

How Social Media Platform can Support Value Cocreation Activities in Healthcare

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Abstract

The purpose of this paper is to analyse how healthcare organizations use social media platform to facilitate value co-creation processes. In the last decade, healthcare system and researchers have recognized patients more active role in co-creating the healthcare service experience. The centrality of patients is emphasised within Service Dominant Logic as they are viewed as both co-creators of value and also resource integrators. In order to understand how healthcare organizations are adopting social media technologies to address the challenges they face, the paper presents the results of a content analysis of comments, information and videos posted on the Facebook pages of an Italian healthcare organization. Although there are high expectations that the use of social media will provide more patient centred care, there is currently little evidence within the academic literature showing the health benefits of the use of social media by patients and healthcare institutions. The findings of this study have important implications for public healthcare organizations in order to understand how implement social media platform and establish procedures to facilitate the value co-creation process.

KeyWords

Value co-creation, social media, patients' engagement, public health communication

1. Introduction

The use of social media, such as Facebook, Twitter and You Tube, is part of a growing trend and is due to a realization that healthcare institutions need to be more engaged with their patients in order to facilitate the value co-creation process. In particular, fundamental role of the new technologies that, by facilitating the value co-creation process, can create a smarter, more connected healthcare system able to provide better assistance, anticipate and prevent illness and allow people to make better and more responsible choices (Spohrer & Maglio, 2008; Carrubbo et al., 2015; Gkoulalas-Divanis et al., 2014). The term social media denotes highly interactive platforms via which individuals and communities share, co-create, discuss, and modify user-generated content (Househ, 2013) Heldman A.B. et.al., 2013). Interactivity refers to "the condition of communication in which simultaneous and continuous exchanges occur, and these exchanges carry a social, binding force" (Fisher & Clayton, 2012). The expanding use of social media platform make possible new ways of searching and sharing health information, provide new collaborative health care opportunities¹. Since then, the use of social media in the field of health has grown exponentially². Through digital social media, healthcare organizations can offer its patients/citizens new opportunities to take an active role in value creation processes as well as to engage in dialogue with healthcare institution during the stages of service configuration and delivery, including information search, fulfilment, and consumption (Prahalad & Ramaswamy, 2004, Payne, Storbacka, & Frow, 2008). This process is referred to as co-creation and is considered to be an important manifestation of patients engagement behavior and quality improvement. Traditionally, the patients were considered a passive recipients of complex services (McColl Kennedy et al. 2012). However, in the last few years, the idea that patients should be at the centre of the health-care system has become a topical issue at the international level. There is growing realization that, rather than being passive recipients of services, patients are active engaging in a range of interactions and activities to co-create value (McColl Kennedy, H. S., 2017). Despite patient value, co-creation in healthcare is still a relatively recent phenomenon, it is likely to have important implications for health care organizations as they continue to seek new ways to reduce costs and improve the service quality (Bonomi, S. et. Al., 2015). In this context, co-creation is understood as an active process, creative, society based on the collaboration between health care organizations and audiences (patients, family and other stakeholders), and that should ideally lead to the generation of value for all parties.

These perspectives were introduced by the Service-Dominant Logic (SDL)(Vargo and Lusch, 2004), which defines value co-creation as "the joint, collaborative, concurrent, peer-like process of producing new value, both materially and symbolically". Recently, healthcare institutions are recognizing the power of the social media as a platform for co-creating value with their audiences (Kaplan & Haenlein, 2010). Social media platform allow health

¹ Since the end of the 2000s, the practice of searching for information on the Internet has become increasingly widespread, and in this context social media has played an increasing role, including online forums and bulletin boards, used as sources of information on health and well-being. In this regard consider that according to a Pew Research Center survey, the "60% of US adults used the Internet to find health care information, and 10% used social media to follow their friends' health care experiences". Fox S. The social life of health information 2011. Pew Research Center. Available at: http://www.pewinternet.org/files/old-media/Files/Reports/2011/PIP_Social_Life_of_Health_Info.pdf. Accessed May 13, 2017. Another study useful to take awareness of the phenomena is Elkin N. How America searches: health and wellness. iCrossing. Available at: http://www.rx-edge.com/research%20pdfs/How_America_Searches_Health_and_Wellness.pdf. Accessed May 13, 2017.

² 30 facts & statistics on social media and healthcare. referralMD. Available at: <https://getreferralmd.com/2017/01/30-facts-statistics-onsocial-media-and-healthcare/>. Accessed May 14, 2017.

organizations to engage in conversations with its audience and, specifically, citizens through unique interactive feature, such as sharing videos, photos, commenting on platforms like Facebook or Twitter. Some scholar (Barry, 2010) point out that hospitals across the country using social media with different aims like as supply information to a general audience, provide informations about news services or events and promote health. Among these, patients appear to become more engaged with their care in general, and one of the many results is that they are increasingly using the Internet to share their experiences of health care, to interact with others having similar illnesses and to manage their illnesses by leveraging these technologies (Heldman et.al., 2013; Kotsenas et.al., 2017).

