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SERVICES CO-CONSTRUCTION IN THE FRENCH HEALTHCARE SYSTEM WITHIN PATIENTS' DIGITAL USES - AN APPROACH THROUGH SOME INFORMATION PLATFORMS

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DICEN IDF (Information and Communication Devices in the Digital Era)

The greater part played by patients in the French healthcare system will be pointed out in a perspective of value creation. Actually, since the first healthcare networks (“réseaux de santé”), we can observe another step in coordination with patients' care pathways. Information and Communication Technologies (ICT) enhance the e-patients' involvement: patients are more and more active in checking information, getting interactions on digital platforms, sharing their feelings with other patients, evaluating the quality of care, etc. Thus we will analyse the process of co-construction through some new services provided in answer to the e-patients' needs and their effects on the healthcare system. In order to identify the services provided, we will propose an approach through different examples of information platforms. They now tend to be more global, centralising a large range of services and above all improving information through interactions between patients. We will present a typology of these new interactive socio-technical devices.

Le rôle plus important tenu par les patients dans le système de santé français sera mis en exergue dans une perspective de création de valeur. En effet, depuis les premiers réseaux de santé, on peut observer une autre étape dans la coordination avec les parcours de santé des patients. Les Technologies de l'Information et de la Communication (TIC) permettent d'accentuer l'implication des e-patients : les patients sont de plus en plus actifs dans la recherche d'informations, réalisant des interactions sur les plateformes web, partageant leurs ressentis avec d'autres patients, évaluant la qualité des soins... Ainsi, nous analyserons le processus de co-construction à travers de nouveaux services offerts en réponse aux besoins de e-patients et leurs effets sur le système de santé. Afin d'identifier les services offerts, nous proposerons une approche à travers différents exemples de plateformes d'information. Celles-ci tendent à devenir plus globales, centralisant un ensemble plus large de services et en améliorant les informations au travers des interactions entre patients. Nous présenterons une typologie de ces nouveaux dispositifs socio-techniques interactifs.

1. Introduction

This work in progress corresponds to the cooperation of two academic researchers and a consultant also associated researcher in a University research team.

In the French healthcare system, the healthcare networks (in French, “*réseaux de santé*”) exist for thirty years, since the first experiments in the 1980. Their aim is the coordination set up between all medical, care and social professionals who take care of a patient. Besides cooperation, the main characteristics in those healthcare networks organizations are a dedicate team and a care plan for each patient. A new significant evolution is observed with the more recent approach of patients’ care pathways and a real stronger patients’ involvement for their health, the so called “patients’ empowerment” and so the development of the idea of “patient’s pathway”.

In the French 2016 Healthcare Law¹, the patients’ care pathway (“*parcours de santé*”) is described as based on a team in primary care with the aim of a better coordination between professionals and prevention, and for improving the welfare level in territories. This evolution is in close relationship with the epidemiologic transition in long-term care management and patients having often to deal with several pathologies. With Information and Communication Technologies (ICT), patients have now a proactive role in searching information for healthcare and sharing experiments, assessments, feelings, doubts and questions.

Thus we intend to define the concept of e-patient as examining the effect of this change on the French healthcare system: e-patients require evolutions in provided IT tools and services through digital platforms, and technical device as computer, tablet and smart phone enhance the patients’ empowerment.

Considered as an intermediary between services providers and users, the platform model offers free services where the centre is the data created by the users’ activity, or “free work” according to Collin and Colin (2013), which is source of value. Those personal data can be collected, used and made available for third party operators through programming interfaces that will then create new services and thus develop an ecosystem of applications around the platform. Centralising and standardising the data, the platform participates to a complex process of services co construction. The point of view chosen for the proposed communication is the service provided between patients, with data generated by the users’ activities on platforms through sharing experiments and feelings about their healthcare. The platform operator or the third parties with the ability to create new services from the users’ data are not directly addressed. This committed position can be explained by the strong development of the patients’ activities on those platforms, and by the central role-played by

¹ Law about the healthcare system modernisation - January 26th 2016

data in the device value creation. However, we do not underestimate the decisive role of “hypermediation”² performed by the organisation that manages the platform and that we will consider in the analysis. For understanding in what does the creation in the healthcare platforms consist from the patients’ point of view, we will first discuss about the key concept of platform; then we will analyse some different healthcare information platforms.

