Digital Transformation, Global Communication and Value Generation

New Collaboration-based Models in the Health Sector

by Donatella Padua*

Abstract
This paper discusses, via the theoretical approach of Digital Sociology, how Digital Transformation has triggered new models of global collaboration and participation, also behind the strong drive of the SARS-CoV-2 pandemic, creating cross-countries areas of connection and cultural exchange and, relevantly, impacting the model of value generation.
The study applies the interdisciplinary Four Paradigm Model to the Health Care sector highlighting how this sector is engaged in a deep digital transformation where patient-to-patient and Health Care professional-to-patient collaborative models entail the need of cross-linguistic communication to express the full potential of a global and culturally diverse communication. However, several risks of inequalities have to be taken into account because of digit divide and linguistic divide issues.

Keywords
Digital Health Sociology, global communication, digital transformation, cultural diversity, inclusion, digital multilingualism.

1. Introductory Remarks

Digital Sociology is a subdiscipline of sociology, a field of science investigating the impact, development, and use of digital technologies and their incorporation into social worlds, social institutions, and concepts of selfhood and embodiment[1]. This recent discipline born in the digital age is still evolving[2]. Digital Health Sociology[3], or, Digital Sociology applied to the Health sector, aims to investigate under a sociological perspective the impact of digital health technologies on delivering Health Care (HC) in innovative ways, providing information to people, helping them to share their experiences of health and illness, training and educating HC professionals, helping people with chronic illnesses to engage in self-care and encouraging others to engage in activities to promote their health and well-being and avoid illness"[4]. In the Digital Health definition we find the evidence of the effects of Digital Transformation (DT) on societies, at global level: digital

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technologies empower people by letting them access information and take part to decision processes once not possible; it allows patient-to-patient exchanges, opening a new era of social relations and shifting the focus of trust from traditional institutions and doctors to 'people like me', according to the peer-to-peer model[5]; it transforms patients as mere passive individuals into active and aware persons, informed and willing to participate, via open and citizen science, to the creation of new services, to research and health science advancements at global level. The interdisciplinary approach of Digital Health Sociology allows a multidimensional approach to the study of such a complex phenomenon as the Digital Transformation, under a cultural perspective, that is, based on the study of values, norms, definitions, languages, symbols, signals and behavioural patterns generated on the web. The SARS CoV-2 pandemic has represented an acceleration of the challenges which has added further complexity and uncertainty to this picture. Nowadays, our planet and our global society are facing massive challenges: the health of our planet and the survival of all animal and vegetal species, the climate emergency, remote work, distance training and education have made it evident during the pandemic how we all are connected. The next generations of high-speed fibre, Wi-Fi, cellular networks, low-power wide area networks, near-field communication between devices, and low-earth orbit satellite constellations are making the world more connected. The convergence of these technologies give Internet users greater speed and reliability, as well as lower latency, but deployment will require billions in capital investment from providers and this is likely to be uneven across geographies[6]. This will have a deep impact on communication: on the one side, work exchanges will extend across the globe; on the other, the massive amount of open data generated by open science platforms based on these technologies will require people to interact in different languages. This phenomenon will call for the massive use of automatic translators to have people of different cultures and ethnicities interact and share data. The intrinsic value of cultural diversity lies in the fact that if there is sameness and uniformity, there can't be any exchange, and without exchange nothing new is produced. The comparison between cultures makes it possible to create conditions that favor the exaltation of subjectivity, the development of creativity[7]. At the same time, extending the boundaries of sharing content to a global dimension encourages social inclusion and equal opportunities of development[8]: these are values at the bases of Diversity Management, an organizational model born alongside the process of globalisation[9] and widely inspiring a new concept of Digital Transformation.

Also, the idea of HC has evolved behind the pandemic drive, moving from a concept of public policy strictly grounded in national boundaries to an idea of a connected ecosystem, where people collaborate in research and innovation. At the base of it, the simple acknowledgement of being all connected, due to the evidence of the uncontrollable virality of the pandemic drive makes any country as any individual or organisation in the position of gaining a positive result from other countries' advancements in science. New needs have emerged for a resil-

ient management able to face unpredictable surges in patient volumes, integration of in-person and virtual medicine intervention, key supplies reserves strategies, policies on critical HC; infrastructure, and contingency production facilities for critical medical equipment will all need to be addressed[10].

Digital Transformation is a great opportunity to increase the efficiency of the HC sector: more accessibility to medical services; personalized treatments; shorten waiting times (reservations, medical check-ups etc.) increasing the ability to diagnose and treat and improving the delivery of HC to citizens and patients; using computing platforms, connectivity, software, and sensors to pursue a wide range of goals: achieve and maintain a general level of well-being developing actual medical and diagnostic devices. Thanks to the new "Connected Care" system, the health services are increasingly connected and the communication distances between patients, doctors, and operators are increasingly reduced. This global scope of action calls for valuing diversity and inclusiveness, in other words, it exalts the Digital Transformation Social Mindset that we are going to illustrate in the next paragraph.