Starting from these reasons, recently the national and local governments in Italy is doing pressure on health care organizations to understand how well they can promote the health of their population and to reconfigure their service delivery processes by the use of the information and communication technology (Sorrentino et.al., 2016; Zardini et.al., 2016). The Ministry of Health suggests to the local health institutions, within the guidelines for the on-line communication published in 2010, the use of social media platforms for planning communication activities to obtain more effective health promotion and to establish with the citizens more engaging and dialogical relations. In the last few years, an increasing number of health organizations in Italy have come up with Facebook health applications for facilitating brand awareness and promoting brand engagement (Househ, 2013). In particular, healthcare organizations in Italy use social media as part of various community engagement activities, such as fundraising, customer service and support, the provision of news and information, patient education, and advertising new services. Despite the importance of the use of social media, little has been published about its role in the value co-creation process. While online health information seeking has received much credence in research, most studies have focused on information seeking behaviours (Fiksdal et al., 2014; Silver, 2015). Others have examined the influence of health information seeking on specific disease conditions (Jamal et al., 2015), and health literacy among patients (Berkman et al., 2011; Gutierrez et al., 2014). Consequently, empirical research to ascertain how online health information seeking influences the consultation process, which in effect could impact on the expected health outcomes leading to co-creation of value is scarce.

Starting from the growing use of social media in healthcare, the purpose of this paper is to examine how the use of the most widespread platforms, as Facebook and twitter influences the ability of health care organizations to create opportunities for engage patients but also families and citizens in value co-creation activities. Specifically, we explore how these tools are used by healthcare organizations as a mechanism for engaging audiences in true multi way interaction. The healthcare context offers an ideal setting in which to study the role of social media platform, as it supports interactions among patients, citizens and providers.

To reply the research questions, an explorative qualitative analysis, was carried out through the content represented by texts, and videos posted on the Facebook pages of an Italian healthcare organization. In particular, we analyzed the postings of a University Hospital, in relation to some of the objectives pursued by this communication, to analyze their ability to generate engagement by users, measured in terms of likes, sharing of posts and comments to post. This study contributes to co-creation literature by being one of the first to consider social media platform as tool to promote value co-creation activities in healthcare context. Importantly, this study provides healthcare practitioners some directions in order to co-create value with the support of social media platforms.

The rest of the paper is organised as follows. First, the theoretical background of the study

is explained along with a review of relevant literature and proposed hypotheses. Next, the research methodology employed is detailed. Finally, we provide a summary of the key findings and discuss the implications for healthcare organizations.

2. Theoretical background

2.1 *Value co-creation in healthcare*

Until a few years ago, healthcare systems have considered customers as passive recipients of health services rather than being a active subject (McColl-Kennedy et al., 2012). In the last decade, with rising healthcare costs, increasing customers demand for more personalized and better care, healthcare systems have recognised the centrality of patients in co-creating healthcare service experience. This new paradigm is emphasised within Service Dominant Logic (Vargo and Lusch, 2004). In this context, Service dominant logic (SDL) sheds more light on patient inclusion in the service production and creation of value. This approach conceptualizes value co-creation as a process in which different actors exchange resources and jointly create value. Consequently, the actors' knowledge in the service exchange and sharing of information is central to SDL and value co-creation (McColl-Kennedy et.al, 2012; Vargo & Lusch, 2012). McColl-Kennedy and colleagues (2012) define customer value co-creation as “activities with self or in collaboration with members of the service delivery network including family, friends, other patients, health professionals and the outside community and involves a variety of activities that customers carry out to co-create service value”. These activities include for example some co-creative behaviours like as information research and collation, changing habits, sharing information and provide feedbacks, developing relationships and regulating emotions. The emphasis is upon the value (benefit to some party) that is co-created through the interactions and activities of patients with service providers. Resource integration is viewed as an opportunity for creating new potential resources, which during service exchange can be used to ‘access additional resources’ and create new resources (which can also be exchanged) through integration (Vargo & Lusch, 2011; Vargo & Lusch, 2012). Previous literature point out that through this process of creating value by sharing and integrating resources, actors potentially develop new skills and engage in learning loops that enrich their engagement in future co-creation activities (Payne et. Al. 2008). In the service dominant logic perspective, the healthcare organizations have to adopt co-creative behaviours and activities that facilitate and promote value co-creation by multiple actors. These activities require to healthcare organizations to include customers in the life of the organization and to recognize the importance of the interactions about actors in order to create value (Corlett & Twycross, 2006; Ballantyne, D., & Varey, R. J. (2006). The success of co-creation is founded on the ability to create an environment of interaction in which participants feel free to engage in conversations and activities that are of personal interest and enabling them to develop their sense of belonging. In this context the value co-created comes from the perceived value by actors that interact each other through a deep dialogue, sharing information, experiences being able to be responsible for the care path, and finally increasing the trust level by an even more clear relationship (Hibbard J., Green J., 2007). Interpersonal interaction increases open communication, in this way, patients and families are motivated to participate in engagement behaviours through encouragement from others, such as providers, and through positive feedback when they engage in these desired behaviours (McColl Kennedy, 2017). Healthcare organizations have to encourage patients to take an active role as key players in protecting their health and choosing

appropriate treatments for managing their disease (Rafaeli & Sudweeks, 1997). To make an example through interventions direct at modifying patient medication compliance, chronic disease self-management, interventions directed encouraging patients to ask questions through social platform and traditional behaviours associated with promoting health and preventing disease. Multifaceted information from healthcare providers includes verbal explanations, visual diagrams, pamphlets, book recommendations, credible online sources, question-and-answer sessions, and other creative avenues for information sharing.