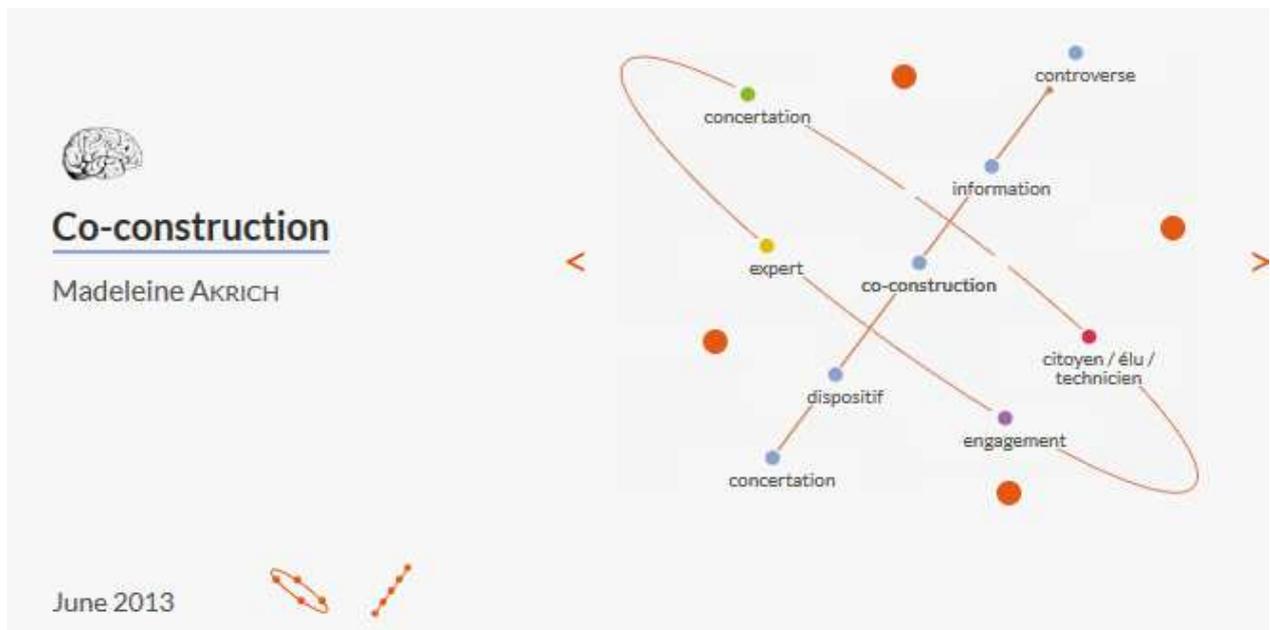


Fig. 1: Co construction – Source <http://www.participation-et-democratie.fr/es/dico/co-construction>

2. The key concept of digital platform in the healthcare field

Starting from the data exchanged between the patients on the platforms, the typology proposed by Romeyer (2008) helps to make the difference between two types of healthcare platforms: those dealing with medical information and those interested in more general healthcare information.

The first type of platform proposes information from source guaranteed by professionals.

The second type corresponds with general audience platforms. Information are various and coming from users. They are the expression of citizens’ empowerment (healthcare democracy in France in the law about the patients’ rights - March 4th

² Blog de Nicholas Carr (2005): hypermediation 2.0 (<http://www.routhtype.com/?p=168>) , (2009): google in the middle (<http://www.routhtype.com/?p=1249>)

2002 or “*démocratie sanitaire*”) and can convey the ideal of “perfect healthcare” or “*santé parfaite*” (Sfez, 2011).

Such a differentiation is found again between the territorial support platforms: “plateformes territoriales d’appui” (PTA), and the information platforms, the first ones providing care services and the others healthcare information services. Both types of services are part of e-health.

The healthcare sector has for long been quite cautious about digital technology, either with the resistance of the traditional healthcare players anxious about protecting the existing balances (the Kodak syndrome reminded by Ologeanu-Taddei et al. (2016) or as a precaution, as Marisol Touraine (2016) says³ in her recent oral presentation of the e-health strategy. For the minister, the e-health, which expresses the digital transformation in the healthcare field, includes “women and men mobilised for improving our ways of preventing, diagnosing, curing, or simply communicating”. This global approach does not seem to be either techno or medico focused, but remains vague. The ministry recognises the importance of expanding new practices.

Concerning the platform Bepatient, she highlights how “this start up points out to which extent the junction of digital and healthcare is a promise for the patients, the professionals and the healthcare system as a whole.” She goes on as follows:

Today, we are witnessing acceleration in healthcare digital innovations. It is nowadays possible to perform surgery remotely, to “print” prostheses, and soon organs, with 3D printers; medical devices are more and more often connected, as pacemakers, glucometers and soon prostheses. Connected t-shirts enable to anticipate epilepsy crisis... Today, the citizens learn how to manage and evaluate their healthcare through information produced by connected devices.

In concrete terms, she notes the arrival of new services without making clear how they appear? How they are produced? Who will produce them? We understand that by the side of traditional medical players, the technologies providers and the patients have a place to win. But which part will take each of the operators in its connected device?

The digital platforms represent an interesting observation ground for the e-health setting up. Will the connecting platforms really give to the patients/users the ability to become independent and active for their healthcare, even skilled for participating to diagnoses, for instance? In that situation, what would they have in common with the patients searching for official medical information? Can we talk about services co production? Can we consider co innovation? Which confidence in digital data exchanged between patients? Is it so far away from proximity remote medicine? Will this trend carry consequences on the medical professions?

