that a greater number of chronic patients are being monitored since the innovation of this IT tool.

2.6 Computerisation of Healthcare Practice: Issues and Challenges of Maintaining Innovation

The care information process and the rationale for implementation at CADA. Analysis of the corpus of data reveals that patients' denunciation of the Visiomed innovation is linked to the fact that computerisation of the healthcare sector is based on different visions and conceptions associated with the implementation and deployment of computers in healthcare practice. These are characterised by the interests that each stakeholder derives from the way in which the CADA management system operates: medical, technological, economic and political issues.

The social reality as experienced by the players in the social field of the study is marked by players with divergent interests acting according to a utilitarian logic of costs and benefits.

Table 4

Terms and conditions	Workforce	Percentages% (%)
Request more attention	4	33.33
Calls for greater rigour	2	16.67
Mastering the computer	5	41.67
Computer skills	1	8.33
Total	12	100

The results show that this innovation is advantageous for nursing staff and disadvantageous for patients.

3. DISCUSSION

The denunciation or rejection of the Visiomed innovation by patients can be explained by the distancing of the relationship between nursing staff and patient, and by the differentiated representations that patients have of the attributes of technological innovation associated with this computerisation of care monitoring through the Visiomed project. These results will be discussed from two angles

3.1 Distancing Relationships: A Reconfiguration of CADA's Patient-Caregiver Relationships

Patients' denunciation of the Visiomed innovation can be explained by the fact that it reconfigures relationships. This reconfiguration creates links of conflict, dehumanisation, backbiting and so on. The social reality as experienced by the social actors is marked by a strong regularisation of technical activity which results in relationships of distance, disrespect and proximity between the CADA actors and the patients. The innovation deconstructed the internal logic of solidarity, friendship, kinship and sociability between the two players within the institution. The implementation of the institution implies a reorganisation of social relationships in the practice of medical care. This initiative calls into question acquired positions, prerogatives and interests in the face of the Visiomed project's objectives. Dehumanisation also structures the interpersonal relationships between healthcare workers and patients in fields of communication. Trust in this field means that institutional players are not a model reference for patients.

3.2. Differentiated Social Representations of Computerisation at the CADA: As a Social Innovation

Harrisson (2012: 196) points out that "Social innovation leads to social transformation through intentional actions. Two major sociological concepts make it possible to address this issue: a conception of social change and a conception of the motivation of social action. The aim of sociological theories is to discover the ways in which society functions. These do not manifest themselves in the unified positions of social actors, but through tensions, conflicts and oppositions that attempt to come to terms through the social construction of new structures and new rules of operation that give shape to social cohesion and order".

In the context of our study, the visiomed project is a social innovation in the sense of a changé in the medical management of diabetes. Innovation is the ability to solve problems creatively, or to bring new possibilities or capabilities to fruition in social reality. CADA wanted to break away from traditional diabetes care by computerising its services. This makes it possible to store all patient information digitally and, above all, to save time in filling in patient records. However, any innovation can generate tension and conflict. Patients have a more or less negative perception of the technological "novelty" of computerised care.

Diabetes is a chronic disease, requiring prolonged treatment and, above all, a very close doctor-patient relationship. This is no longer the case with the computerisation of healthcare. However, the health workers have built up their beliefs in the tool, as experienced players with knowledge of how to create

computerised medical records and who have mastered the use of the tool as a result of their training.

CONCLUSION

The aim of the study on the computerisation of the management of diabetic patients at the Abidjan diabetes centre (CADA) was to understand the reasons for the denunciation of innovation in patient-caregiver relations through the Visiomed project.

Indeed, the arrival of this IT tool reconfigures the relationships between these social players at CADA, fostering a less harmonious, more dehumanising and less constructive relationship. This influence, however minimal, is of considerable interest, especially if the monitoring and management of diabetic patients can be improved as a result.

Analysis of our study and the data reveals that computerisation of care does not radically change the doctor- patient relationship, but rather 'transforms' it. Indeed, for carers, the presence of computer use is not a disadvantage. According to our results, this new tool does not seem to threaten the relationship of trust established between doctor and patient, but on the contrary helps to bring them closer together in the care relationship.

However, this evolution in the doctor-patient relationship is not simply linked to technical innovation, but is the result of innovation in the current context, with explanatory factors (structural, economic, political, cultural) and many others that are not negligible. Doctors therefore need to take greater ownership of this tool in order to better support their patients in their treatment.

But we must not lose sight of the fact that new technologies do not attract health centres simply because of their innovative aspect; they must be a genuine factor in the production of added value. Developing a typology and behavioural model of users would seem to be a good way of enabling them to be adopted, and for innovation to move in this direction by enabling systems to be better adapted to the specific characteristics of each type of user.

In addition, the issues surrounding healthcare and this study are that the computerisation of healthcare provides solutions. It makes it possible to partially compensate for the shortage of technical and human resources, by encouraging data exchanges that enable medical investment and expertise to be concentrated on a few sites.

BIBIOGRAPHY

- Akrich, M. (1990). De la sociologie des techniques à une sociologie des usages: L'impossible intégration du magnétoscope dans les réseaux câblés de première génération. Techniques et culture, *Éditions de la Maison des sciences de l'homme*, pp.83-110.
- Alter, N. (2010). L'innovation ordinaire, Paris, PUF 2010.
- Bachelet, C. (2004). « Usages des TIC dans les organisations, une notion à revisiter ? », Acte de colloque de l'AIM, Evry, *la revue des infirmiers*, numero162(2010).
- Bardini, T., & Horvath, A. T. (1995). The social construction of the personal computer user. *Journal of communication*, *45*(3), 40-65.
- Blanchet, A., Gotman, A. (1992). l'enquête et ses méthodes, Paris, *Nathan*, 19p.
- Boiy, A., Bourgeois, F., Negre, I. (2009*). Communication soignant-soigné, édition Bréal*, 158p.
- Breton, P. (2000). *Le culte de l'internet. Une menace pour le lien social?* Paris, La découverte.
- Compiègne, I. (2011). *La Société numérique: La société numérique en question (s)*. Sciences humaines.
- Fainzang, S. (2006). *La relation médecin / malade : information, mensonge ou vérité*, PUF, 156p.
- Gaglio, G. (2012), Sociologie de l'innovation, paris, PUF, coll. *Que sais-je* ?
- Harrisson, Denis. (2012). Quatre propositions pour une analyse sociologique de l'innovation sociale, *Cahiers de recherches sociologiques*, n° 53, 195-214.