2.2 *Social media as platform for value co-creation process*

Contributions based on Service Science analyse the fundamental role of the new technologies that, by facilitating the value co-creation process, can create a smarter, more connected healthcare system able to provide better assistance, anticipate and prevent illness and allow people to make better and more responsible choices (Spohrer & Maglio, 2008; Carrubbo et al., 2015; Gkoulalas-Divanis et al., 2014). In particular, the emergence of social media has generated profound changes in the processes of sharing, in creating and promoting contents. Social media has been characterized as mutually beneficial for public health organizations and their audiences to connect to each other in ways that promote a “common good”. Heldman et al. (2013) defined social media engagement as “a multi-way interaction between and among an organization and digital communities that could take many forms, using social media channels to facilitate that interaction”. Many authors emphasize the importance of social media platforms which represent an important source of information for patients. They provide new form of interaction that makes the service available in a continuous manner, making possible forms of value that would not be available in a traditional healthcare system based on sporadic relations between operators and patients (Loane and Webster, 2014; Karjaluo & Rantala, 2017; Van Oerle et al., 2016). Through social media platform, healthcare institution, create a venue in which actors can interact and exchange resources to create joint value. Social media platforms can promote a relationship between healthcare institution and its audiences at each stage of the value co-creation process, including information search, service configuration, fulfillment, and consumption (Kane et al., 2009; Kaplan & Haenlein, 2010; Ramaswamy, 2008). In particular, one key value health social media platform provide is the possibility to interact with others in similar health situations and share informations about conditions, symptoms and treatments. This collective learning can be leveraged and shared to help individuals make decisions and provide an emotional support (Libai et al., 2010). For example, patients can make their experiences feedback, including response to drugs, available as public resources. In this way, patients can benefit from the experiences of other patients who share their experience on social media platform (Hoyer et al., 2010; Nambisan & Nambisan, 2009). Studies have shown that patients through social media can, not only, to share their experiences through discussion forums, chat rooms and instant messaging, or online consultation with a qualified clinician but they can also express themselves, share their stories, learn from others and spread health knowledge (Lober & Flowers, 2011). A health conditions is a particularly strong affinity and the collective learning and experience of others can be leveraged and shared to help individuals make decisions (Kotsenas et al, 2017). Patients could describe and share their emotional perspectives and provide necessary coping skills, support, and resources for other patients. Healthcare organizations can engage audiences in value co-creation processes in several ways. In the case of new service development or ideation phase, healthcare institutions can use social media in order to involve their audiences in the stages of the service generation process and engage audiences in a dialogue. Moreover, patients/citizens especially create value for a

healthcare organization when they provide feedback on new services as well as possible improvements to existing offerings (Kumar et al., 2010). From a health promotion perspective, these conversations can lead to varying levels of engagement. They can result in a range of outcomes, including increased awareness or knowledge of health-related information, feelings of belonging and social connection, and involvement with health promotion programs (Hoyer et. Al., 2010; Nambisan & Nambisan, 2008). Healthcare institutions can actively monitor feedback from audiences through social media to understand how is possible improving services. Feedback mechanisms, such as buttons or quizzes, facilitate more participation from users of social media and encourage a discussion among users with relatively few access or content creation barriers. Heldman et al. (2013) point out that social media monitoring tools allow public health organizations to learn more about what diverse audiences are saying regarding public health topics, identify information gaps, and adjust messaging accordingly. Social media give us insights into what health information may be important and interesting to users, in the moment. This real-time aspect of social media is a key component to ensuring that the communication efforts are relevant, meaningful, and useful to audiences. Now, if the value of any experience is generated in the interaction between the actors, in their ability to involve each other in a relationship, it can thus understand how social media can offer a great opportunity for the development of these relationships. Clearly, the use of social media within a strategic plan, prepared by the various health organizations, presupposes the definition of specific objectives that then must be monitored and measured based on appropriate indicators, such as, for example, reach, click- through rates, impressions, posts, and followers must be tracked, interpreted, and documented relative to targets for each initiative.

3. Research Method

In this study, with the analysis co-creation activities in a health social network context, we investigated how a healthcare institution uses social media in order to engage with its audiences and we explained how healthcare co-create value with patients. A case study (Yin, 2014) was conducted to explore the research question of this study. The case we have considered is the online social platforms, of an Italian healthcare organization located in Sardinian region. A content analysis has been developed and, following Miles and Huberman (1994), a list of codes defined from the literature was created prior to define the fieldwork to guide the analysis. Defining coding as the organisation of raw data into conceptual categories, each code is effectively a category or ‘bin’ into which a piece of data is placed.

3.1 *The study context*

Healthcare organization aims to make citizens, patients and their family members as protagonists within the health service with the objective to improve health outcomes and contributing to make the health system more effective. As it is well reported in literature (Sharma and Conduit 2016; McColl Kennedy et al. 2012; Ramaswamy and Gouillart, 2010) an organization with a co-creation culture manages to achieve effective dialogue by creating platforms for interaction and two-way communication. Social web platform in particular, represent a venue to foster interaction between actors involved in the service provision and stimulate value co-creation. The Social web platforms analysed belongs to the Azienda

Ospedaliera of Cagliari (AOU)³, which, in line with the European *e*Government Action Plan 2011-2015, since January 2017 it has implemented a communication Plan that concern a renovation of the main digital communication platforms (Facebook, Tweeter and Instagram).

The European Commission indeed, calls on public administrations of all levels to become open, accessible and transparent to citizens. There is a relevant commitment of the AOU regarding this aspect: the institutional website has been renewed, focusing on social media and it has integrated all the Digital Healthcare facilities. The goal of the organisation is to keep focusing on all these aspects, enhancing the information technologies tools and online services available to users. Specifically, referring to social media, the AOU's presence on social networks is relevant. The Facebook page, is highly active, as well as Twitter page, Youtube channel and the Instagram profile.