It is absolutely certain that the digital platforms are socio technical devices that call the user’ positioning into question, as well as the degree and the nature of his involvement (emotional, factual, pragmatic, medical).

³ Ministry of social affairs and healthcare – Speech on July 4th 2016 - Source http://social-sante.gouv.fr/IMG/pdf/16_07_04_intervention_mt_-_presentation_strategie_e-sante.pdf

The digital platforms are today a world outside the medical sphere, which is protected by its partitions and the problems of interoperability for the information systems, with a closed regulatory framework on information. However, some traditional players are present on digital platforms providing lucrative services in parallel of the traditional system (Epiderm, Directdoc, deuxiemeavis, etc.).

The observation of what is in action within those platforms where healthcare data are exchanged is an important issue for the healthcare system, because if they keep their promise in providing welfare for the patients and lucrative business models for applications publishing companies, the platforms should deeply call into question the traditional healthcare system.

3. Methodology for analysing the on-going digital evolution

We will analyse the evolution in the implication of the patients in relation to their use of ICT.

More and more patients look for information on Internet about their symptoms, their pains, their disease, the causes and the treatments before going to medical consultations. Many platforms like doctissimo.fr provide healthcare information to e-patients. Some public service home pages are now developed for healthcare information: for instance, the access to the database “medicaments.gouv.fr” provides information about medicine composition. Appointments for medical consultations in hospitals or with many doctors are now taken through Internet, where patients can find many advice, guidelines and chats about prevention or care.

With the integration of ICT and Internet 2.0, e-patients interact with other patients on social networks with community websites like “cancercontribution.fr” for sharing experiments about their pathologies; they also look for healthcare coaching and use on line transactions like, orders and payments on line for medicine....

Some mobile phone apps help patients during of after their stays in hospitals with appointment reminders, advice and personalised information about treatments: a recent example is MyCurie for French oncological centre Institut Curie. The e-patients really want to be actors and no longer passive in healthcare: therefore, they check the quality of cares in hospitals and also evaluate them from their own experiment, on a platform like Comparhospit (empowerment challenges). Their opinion and way of thinking can even be required as patient experts for innovation (idea of co-innovation).

The French Diabetic Association: “*Association Française des diabétiques*” (AFD), for instance, has launched the “Diabète LAB” for testing new disposals with the patients’ involvement. The aim is to integrate the diabetic patients in the design, the development and the evaluation of innovations. The patients are required for trying out devices and giving their opinion.

Through some examples of healthcare digital platforms, we will present their purposes, the categories of users they address, the services they offer, and the value creation they bring to the healthcare system in helping to broadcast information, to

share experiments and organise care. This process will be led through an overview of the platform Bepatient as providing a complete bunch of services in answer to the main e-patients' needs.

For purposes of pointing out the links between the co existing and the co acting, F. Bernard proposes "to make function, while associating and articulating them theoretically and practically, the issues of the link, the sense and the action" within the scope of the paradigm of the committing communication for understanding. It seems to us to constitute an input to the issue of the "existing together" in the organisations. "The sense and the link that appear from action into interaction" applied in this communication have led to prefer a research-action approach.

The healthcare platforms correspond to two main types of uses: providing information, especially for the patients (those platforms being mainly websites) or forming frames for new services for the patients and above all for the healthcare professionals. Our communication is placed in the first viewpoint that matches with the rise of the part of the "layperson" which is enhanced by the Internet technologies as analysed in particular by P. Flichy (dialogue between the expert and the layperson).

Theoretically, the non-professionals take action in a non-commercial sphere where they give their opinion and discuss. The exchanged information becomes potentially usable resources, and in some situations the commercial sphere is interested in them. Flichy (2010) holds up as an example the healthcare sector and the exchange websites where the patients search more to exchange information, to be reassured, even to cooperate rather than to replace the doctors.

The platforms can link together different logics, the community logic and the commercial logic (Trompette et al., 2009). Flichy (2014) makes the difference between the "connected individualism" combined with the use of ICT that can be found in the commercial sphere and the community position in which individuals, based on a common interest (here in relation to the disease), put information in the service of the group. Between them, a large field of possible layout appears for studying in the area of the healthcare information platforms.

The main characteristics of patient's healthcare pathways is a succession of hospital stays alternating with home stays thanks to the assistance of nurses coming at home, resuming social life and work as following treatments, etc.

The general practitioner remains the "gatekeeper" for medical aspects but another coordination has to be organised for enabling patients to stay at home for day life.

Compared to Healthcare Networks, dealing with long term pathologies require to make the link between the different episodes in care: at the entrance of the hospital stay, on the way out, entering another place for "convalescence", coordination with medical and nursing teams at home, specialists in town, etc.

This transition to a longitudinal model demands cooperation with even more numerous and various professionals, each action having to contribute to a global improvement for a general better way of living in the long run. The cancer patient's pathway is a significant example, as patients now have to live with a cancer, which is no longer an acute pathology.