2. The Digital Transformation Social Mindset

In the current extensive organizational and management literature[11], digital transformation is explained as the introduction of digital technology into the areas of organisation, management, business. Indeed, social values, people, society and concepts as diversity, sustainability, multilingualism do not appear. If any transformation implies a creative effort, an innovative design, then, there is the human intellectual contribution, there is knowledge and information, but also a mindset that drives the connection of 'dots'. In other words, there are symbols, values, patterns, a cultural texture on which this connection of dots is made. There is something more that technology, then. This is a 'digital culture' at the basis of any organization, that we call the Digital Transformation Social Mindset (DTSM)[12]. The DTSM is "the social value of DT, aiming to generate sustainable innovation and a new social role of institutions. It is a transformational mindset providing new visions, values and abilities to dynamically analyse the context, to courageously challenge the status quo, generating innovation based on sociality by connecting people and technology to create a social value that is aware of the environment, of ethical values, of diversity and future generations"[13]. In a complex and constantly evolving digital environment, the Four Paradigm Model (FPM)[14] allows us to grasp DT in its multidimensionality and to know its genetic components, that is, principles and basic values. The FPM helps in exploiting the potentialities of the digital by any institution balancing technology with human, profit with planet, business with people. This means acquiring the mindset (DTSM) of being able to capture and drive opportunities to the advantage of the institution and its people and to society as well, by limiting distortions and negative impacts. Multilingualism is part of this model as it allows institutions to connect people in an inclusive way, respecting diversity and localization.

According to the FPM, the digital landscape may be explored by four key dimensions. These four dimensions synthesize phenomena of different nature: social, as social

movements, social networks and communities, peer-to-peer models; economic, such as value chains and business models; technological, as crowdsourcing platforms or cloud digital technologies; organizational, as organizational models. These phenomena aggregate around four paradigms: Bottom-up, Connecting the Dots, Horizontality, and Sharing[15] representing four different angles, each focusing on different sides of digital phenomena.

Below, the first paradigm is applied to some examples in the HC sector, to highlight how DT entails new models of collaboration, molding new patterns of value generation.

3. The Bottom-up Paradigm: the Revolution in Value Chains

Nowadays, social media empower customers to make the first move and generate comments, reviews, contents in any form such as videos, pictures, text throughout any social media and device, in any context as at home, on the go, and in formal and informal environments. Brands, institutions, organisations have to respond to manage this process. The focus of organizations, today, lies in designing digital marketing and communication strategies aiming to engage a customer, a user, a patient in a conversation. Moreover, if traditional media communication processes work one-to-many, social media and communities, today, allow a many-to-many conversation. If the customer, in the 'analogic age', was in a passive position, receiving 'top-down' information, today, s/he transforms into an uncontrolled 'bottom-up' content generator. Customers as patients are not anymore consumers with no rights to reply, but they are rather producers of information, services or products and consumers at the same time: the new 'pro-sumers'. This active approach can add value to an organization by incorporating individuals' cognitive and emotional resources. In the current digital age, society and people whose identity, personality, and social life have been deeply transformed, want and demand to participate, to be protagonists, to be active. They wish to interact with companies and collaborate in the creative process. They want to co-create, in other words. Co-creation shifts the place of creation and extraction of value into the interaction between business and consumer. Value is no longer created by transactions of goods and services but by a new model in which participation and experiences are at the centre of the value generation process. In this way, value generation is contextual to the process of creation or utilization of a product or service. The market becomes a forum for conversation and interactions among consumers, consumer communities, and companies. In the HC sector there are many examples of co-creation: The MaketoCare (www.maketocare.it) initiative is promoted by Sanofi Genzyme, Specialty Care division of Sanofi. Sanofi Genzyme is specifically providing solutions for rare diseases, multiple sclerosis, oncology and immunology. MaketoCare supports initiatives and projects arising from the cleverness and passion of the Maker community that collaborates to the design of new solutions. Nevertheless, the website performs only two languages, which means that many countries are excluded from this project and Sanofi can't exploit the full value out of the project. Likewise, Design HC Innovation (designHCinnovation), is a platform focusing its scientific interest on the study of bottom-up HC

innovation processes: it concentrates particularly on those which present a collaborative nature and whose development journey is independent and experimental rather than institutional. This interesting initiative promoting bottom-up projects states the need of an inclusive approach, but in terms of language, it doesn't appear to be multilingual, performing two language options only.