It is worth mentioning, that the Facebook page of the AOU was followed by 6567 in November 2016 fans reaching 9581 fans on November 2017 in only one year. At the end of June 2018 the Facebook profile reached 11.638 followers with a relevant increase of the contents posted by the organisations and by users on the page. Initially, the social media channel and, in particular the Facebook page of the AOU, was simply used to promote health services or "administrative" information (press releases, news). It was not enough used for engaging patients neither exploited as a tool to co-create value with users. Conversely, for the AOU, the communication with citizens is not just promotion about services and the company but rather health promotion and the stimulation of interaction with the organization and among patients, after the implementation of the new communication plan in 2017.

Concerning the case study it has been selected the Facebook page as the unit of analysis, and more specifically the content analysis has been conducted on the AOU posted messages and on the users comments and reaction.

The Facebook page has been chosen as the social media platform to be analysed deeply considering that in Italy, by 2015, 28 million Facebook users were active every month, 8 millions of Instagram users and 6.4 million Twitter users (Audiweb). Furthermore, concerning the context of this study, the same contents of the Facebook page were published on the Twitter and Instagram account. In particular several studies highlighted the importance of Facebook in connecting patients, developing interaction and in promoting health. It can constitute a valid and effective platform where patients search for health information and develop value co-creation activities (Miles M.B. & Huberman A.M. 1994).

3.2 Data collection and the coding procedure

A browser application of NVivo software, NCapture, has been used to collect all multimedia contents shared into AOU official Facebook page since the beginning of 2017 until May 2018. The period studied covers one year and five months after the introduction of the new communication Plan. Thanks to this tool, we gathered a rich collection of data from January 2017 to Jun 2018, which allowed us to analyse value co-creation activities from the perspective of users and the perspective of the health organisation. In particular through the coding procedure, we have investigated how the organisation can co-create value with patients on a social web platform studying the value co-creation activities of users and which are the different ways that the company used with the aim to engage patient and co-create value.

At first the comments of patients have been coded in relation to the different value co-creation activities of users according to McColl-Kennedy et al (2012) framework. Then, all the posted messages by AOU has been coded too in relation to the different support activities and engagement actions which can be implemented by managers to enhance value co-creation and interactions with patients in their organisation.

³ The AOU is leader in Sardinian region in health communication, thanks to the number of online communication platforms it uses which the AOU has been able to integrate. AOU of Cagliari is the first in Sardinia and one of the first in Italy to use of all the devices (pcs, tablets and smartphones) for patient services: from the withdrawal report, going for online booking, and dialogue with the administration.

Another source of data on the page was the amount of page reviews by different users. These are very significant data to be coded and studied because they represent the autonomous and spontaneous contribution of citizens willing to interact and leave its opinion.

Data collected consist mainly in posts, photos, links, tags, videos, comments posted on the Facebook wall and the company's replies to its clients' comments. With reference to the users, a descriptive analysis has been provided regarding different reactions to the different post. The number of the most relevant reaction indicators in terms of like, number of posts and sharing have been evaluated (Neiger et.al., 2012), not only referring to the patient engagement but also in relation to some co-creation activities. In the next paragraph the coding procedure will be explained considering the former literature that served as the basis for the value co-creation activities model in a social media platform. All the post of the AOU and the comments of users on the Facebook page served as the coding units of analysis for this study. Before the actual content analysis, to avoid observation bias driven by a researcher's expectations, two trained coders, independently coded a sample of 150 Post and 500 comments, in order to evaluate coherence between the coding processes performed by the two co-authors, and consequently evaluate the robustness of the analysis.

The coding categories were developed based on previous literature in management studies and in particular in value co-creation under the domain of SDL (McColl-Kennedy et.al., 2012; Botti et.al., 2017; Tomasetti et.al., 2015; Sharma & Conduit, 2016;) and they were modified to fit the context of health in a Facebook page when necessary. More specifically, the coding procedure has been developed through a two-step path. In the first step the coding's procedure aim to identify the different categories of messages describing the users value co-creation activities implemented on the social media institutional Facebook page belonging to the healthcare tertiary hospital. For this purpose, a model from the literature review from SDL and SL has been used to identify which are the collaborative activities that involve user in value co-creation in not specified context. Therefore, the activities of the model have to be adapted in order to fit a social media context. As some authors reported in literature how health related organisations make use of interactive features and social media channels on Facebook (Miles & Huberman, 1994), we have revised which are the user activities that can be observed in a social platform context. Nine main categories have been identified for this classification (Tab.2)