There could be some remission periods, or new episodes requiring intensive cure, and then mainly care for a newly active life, which requires to refer to many kinds of

information: social rights, body wellness, helping devices, recovery advice, sharing other people' experiments.

With the decrease of acute pathologies, patients get more and more involved in seeking information by their own, as they now have to handle their disease(s) for years. It is observed that more patients get information on Internet before going to a medical consultation either with a general practitioner or with a specialist in town or in hospital. Their opinion is sometimes required for taking orientations in their health-care pathway.

Even elderly patients frequently seek information on Internet and have a permanent use of mobile phones for day life so that ICT are fully integrated by a majority of patients. With extended uses of ICT, e-patients expect in healthcare the same level of digital services as in other fields. Besides seeking information about healthcare or diseases on Internet, more patients want to be able to get appointments on Internet.

For main services, people are now asked about their satisfaction through Internet survey after shopping or using information services: they can express themselves about matters of discontent or ways of improving the quality of the services.

4. Answers to patients' needs for healthcare with ICT

ICT make possible not only to find information about healthcare and disease, but also help to get it through easy ways, with advice for prevention on chats or videos, games that can be browsed. Patients can be better informed and, thanks to new digital possibilities, can be more involved for their healthcare.

For appointments whether at a medical laboratory, with their general practitioner, a medical specialist, or at the hospital, many websites now enable patients to ask them directly, to be confirmed, to make changes, etc.

As for evaluating the services that are provided, they are now asked by e-mail to give their opinion about the quality of their stay in hospital and not only by filling a paper form.

How is it possible to check if medical information on Internet is trustable or not? A label called Health On Net (HON) was created to attest certified medical information on Internet, but the French High Healthcare Authority: "*Haute Autorité de Santé*" (HAS) no longer follows it.

4.1. Doctissimo



Fig. 2: A private healthcare platform

Two doctors created Doctissimo in the year 2000 and it is the French better-known medical information website. It belongs to the Lagardère Group since 2008.

It did not get the HON certification. Its structure offers several items, “healthcare” or “medicine” can be chosen among them, and other items are wider like “nutrition”. Many articles are accessible and can be selected. Two links enable to connect directly for a medical appointment on Mondocteur or for ordering medicine on Docti’Pharma.

For each heading, it is possible to activate a drop-down menu, so that for “healthcare”, we can access to detailed items as “diabetes” or “throat pain”... On the forum also, items can be selected before launching some discussion. Information can be searched with two main choices: article or medicine.

Besides the forum, tests are available: after a general access to the healthcare quiz, different choices appear for very different and specific quiz as “epilepsy”, “tiredness”... A chat on Club Doctissimo requires first creating an account. Some issues can be drawn from this overview: on this well-known platform, the healthcare information is definitely popularisation, provided among other matters.

On a rating survey about websites frequentation realized by “OJD” on March 2014, Doctissimo takes the 6th rank among “, with 8 070 181 people, including 6 439 320 French people, 38 416 549 viewed pages and 4,79 web pages per visit.

How popular is doctissimo.fr?