Cuure is another example of brand-customer deep interaction in the HC-wellness area, as the platform allows a full customisation of food supplement via a co-creation interaction. Cuure (cuure.com) has a dedicated window to the recognition of different countries and languages, performing five languages. Global health crowdfunding platforms are other examples of tight bottom-up collaboration to the creation of new initiatives. Two examples are GoFundme, a crowdfunding platform for medical expenses, emergencies, health campaigns or Johnson&-Johnson use of QuickFire Challenge crowdsourcing platform to help identify, empower and rehabilitate potential breakthrough HC ideas from innovators around the world. Other examples are online petition platforms as weareplanned-parenthoodaction.org/ run by Change.org, which are global platforms to make petitions and activate change, or Foldit, a crowdsourcing computer game to take part in research via an open science model of bottom-up interaction. In these last cases, the platforms are multilingual and each country has a language-specific website, which appears to be an effective global strategic approach to international communication.

4. The Connecting the Dots Paradigm

According to the FPM, the CtD paradigm refers to digital-analogic ecosystems characterized by nodes and connections[16]. According to the theories of complexity[17], of social networks[18], of social capital[19], value is not only within the nodes (human nodes, represented by people, or technological nodes, represented by devices or servers) or touchpoints across the patient's experience journey, but it is also within what flows across the connections and is exchanged. Any kind of resource may be exchanged: information, data, decisions, actions, but, relevantly, also emotions, feelings: a key component of customer journeys.

The interaction is at the base of the value generation. The exchange generates a value which is superior than the sum of the single dots, taken separately, as the School of Gestaldt[20] teaches us.

CtD is quite a complex paradigm, very useful to grasp the 'philosophy' of the digital landscape, though. From the Steve Jobs' Connecting the dots to the sociologist Vilfredo Pareto's 'Instinct of combinations', in the digital ecosystem, 'platformization' of products is a phenomenon reflecting the dematerialization trend transforming tangible products into networks of intangible services connecting one to the other. Many are the reasons behind the transformation of physical products and services into service ecosystems: the increasing pervasiveness of the IOT technology, connecting objects via sensors, the demand for rich, quality and diversified experiences, the change of perceptions and behaviours of consumers. It is no longer important only what is sold to the final consumer, but everything that revolves around the product or service itself and

the entire flow of connections that are created. Products tend to evolve and transform into integrated systems that pass through the different stages of experience: from commodity to goods, to services, to experience.

An example is Apple Health app[21], to help users (doctors, professionals, nurses) to be engaged in their patients' health with ways to visualize, securely store, and share their health data. The app can aggregate patients' health records from multiple institutions alongside their patient-generated data, as well as share their health data with a provider to facilitate richer conversations. In this way, the patient is at the center of the caring process. Patients are enabled to download their health records and share their health data with a provider, being enabled to more actively participate in their health, as well help drive overall adoption of the patient portal. With real-time translation support for eleven different languages, the Apple Watch's built-in voice assistant can tell the patient how to say almost anything instantly. This technology indicates how Apple adopts an inclusive multilanguage strategy, effectively reinforced via the instant translator. CTD emerges also with on-demand products and services. Clouds in HC are examples of integrated capabilities to improve the entire HC experience, supported by AI solutions. Enhancing patient engagement, by delivering secure personalized experiences that engage patients through every point of care; empowering health team collaboration by connect, engaging and managing HC team with tools that help them provide the best possible care; Improve health data insights by getting insights to improve patient care by connecting data and using predictive analytics to identify clinical trends, while protecting health data. Microsoft[22] which is a leading company, performs ten languages and different localisations, valuing the role of language for communication, but, obviously, for profit as well.

5. The Horizontality Paradigm: Direct and Seamless Communication

There are some phenomena in the digital realm that highlight how social, technological, and economic patterns are turning from a vertical into horizontal models. Obviously, horizontality is a 'fictitious' device which tries to stigmatize a very complex and multidimensional revolution occurring across human, technological, and economic realms.

The Horizontality paradigm emerges from four key phenomena, as synthetically described below: 1. The pervasiveness of digital technologies puts social networks at the centre of new social models with fast interaction and high-speed communication, shaping a new 'horizontal society'. Easy access and constant connection empowers peer-to-peer relationships. Network relations oppose to linearity and verticality. 2. The creation of horizontal value chains based on peer-to-peer sharing and on the production and control of information is not governable by traditional top down value chains. 3. The exponential increase of global competition and the disruption of new competitive models as digital platforms force organizations to evolve their vertical top-down structures, their vertical power, and control systems into horizontal, network, and hivenet organizational models. 4. Speed of viral contagiousness fuelled by connectivity, pervasively spreading on 'the surface' through all connected

ecosystems. These phenomena imply that knowledge develops more 'on the surface' than according to mainstream vertical traditional patterns, the latter based on depth rather than superficiality. Main reason for this is the high speed at which we receive massive amounts of information, that does not leave us time to absorb it and provide depth. The sociologist Zigmunt Bauman has well defined how, in this context, relationships tend to become fluid, fast, hybrid, in one word, liquid[23].