Tab. 2 Category of users value co-creation activities on the social web platform

Value co-creation activities	Subcategory	Description	Expected/
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Cerebral Activities	<p>Positive attitude</p> <p>Tolerance</p> <p>Expectations</p> <p>Mutual Trust</p> <p>Future Intentions</p> <p>Commitment</p>	<p>All of the cerebral activities that psychologically predispose buyers to start service provision (Xie et al. 2008), including users' positive attitudes toward suppliers (Bagozzi 1992), expectations of service success (Cardozo 1965), customers' trust preceding supply and their willingness to tolerate potential inefficiencies , (Yi and Gong 2013).</p>	<p>Post and link related to have a positive attitude, expectation, participating in future activities, trust and tolerance about the service provided by the health organisation.</p>
Information search and collation	<p>Searching Information</p> <p>Sorting and assorting Information</p>	<p>Consisting of a set of basic informative actions carried out by users to better understand service modalities.</p>	<p>Comments related to asking information about health service, or comments and post related to managing health related information</p>
Combination of complementary activity		<p>Consumers' involvement in further activities in addition to the service provision. This includes events or supplementary services related to basic service but not fundamental for supply.</p>	<p>Comments and reactions related to following diets, or taking food supplement and other action complementary to the treatments.</p>
Changing habits	<p>Pragmatic Adapting</p> <p>Change Management</p>	<p>Refers to the way in which service can modify consumers' routines and practices, from a psychological point of view, to manage long-term changes deriving from service and from a behavioral perspective in terms of being able to control these changes.</p>	<p>Post or comments related to Storytelling about daily activities in the hospital, about experiences in the department, but also referred to habits modification in daily life after treatment or diagnosis.</p>
Co-production	<p>Co-development</p> <p>Co-provision</p>	<p>Users' participation both prior to service provision (co-design and co-development of a value proposition; Lusch and Vargo 2014 , Prahalad and Ramaswamy 2004) and simultaneously with service provision</p>	<p>Post and comments related to patients contributions in terms of new ideas, plans and contents.</p> <p>Users comments related to the way they organise the service provision referred to managing their health.</p>
Co-learning	<p>To share resources acknowledged by other actors (information, experiences, expectations, etc.)</p> <p>Feedback</p>	<p>To share information deriving from various sources which are acknowledged by other actors: external, e.g., friends, family, or other customers, or internal, e.g., previous knowledge and competences regarding other members of consumers' service network and health promotion</p>	<p>Post and comments related to reactions and information sharing about health related contents and past experiences on the AOU service which is a knowledge by other actors.</p>

Connection		The bidirectional and dialogic exchange between beneficiaries and suppliers, and between users (Randall et al. 2011, Mele and Polese 2011)	Number of followers and kind of typologies Post related to discussion activated between users and patients, Q&A between users.
Co-advocacy	Organisation quality promotion Organisation service promotion	Individual's voluntary promotion of the firm's interests beyond the individual's own interests (Yi and Gong 2013). Therefore, co-advocacy entails customers working with the organization to actively promote the organization and its service offerings	Comments related to promotion of the AOU services experiences and quality. Sharing posts to promote the organisation services and qualities.

The second phase concerned the identification of different categories of action implemented by the health structure to support patients value cocreation activities. With regards to the patient engagement in value co-creation activities social media sites have become extremely important venues for seeking and exchanging health information, contributing to a tremendous amount of health information available online. Interaction is the conceptual basis of engagement, and value co-creation, thus, the organisation in order to engage patient in value co-creation activities within the social network has to provide and differentiate interaction opportunity.

Therefore, referring to coding, for this step of the analysis, a classification of related action to support value cocreation have been recognised inspired by literature, in particular referring to the study of Sharma and Conduit (2016). These authors define supportive co-creation behaviours as “*resource integration activities that facilitate value cocreation*” (Sharma and Conduit, 2016). Therefore, even if these behaviors are not explicitly tied to a specific purpose or outcome, they represent the resource-integrating activity that facilitates a multitude of outcomes. Hence, user's co-creation activities are basically manifested through the supportive co-creation behaviours. The classification suitable for the health organisation is shown in Tab. 3.

Tab. 3 – Support Activities and Patient Engagement action of the healthcare structure for value co-creation.

Co-creative support behaviour		Description	Expected
Dialog	Involving influencer and key partners	Engaging key partners and public health influencers driving online conversations on health.	Conducting outreach to discuss public health topics with high-level professionals that align with an organization's priorities.
	Responding to questions or comments channels.	Responding to health-related questions and comments—both negative and positive—received through organizational social media channels.	Intervention by the health structure social media manger in answering directly and immediately to comments on AOU
	Make chance of interaction between users	Create opportunities for users to engage with the organization, and for your users to engage with each other, and to encourage user generated content. Stimulate content reated by users.	Asking users to comment on social media material, or make storytelling about patients experiences
	Information collection	To ask users to give feedback, information, opinion with different tools.	A Facebook “group” could also be created to acquire information from a segment of the population that has experience with a particular topic. For example, a question could be posted on an organization's Facebook wall requesting a response.
	Making chance to make people participate to offline health related events.	Integrating the virtual and real world, and gives committed social media users the opportunity to gain access to events and opportunities.	Promoting offline health related events on the Facebook page
Sharing Market intelligence	Sharing news about health promotion information	To share experiences and information to develop an understanding and awareness about health information.	Post and link related to information about health and information post related to events for information dissemination about health.
	Sharing information on ongoing services and programs.	To share experiences and information to develop an understanding of the service provision context	Post related to new programs, or results implemented or to be implemented by the organisation
Mutual capability development		To actively contribute to the development of customers' skills, thus ensuring that users can effectively contribute resources in the co-creation of value.	To share post or to create groups discussing how to manage IT tools and how to contribute with Ideas and opinion interacting with the organisation. (for example “how to use the interactive website and leave opinion”, how to use web services etc)
To share decision making process		Decision-making responsibility is shared with customers and their networks in a value co-creation context and it is not considered solely the domain of the organization.	To involve users in discussion (groups or simple comments) about programs and treatment make then to give ideas and opinion beyond their personal interest and experience.