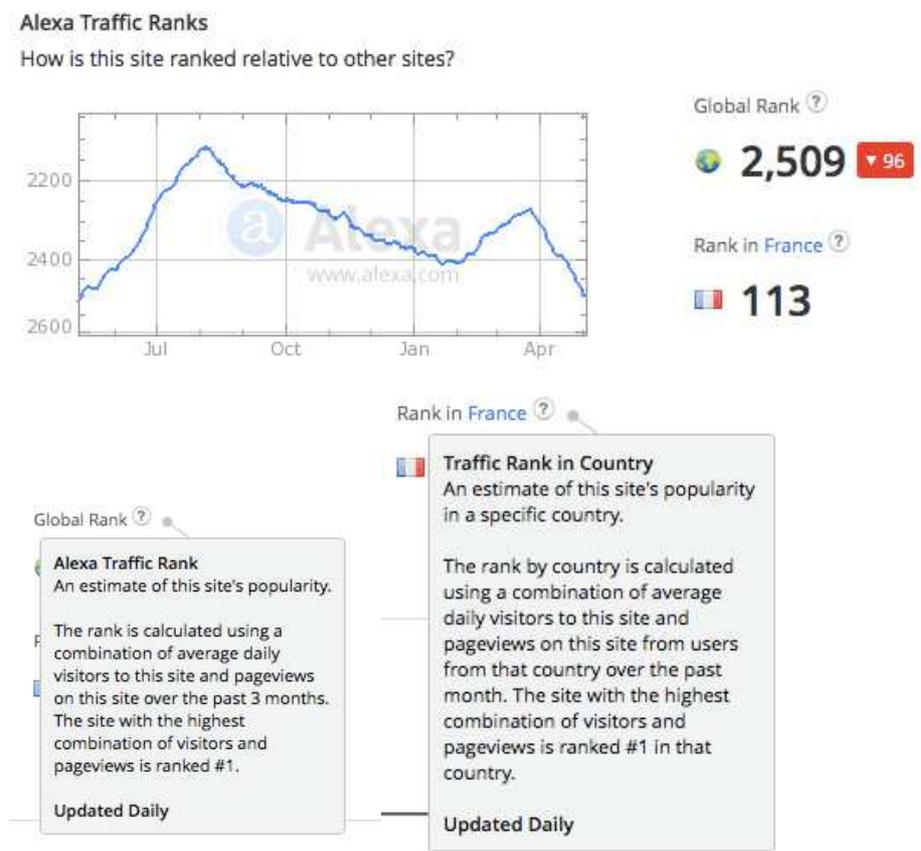


Fig. 3: Traffic rank – Source <http://www.alexa.com/siteinfo/doctissimo.fr>

4.2. Medicaments.gouv



Fig. 4: A public database platform

This public database is accessible on Internet since the end of 2013. It was realised by the French National Agency for Medicine and health products Security: “*Agence Nationale de Sécurité du Médicament et des Produits de Santé*” (ANSM) in relation with the High Healthcare Authority: “*Haute Autorité de Santé*” (HAS) and the National Union of the healthcare insurance funds: “*Union Nationale des Caisses d'Assurance Maladie*” (UNCAM).

The Internet access is either from the name of the medicine, or from the active substances that compose it. It provides updated information to everyone about medicines that are or were commercialised for the last three years: their composition, therapeutic indications, generic medicine group, active substances composition, presentation for distribution, prescription conditions, price and reimbursement rates, and the medical result, in French called “*Service Médical Rendu: SMR*”.

The Internet publication of such detailed, easy to find, and official information takes part in enhancing the responsible process in self-medication and accurate use of medicine, under the current circumstances where patients are more and more involved for their healthcare.

Furthermore, the frequentation of this platform can lead patients to more implication, as they can directly submit undesirable medicine effects: actually, it is possible to download a form, fulfil a declaration and then send it by e-mail to the centre for drug safety of their region: “*Centre Régional de Pharmacovigilance CRPV*”.

With the « Medicaments.gouv » application on smartphone, the flash codes on medicine wrappings can be scanned for direct access to the corresponding information form of this medicine in the data base.

One year after its public diffusion, the database included more than 12 000 references for pharmaceutical specialities and 7 millions of pages had been read by 900 000 people in one year.

4.3. Mondocteur

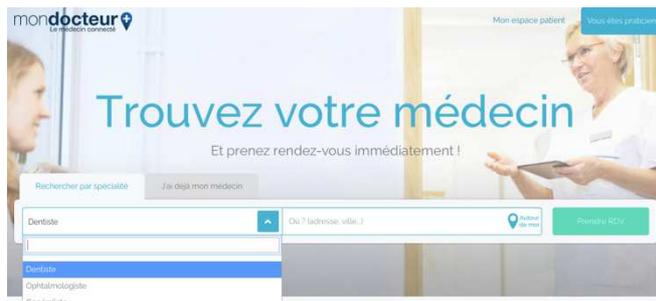


Fig. 5: A private medical booking

Mondocteur was launched by a start-up in 2013 and bought at the end of the same year by the “Lagardère Group”: it was integrated in addition to doctissimo.fr, providing new services for doctors with the means to optimise their diary, reducing the number of forgotten appointments and giving the opportunity to replace cancelled appointments. After beginning for Paris only, Mondocteur is now extended to 250 French towns with 5000 doctors’ offices and is said to have 10 millions unique visitors per month.

As connecting on Mondocteur, under the headline “*le médecin connecté*” (“the connected doctor”), the first choice is the speciality amid a long list. After fulfilling the localisation, it is also possible to choose the type of consultation: vaccination, paediatric consultation, medical certificate or emergency.

Then, asking for an appointment leads to a map, which displays the places of different doctors’ consulting offices. For each of them, photos and general information are available, with the type of consultation rate: “secteur 1”, or “secteur 2” where over-charged fees have to be paid.

As clicking in this part, even more detailed information are given on a separate window with the rates of the most frequent medical acts and treatments for each doctor. Much additional information then appears about the selected doctor: spoken languages, training and diploma, resume and publications.

Before choosing the day and the hour for an appointment, the reason of the visit has to be chosen in another drop-down list with the following items: disease (fever, pains...), vaccination, paediatric consultation, medical certificate, emergency, annual control, high blood pressure, diabetes, articular pains, asthma, bronchitis, skin problem.

Information about public transports for going to the consultation is available, with distances from the consulting room to the nearer underground or bus stations. After booking, the patients receive by e-mail the confirmation of their appointment; before the consultation, a text message reminder prevents them from forgetting it. This functionality is important as it meets the need of the practitioners, avoiding them spaces in their daytime. A digital space is offered to patients after creating their own accounts.

A significant evolution occurred last April when this booking platform integrated Uber services: it is now quite easy in one click to order a car for going to the appointment: this is directly feasible from the reminder text message received for the appointment,

saving from going to the Uber App. Another keynote to point out is the coming up of other comparable services. According to an opinion poll realised by Ipsos last May among French population, the more used apps are those for medical appointment reminders (26%).

4.4. Cancer Contribution



Fig. 6: An associative patients' community platform

Displayed with a drop down list, the platform is based on four main lines: identity: “*Nous sommes*” (Who we are), information: “*Je m’informe*” (I inquire), implication: “*Je participe*” (I participate in) and the network actions: “*Nous agissons*”(We act).

Created by a patient, it belongs to the patient’s community’s type of platforms. Identity is described through four items: our mission, association, ambassadors and partners. The mission presents the aim of gathering on the platform all actors affected by cancer, as well patients, doctors, associations and people with political responsibilities. The objective is to make them participate to the co-construction of a new vision of the cancer and its impacts on society.

The platform exists since 2011 and is managed by an association. Some members are patients’ associations as the association for young people, solidarity and cancer: “*Association Jeunes Solidarités Cancer*”. According to the presentation of the platform, there are more than 2500 people in the community, with 100 000 viewed pages per year and 4000 visitors per month.

The heading “*Je m’informe*” (“I inquire”) is composed by three accesses: articles, newsletters or directory. Articles include interviews and videos, and directories lead to book, film, website and blog lists. Three means of implication are proposed on the heading “*Je participe*” (I participate in”): forum, vote and meetings. The forum is structured around more than 15 existing entries such as: screening, relation between patients and the nursing staff, disease announcement...

For voting, the possibilities are surveys or polls: for instance, patients are asked for a call to participation about survey on oral chemotherapy in the context of a research project. Another example is a survey carried out by a regional cancer treatment centre: “*Centre régional de Lutte contre le Cancer*” on the theme: information seeking about cancer and environment.

“*Nous agissons*” (we act) is the way to present thematic reports, to collect signatures for petitions, and describe the current projects and their results. Opinions and patients’ experiments can be expressed and shared if a personal account has been created on the platform.

The platform is characterised by a wide scope of news and current themes that can be activated in a drop-down structure: patients can have interactions on many of them as they are asked for their experiences.

4.5. MyCurie



Fig. 7: A hospital platform for personalised care pathway

The Institut Curie is a public foundation and centre for treatment of cancer. The app MyCurie has been developed for providing the patients of the Curie Institute to get personal information.

Patients access to the MyCurie with either a smartphone, a tablet or a computer. Personal data security has been specially examined for this platform designed for patients in mobility, with access to information from the Institute. The objective fixed upon the development of the app is accompanying every patient along his healthcare pathway. Patients can get medical and practical information as their next appointments, some pedagogic videos or personalised information about their treatments.

After a period of tests by patients, the Institut Curie intends to extend the use of the app to many patients and to add new functionalities. For instance, it is planned to display medical reports, or new specific units for each type of cancer. Some personalised advice and coaching could be added, then, individual information about side effects. Over a second phase, the Institut Curie plans to push information to general practitioners with special access to medical information.

4.6. Comparhospit



Fig. 8: A mutual fund group platform for hospital comparisons

This platform is on line since 2010 on the website of the mutual fund group Malakoff Médéric, in order to enable patients to get information for their selection and decision about the choice of a hospital corresponding to their criteria, standards and requirements. As explained on the platform, the information is posted from public databases such as the annual statistic of hospitals: “*Statistique Annuelle des Etablissements de santé*” (SAE), the national file of healthcare and social structures: “*Fichier national des établissements sanitaires et sociaux*” (FINESS), the medical program for information system: “*Programme de Médicalisation des Systèmes d’Information*” (PMSI) and indicators from the French high healthcare authority: “*Haute Autorité de Santé*” (HAS).

After the location, a first selection is done through three pull-down menus for choosing medical activity, speciality (surgery, maternity, psychiatry...) and reason. It is also possible to select equipment as a scanner or magnetic resonance imaging (MRI),etc.

As results, hospitals corresponding to the criteria are displayed under a banner, with possible access to a detailed form for each structure. A table gives specifications about: the hospital, the average stay duration, the number of stays per year, the rate for ambulatory stays, the level in quality certification with indicators of fight against hospital-acquired infections, the score IPAQSS: indicators for the improvement of the quality and security of care, patients’ opinions and the price for individual room.

ÉTABLISSEMENT	DURÉE MOYENNE DE SÉJOUR (JOURS)	NOMBRE DE SÉJOURS PAR AN	% SÉJOURS AMBULATOIRES	NIVEAU DE CERTIFICATION	SCORE IPAQSS	AVIS PATIENTS	PRIX CHAMBRE INDIVIDUELLE
?	?	?	?	?	?	?	?