In the final phase of the analysis, through NVivo software, it has been investigated which users value co-creation activities can be influenced, affected and enhanced by different managerial support activities listed before. The different effect on the various user activities have been evaluated through the content of comments to the different messages posted by the AOU, the number reactions (in terms of sharing, likes, emoticons and number of comments).

4. Results and discussions

Looking at the contents, posted by AOU, comments and reaction by different users, it has been found out that messages were principally aimed to stimulate the active involvement of patients and users and they are very likely to be active giving reaction on post aimed to stimulate dialog. It has been possible to observe that the post of the Aou, analysed related to the different user cocreative behaviour are quite balanced, with a light predominance for dialog and the organisation service promotion (sharing market intelligence) linked to a huge presence of co-learning and co-advocacy related comments from the user perspective, also in terms of reactions. More specifically, it has been observed that the reactions of users related to information dissemination for health promotion and sharing service information is massive in consideration to the contents of comments and quantity of post sharing by users and patient. The involved users value cocreation activities with regards to Sharing Market intelligence behaviours of the AOU is considerable. As it shown in Tab. 4, in relation to this type of post, Cerebral activities, Colearning, Information searching and Collaction, Connection and Coadvocacy have been stimulated. Concerning Coproduction activities, it has been observed that it is possible to implement it as a cocreation activity in a social media platform, but it could be mostly encouraged by dialogs behaviours like involving partners and creating opportunity to interact between users. Users often provided suggestions for improvements and some ideas to develop in order to modernize the service and make it more patient centred: *“make sure that our doctors can take care of their patients and not the paperwork. Come and spend some time at the oncological hospital (from spectators) and try to understand, I wish you not to have to do it as a patient. It is palpable the difficult situation in which all the operators have fallen after the famous merger”*.

Moreover, with regards to the organisation service information sharing, a very interesting thing on the Facebook page happened. From one hand, a highly impact on coadvocacy reactions are present, to cite an example could be *“I have always felt good and I would recommend to everyone to give birth to them the best structure in the area”*, and from the other hand the level of interactivity triggered was qualitative significant. To give an example, a patient comment about the post of the app for tickets and services was to show the difficulties for elderly people with technologies, and AOU immediate answer was *“Dear Cenza, offering an extra service does not mean taking something off to someone else. Today, technology offers us many possibilities. I'll give you an example: our company allows patients who do the analysis from us to download the report on your smartphone or PC, Obviously to do so you need to have one of these two objects. Those who do not have them can still withdraw their report to the hospital, as has always been done. The same applies to the row at the ticket or for many other services ... have a nice day!”*

It has also emerged from the analysis, a relevant consideration related to the dialog, especially referring to information collection: the attempts of the health structure to ask directly for information and opinion were not so numerous; they introduced some posts for the possibilities for patient to give opinion also from the website tool. Unexpectedly, to give an example an user comment was, apparently criticizing the tool: *“It seems to me the classic paper questionnaire that is also found in shopping malls where everyone sees you if you take it, fill it and put it in the classic box. If you exceeded that fear of being in front of everyone, you would have earned the first place in the box. This certainly surpasses the fact of having to "put your*

face" but with the personal data does not change much. If your intent was to have data on the type of person who uses the service you could have inserted in the form some spaces such as: nationality, gender, age, qualification, etc. I would definitely remove the first and last name and leave the email as the only address". However, the AOU immediately replied: "Actually, the aim is to give people the opportunity to tell their opinion, give suggestions, express their evaluation or criticism (always constructive) in real time and having immediate feedback. Anyway thank you very much for your valuable suggestions!". This interaction can show that user are more willing to give information or telling their experience in an indirectly way rather than to be asked directly to do it. This results is very consistent with the studies of Kerlinger (1973); since that time in marketing research, projective techniques are more effective than traditional surveys. Indeed, the number of reactions in terms of likes, share and comments was small compared to those observable for the other type of post. Concerning the dialog and to stimulate interaction it is useful to underline that every single post of the AOU was accompanied by multimedia contents, like photo, video, and audio related to daily events on the AOU or health related contents to stimulate the attention of the users. Furthermore, it has possible to notice the relevance of post related to involving influencer and key partners. Particularly referring to the dissemination of information about chronic disease, with the contribution of important professionals, as it shown in tab. 4, it has been noticed that the reaction of patients is very significant considering the number of sharing and comments. Furthermore, another important aspect is linked to the direct interaction between patients (asking information directly) and the AOU (immediately answering) for example, about a post of the surgery services: "The surgery is done every Tuesday from 10:30 to 13:30. Third floor building Q. Allowing for real-time and two-way communication, social media can facilitate organisational communication practice by sharing information and building dialogic relationships. Indeed, Facebook platform allow health organisations to engage in conversations with its audiences through unique interactive features, such as sharing videos and photos, commenting on sharing post. Interactivity refers to the condition of communication in which simultaneous and continuous exchanges occur, and these exchanges carry a social, binding force. Interactivity enables social networking sites to facilitate consumers' understanding of health information, increases word of mouth among interpersonal networks, and improves consumers' self-management behaviours. Looking at our database, it emerged the attempt of the health structure to stimulate the interaction and the value cocreation activities of users and patients, but it is worth mentioning that the behaviour of sharing decision making process within the platform has been not possible to be observed regarding this case study. This is probably due to the characteristics of the health service and to the public contents of the social page.