Fig. 9: Information items for each selected hospital

Every patient can express his opinion. Those who are also clients of the mutual fund group can access to a simulator for an estimation of hospital living expenses and remaining costs for patients.

Other platforms offer comparable services, namely « Hospitalidee »... The French high healthcare agency: “*Haute Autorité de Santé*” has also implemented a platform for collecting patients’ opinion after their hospital stays. Patients receive a form by e-mail and can answer to questions about the welcome in the structure, the support provided (waiting periods, privacy, pain management), the quality (bedrooms and meals) and the exit preparation. Combining those data, a satisfaction score is calculated and published on the public platform Scopesanté.

4.7. Diabète LAB



Fig. 10: A living lab with patients' involvement as experts

In 2015, the French Diabetics Federation: “*Fédération Française des Diabétiques*” decided to launch the Diabète Lab for innovation that could be thought, developed and evaluated by the patients, considering that patients are well placed for expressing their needs. Diabète Lab aims to organise the different contributions from doctors, industrials, patients' associations, federations and healthcare authorities.

The process is organised along three steps: collection of ideas based on the needs, co-construction for developing products and services which could be adapted to the patients' current needs and uses. Therefore, patients are implicated from the first idea to the prototype; some volunteers can be requested to test innovative devices. Finally, products and services matching the patients' expectations could get a label.

Diabète Lab is now developing an app for collecting the diabetic patients' needs directly on smartphones. The functionalities will include glycaemia monitoring, help for preparing medical consultations and dietetic advice.

4.8. Bepatient

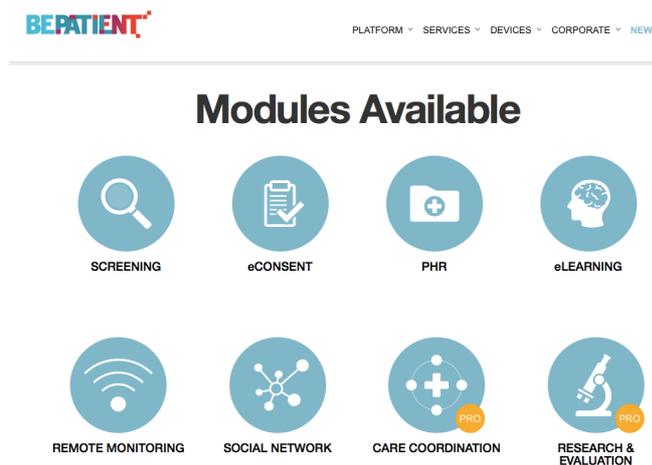


Fig. 11: A platform structure for including patients in medical research

The platform Bepatient appeared in France in 2012 with a complete offer on chronic disease management, after Carecity in 2011 and on the model of Patients like me in the United States. As an e-patient centric platform, it offers solutions for improving the patient pathway and provides a global, personalised and participative approach to patients with the use of decision-making tools.

The intended goal is to enable chronic patients to meet and exchange about their daily experiments, their disease and treatments, and acquire more information for getting more involved in their healthcare. As helping the patients to follow their disease, prevention of complications might be expanded. Patients can manage their own digital healthcare record booklet, using connected devices like the iHealth tensiometer.

The platform is created as a bunch of complementary services: medical scores, monitoring tools, information centralised from biomarkers, videos, coaching, fo-

rums... any help for getting information about chronic diseases and patients' rights. The bunch of services is based on different units to configure: screening in interaction with practitioners, patients' e-consent for getting information about their care pathway and their treatment, personal health record, remote monitoring for uploading healthcare data to the platform and sharing them remotely, care coordination, uses observatory, etc. It includes customised disease management programs and solutions for patient data analysis.

It has been developed in relation with research for realizing applications centred on digital patients communities and for using shared information in medical research where patients can play a part. Patients can be required as experts and participate to trainings for patients' therapeutic education. Patients can access to programs managed by healthcare professionals in medical device or pharmaceutical groups or projects for risk management by insurance groups.

Two surveys about remote medicine for heart failure have been carried out with Bepatient in relation with two French hospitals and Alère, a company specialised in diagnosis systems.

5. Interactions between patients' needs and digital services

The digital platforms could be classified according to their target audience or the provided services, but this overview points out the level in patients' involvement for their healthcare as the main factor.

Types of healthcare digital platforms	Audience	Services	
Healthcare information digital platforms <ul style="list-style-type: none"> • Doctissimo • Médicaments.gouv • Mondocteur • Cancercontribution • myCurie • Comparhospit • Diabete Lab • Be patient • ... • Platform for healthcare information public service: Service public d'information de santé 	General audience Patients groups according to their pathologies, specific patients	Information Free services More and more diverse services	Typology based on the users' degree of implication <ul style="list-style-type: none"> • Searching for information, • Interact with others, expressing themselves • Recording some general data (for medical booking), • Sharing personal experiments, • Exchanging with medical professionals, • Expressing their needs, • Evaluating products or services, • Sharing healthcare data
Platforms for remote healthcare advice ("téléconseil") or remote	Subscribers	Fees for services	

medical appointments (“télé-consultations”) <ul style="list-style-type: none"> • MesDocteurs • Deuxièmeavis • MédecinDirect • ... 			
Territorial support platforms: plateformes territoriales d’appui (PTA)	- Medical professionals	Coordination	
Healthcare national insurance fund platforms <ul style="list-style-type: none"> • Sophia • Prado ... 	Diabetic patients Patients after hospitalisation	Support for patients Phone advice Monitoring Coaching House calls	

Patients willingly head towards services providing direct appointment on line and share their own experiments about their disease.

They look for more and more appropriate information and for specialized healthcare social networks or sites dedicated to a disease in particular.

Creating their own accounts on platforms, patients can get more customised information services. Broadcasting healthcare and medical reliable information on line as a quality documentary service enables patients to act as more responsible actors. With platforms, ICT has changed the relation between practitioners and patients who go to a medical consultation with previous information.

Patients now tend to make their own medical diagnosis and use information for decision making in self-medication. The concept of participative healthcare becomes widely spread thanks to the use of digital technology.

Healthcare insurance companies try to have an effect on healthcare expenses, encouraging prevention and monitoring, providing advice and coaching services to their clients.

Making comparisons between hospitalisation conditions also raises awareness on possible choices.

Expressing their needs, testing solutions as experts, and sharing some of their data, patients tend to move towards a deeper implication.

6. Evolutions in healthcare digital platforms

Rapid technological evolutions are observed, and they have effects on digital uses.

For instance, platforms are more than a group of web pages: they now display more videos, or games with the gamification process.

Services on digital platforms are accessible from all devices with responsive web design.

Data from connected devices can now be integrated.

Such evolutions take place in a context of lack of legal frame and control for the development of healthcare platforms.

Label like Health On Net (HON) is not widely applied, while some companies as Medappcare or DMD have put a position in evaluating apps with an approach of quality label.

A multiplication of healthcare digital platforms can be observed, as well as the diversification of provided services.

For instance, the French healthcare insurance mutual fund: “*Caisse Nationale d’Assurance Maladie*” (CNAM) displays information for patients on its website Ameli and launched last April a new app called “*Annuaire Santé*” with information from its databases about care offers: seventy medical specialities, practitioners and hospitals locations, rates and opening hours: the click-to-call functionality enable direct medical booking.

In this situation, several interrogations appear about current digital uses: How patients determine themselves for choosing a healthcare platform between similar ones? Do they prefer to find a complete bunch of services on one platform? Do they browse different platforms or mainly some of them? What is their browsing frequency? Etc.

Furthermore, some platforms will now gather services from different providers. An example was given with Uber services on Mondocteur. It will also represent an important added value for some public territorial platforms: “*Plateformes Territoriales d’Appui*” (PTA), which will gather different medical booking services.

« Government is a convener and an enabler rather than the first mover of civic action (...) Government as a platform provider created capabilities that enrich the possibilities for subsequent private sector investment » (O’Reilly, 2010)

7. Conclusion

This paper corresponds to a work in progress. We propose different tracks from reflections around experiments, which we are associated.

This approach opens the way to several tracks for search.

We will draw some distinctive features in the part played by e-patients currently in the French health system, with the effects of the tendency in appropriation of health topics by patients' associations.

Through different ways in the e-patients' empowerment, we will highlight the special effect of the patients' emotions and feelings on the evolution of the health system.

Characterizing the innovative concept of e-patient will enable to analyse its interaction with the emergence of different types of web platforms and in specific situations.

The e-patients' needs require new forms of organisation, with more immediate responses and proximity, which leads to territorial fields for innovative experiments, such as the French program for digital care territories: "*Territoires de Soins Numériques*" (TSN) in five French regions.

Thus the on going process of extended health services fields through digital platforms in relation with the patients' expression of needs is deemed to be analysed deeper.

And finally some results on the healthcare system improvements can be pointed out especially in the evolution of care pathways approach.

Digital is now fully integrated in the participative healthcare and it creates value, helping patients to take their position in their healthcare pathway and perform an active role.

In the context of a very rapid development of online healthcare information, patients would now need better online tools to make health decisions. A new step and real improvement would consist in providing on platforms better helps to patients for sorting relevant information, which could be really appropriate to their situation, either for diagnosis or prevention. This approach requires analysing what and how patients are researching on line.

Actually, the relevant issue for the healthcare system actors is not to head towards the regulation and / or the deregulation, towards lucrative or free services, or towards the ICT use or their refusal, but how to use the digital technologies as an opportunity for taking better care of the patients, providing new services to them rather than enduring the technologies and the models proposed by the applications publishing companies. The digital transformation in this sector has to be directed with an analysis of the risks and the issues in relation to the different technologies employed, as it is done for the autonomous car (Ologeanu-Taddei, Morquin, 2016).

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