Furthermore, it has been observed that several posts of the institutional Facebook page of AOU were structured to stimulate the emotional dimension interacting with patient. We founded that there is a particular emphasis on emotional concepts like *love*, *passion*, *pride*, which trigger a process of value co-creation confirmed by the correspondent reactions of audiences also expressed by using the "like" and "heart" bottoms of Facebook.

Tab. 4 in the following page shows examples of results about the analysis.

Tab. 4 Cocreative supportive behaviours and related User value cocreation activities.

Cocreative support behaviours	Subdimension	Example Quote (AOU post or comments)	User Value Cocreation Activities	Example quote (User comments and reactions)
Dialog	Involving influencer and key partners	<i>#Meningite, the advice of professor xxx and doctor xxx of the Policlinico Duilio Casula in the service of YouTG.net. "No alarmism: the contagion takes place only directly". #AouCa</i>	Cerebral Activities Colearning Connection Coproductio	<i>801 Sharing, 144 likes Needless to say that the best prevention remains the vaccine since we can not live inside a glass jar, too bad that this has a cost of 80 euros per dose for two doses per person (...). Perhaps it would be appropriate to treat all children equally and to allow everyone to protect themselves and get vaccinated (...) the risk is concrete for everyone and must be managed.</i>
	Responding to questions or comments channels.	<i>"The San Giovanni di Dio (an AOU hospital) is represented by various services and departments, such as ophthalmology, dermatology, orthodontic clinic, radiology service and sampling center, in addition to the palliative care and pain therapy center and, of course, the Day Surgery. We have published photos and videos of all. But if they have escaped, there is no problem: we will publish others". "Dear Patrizia, you must refer to the surgeons or the doctor who sent you in surgery. In any case, talk to your doctor who knows the case well and knows how to act The treating doctor always knows what to do because he knows his patients and knows the case well"</i>	Cerebral activities Information searching and collation Colearning	<i>10 hearts and 2 likes "I tried to contact Prof. XXX for my endometriosis that I have excruciating pains and blood and tell him that the (drugs) is not working, but no one answers, even with the email nothing, what should I do? Answer me, please, how can I do it? " "Thank you"</i>
	Make chance of interaction between users	<i>A news for all future mothers: here is the schedule for preparatory conferences for childbirth-analgesia! Read here to learn more. #AouCa # labuonasanità Parto analgesia, the calendar of preparatory conferences for the first half of 2018: here is the program"</i>	Cerebral Activities Coproductio Colearning Connection	<i>47 likes 22 share 4 comments Hi I would like to know when the water birth conference is done ... thanks Have you seen? Xxx, xxx?"</i>

		<i>Finally the sun is shining Happy Saturday to everyone from #PoliclinicoDuilioCasula in particular to our patients and to those who at this time is working to ensure assistance and care #AouCa # labuonasanità</i>		<i>"Lately I'm reading negative reviews about the structure and this makes me very angry I always cheer x the block q but unfortunately not all the.pensano like me"</i> <i>"It is bad to identify a department with alphabetic letters to better identify departments and managers. At the Policlinico there are no indicative signs and many employees are not very kind in welcoming"</i>
	Information collection	<i>Your opinion is important to us! Click on the link if you want to communicate with us to give us advice and suggestions.¢ You will help us improve! #AouCa # labuonasanità</i>	Cerebral Activities	<i>Non mi sembra il caso di chiedere dei suggerimenti/ opinioni, obbligando chi risponde a rilasciare nome cognome</i>
	Making chance to make people participate to offline health related events or activities.	<i>Salute della donna, dal 16 al 18 aprile open week al Policlinico. #AouCa#labuonasanità #salutedelladonna #openweek</i>	Cerebral Activities Colearning Coproductio Connection Coadvocacy	<i>287 sharings, 220 likes</i> <i>"Why as is showed in the site it appears at the Policlinico only an informative meeting and not even visits as indicated in the title of the post you shared"</i> <i>"But on the phone you put someone who knows how to take reservations and who is kind and helpful, not sour and arrogant like the one that is currently, who is not doing anybody favors because everything is paid for by us. Thank you</i> <i>Can we participate XXX?</i>
Sharing Market intelligence	Sharing news about health promotion information	<i>Early blood test and aspirin, doing so you save future mothers from #gestosi. Clinic of Obstetrics and Gynecology of the University of Cagliari of Professor xxxxx at the forefront: experimented at the Policlinico international study, almost canceled the disease. # # AouCa labuonasanità</i>	Cerebral activities Colearning Connection	<i>"Thank you"</i>
	Sharing information on ongoing services and programs	<i>"Fight against the pharynx and larynx: it is called Enhanced Contact Endoscopy and is the innovative technique developed by professor xxxxx, director of the Otorino Clinic of the</i>	Cerebral Activities Information Searching And Collaction	<i>50 sharings 347 likes 20 hearts</i>

	<p><i>#Policlinicoduliocasula, and by his team. #AouCa #labuonasanità</i></p> <p><i>"With the app, AOU Cagliari, just a simple click to download the analysis reports, and soon it will be possible for all radiological reports on your smartphone or on your computer! We work to improve our services and save you precious time • #Aou of #Cagliari walking with you • #labuonasanità #AouCa</i></p>	<p>Colearning Coadvocacy Changing habits</p>	<p><i>"Yes, yes, in fact I wrote because I got to see how good he is and how he prepares his team, fantastic! "When they operated on me at the parotis. I 1/2 years ago .. I go into the room ... all very kind ... the anesthetist (...) asks me what music I wanted to listen to (...) how to make a patient feel good "</i></p> <p><i>"Well done this service is very practical and fast thanks."</i></p> <p><i>"Sorry but for the withdrawal of the medical record you can go personally? (...) distance of months still nothing "</i></p> <p><i>"... in real time to the family doctor. The network increases its nodes and works better. "</i></p> <p><i>"... excellent, so you avoid moving people and data and reports can be dat"</i></p> <p><i>And to do the pt of the policlinico?</i></p> <p><i>(...) I had no doubts since I have to deal with the structure every 21 days since more di due anni e so bene come operate! Comunque grazie ancora</i></p>
Mutual capability development	<p><i>"You can download your laboratory exam report, which you do at the Policlinico or at San Giovanni di Dio, directly on your smartphone, pc or tablet. You can do it from our app or from the site by following the link you find here. #AouCa labuonasanità # # Innovation alserviziodelcittadino</i></p>	<p>Cerebral activities Changing Habits Coadvocacy Connection</p>	<p><i>116 sharings, 208 likes "Thank You, I will try to do it" "Look xxx"</i></p>

Another important consideration that emerged from the analysis is related to colearning activities. It has been perceived how important could be a social media platform to improve colearning process. Several comments of users were based on sharing information (acknowledge by other users and the AOU) and giving feedback about the experience on the service to give an example: *“I value you because you are doing an excellent job bringing healthcare into a human dimension”*. It could be relevant to trigger coadvocacy activities and for a virtuous process of value cocreation. This activity is one the more stimulated through the supportive behavior of the AOU. In addition, significant moment of patient cerebral activities (particularly referring to positive attitude and trust) occurs when the AOU shares daily hospital life pictures, such as maternity ward, aimed at hitting patients’ emotions: *“A new life to celebrate! What a nice way to start the day! Happy Sunday to all mothers and all the dads”*, which provoke consistent reactions of audiences. In any case, it as been observed that cerebral activities are really often stimulated by every type of action on the page on the AOU. For every supportive cocreation behavior there is an impact (in terms of different reaction) on positive attitude, trust, tolerance, expectations, commitment. This is in line with previous studies (Tomasetti et 2015) that consider cerebral activities as transversal to the other activities to almost the entire process, showing their effects particularly at the connections and co-production levels.

5. Managerial Implications and Conclusions

The paper has presented preliminary results of a case study about the use of social media platform to facilitate the patients value co-creation activities. The results of the research are interesting both on the theoretical level and on the managerial implications.

From a theoretical point of view, the framework enriches the literature on the topic of value cocreation in the health field as it offers a model to understand how healthcare organizations can support the patients value cocreation activities through the use of social media platforms. Furthermore, the model is one of the first that provides both, from the healthcare organization and the patients perspectives.

The findings of the content analysis suggest some important managerial implications. Empirical observations have revealed a number of complex issues that decision makers need to able to adequately manage. The study suggests that patients co-create value through different type of activities and integrate resources in different ways through interactions with public sources (support groups, community groups, family, friends, doctors, etc.). More specifically, the results highlight that social media platform facilitates the dialogue, provides an emotional support and support co-learning activities. An active dialogue implies knowledge sharing, learning and communication among peers. Social media platform provides an opportunity for audiences to sharing ideas and experiences, allowing users to provide feedback on new service as well as possible improvements to existing offerings (Kumar et.al. 2010). In terms of co-creation strategies, public health practitioners should encourage patients to engage in a range of value co-creation activities such as collecting information, co-learning, connecting, combining complementary activities, cerebral activities (e.g. positive thinking and emotional labor) and advocacy. In order to support these activities, some scholars (Heldman et. Al, 2013; Sharma & Conduit, 2016) suggest that public health practitioners have to identify the health information need of patients and align the message to the needs of audiences. The ability to listen and respond with relevant messaging demonstrates that public health organizations are paying attention and developing dialog capabilities. It is also important to develop a data management tools in order to capture and manage the ongoing dialogue users have with the organization, so that conversations continue regardless of the point of contact. Organizations should

identify opportunities to connect directly with users, and to facilitate discussions between users. These could be events, which allow users to connect directly with an organization, share resources and information on a public health topic, and facilitate rapid diffusion of knowledge among members about new healthcare services and programs. Through forums, the health practitioners should encourage patients to share their lived experiences with staff and other users and collaborate on ideas or strategies to increase users' engagement and reaction to public health messages. By monitoring social media, public health organizations can also identify key partners and public health influencers driving online conversations on health and services topics of interest and develop mutually beneficial relationships with them. In this way, become important to coordinate meetings to share information with the multiple stakeholders involved in the management of the customer's health care. In addition, the results show that social media platform can play an important role on health behavior change. Provide information about health management to citizens so that they are better informed to take part in changing own life style and habits.

6. Limitations and future research.

Although this is an exploratory research, the study has some limitations. The first is represented by consideration in the analysis of only one of the social platforms used by the health company (Facebook) which has its own specific language and communication rules. Could be interesting to study the other platforms used by the health company in order to verify if the value co-creation process grants the same degree of effectiveness of Facebook. Another limitation is represented by the singularity of the context of analysis, while it would be useful to make comparisons with other health organizations both, in the same territorial context and in other contexts. The limits highlighted above could represent also areas for future research which can open up the basis of scientific knowledge and to make contributions in making the framework richer. This descriptive study provides a foundational basis for further investigations of social media strategy for patient engagement in value co-creation process in health care and other fields.

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