What is relevant to our reflection is the value generated by a core feature of the horizontal paradigm: transmediality and convergence[24]. Transmediality, favoured by the proliferation of media across the digital landscape, is a phenomenon which is not media-specific and therefore can be realized by a large number of different media. Each media adds an enrichment, an integration to the user experience. A transmedial case is the campaign 'The Weight of the Nation'[25] which brings together the Institute of Medicine (IOM), Centers for Disease Control and Prevention (CDC), National Institutes of Health (NIH) and HBO. Designed to confront America's obesity epidemic, the campaign combined a documentary film series, social media engagement, books, DVDs and public screening kits. The content has flown across different media, sharing personal stories, informing family members, sharing experiences between individuals experiencing similar health conditions. In this case, the value of sharing the content globally via a multi language platform would have been massive.

6. The Sharing Paradigm

The sharing paradigm may be positioned under the umbrella of the so-called sharing economy, in a frame of 'collaborative economy' or the so-called co-economy, an umbrella term referring to the practices of sharing, exchanging, or rental of goods and services to others through IT without the transfer of ownership. Being the notion of 'collaboration' at the core of the sharing economy, concepts as 'collaborative consumption', 'peer-to-peer economy' express a decrease in transaction costs, in information asymmetry, and a consequent improvement of efficiency. But how can the health sector capture such value? On the web, the 'users' are people sharing experiences and knowledge with other people. The proliferation of social media empowers the web in transmitting opinions from peer to peer, spurring the virality of the message via WOM (word of mouth) and creating an environment which is increasingly more difficult for institutions to control. Sharing between health institutions and patients, citizens, helps in personalizing the one-to-one relationship and in producing trust and loyalty. This interactive communication, user-generated content (UGC) mainly, is a precious source of information in understanding needs, tastes, and behaviours in a much deeper way than through traditional offline market research. World Blood Donor Day was established in 2005 by the World Health Organization and is celebrated worldwide. On Instagram, #worldblooddonorday shares images and videos of the global event. Some of them are in various languages: English, German, Turkish, Portuguese, and many other Indonesian and Asian languages: automatic translation embedded in Instagram helps. Tik-Tok, the well-known social media has run a Search

for Multiple Sclerosis, with the intent of diffusing what are the symptoms of a MS attack or to support in case of Parkinsons' emergencies[26]. Stepes is a drag-and-drop portal which analyzes the video files and generates a translation quote in real time. This professional Tik-Tok video translator operates over 100 languages. The #istayhome-for Challenge Hashtag born during Covid-19 time spread all over Europe and world and across all social media, encouraging taking a selfie with a sign. It soon enough became viral and reached every corner of Europe helping the community stop the spreading of the virus. Most diffused Social media adopt powerful translation tools as Stepes. Also Vlogs and Podcasts for professionals like HCTransformers Actionable insights for executives, are powerful tools for training. Vitals instead, is the largest online database for patient reviews for doctors and facilities. These are just a few examples of how sharing on the web may become a powerful social tool: however, the more language diversity is observed by social media translators, the more the social impact is huge. Professional services as Translated perform an excellently extended range of languages, 195 exactly, supporting any form of need in translation.

7. Conclusive Remarks: Risks of Digital and Linguistic Divide

We have seen examples of the application of the FPM to the HC sector and how DT is deeply affecting the realm of health. The pervasiveness of digital technologies keeps changing our behaviours and impacting our lives. Rating a doctor, starring and making a review of a HC service; signing in for an online HC petition; twitting an opinion, good or bad, about an health device; posting a like to a picture of a global social HC initiative; blogging or vlogging a disease experience and sharing it with other patients; flash-mobbing for a social movement supporting governmental health public assistance. What do all these events have in common? Certainly: action, protagonism, freedom of expression, but also, identity and emotions, experiences, memories. These social phenomena find their origin in the stakeholders' empowerment provided by digital technology.

This paper has highlighted how digital technologies entail global social actions that gain value by the participation of different cultural geographies and regions. Connectivity, the widespread access to digital devices and omni-channel user-journeys disrupt any barrier to communication, fulfilling the Marshall McLuhan prophecy of a 'Global Village'. Behind it, individuals and groups' bottom-up initiatives, the connection of dots between technological and human nodes, patient-to-patient 'horizontal' patterns, viral sharing of user generated contents are the driving concepts behind the Four Paradigms Model[27] that explains the Digital Revolution under a socio-cultural and sustainable, inclusive, value oriented perspective.

In this study we have shed light on different multilingualism strategies: options for multi language translation, language specific websites, real-time translators via built-in voice assistants, different languages localization (multi language options for one country), machine translation apps, videos with subtitling translators.

In this picture, multilingual automatic translation technologies acquire a remarkable value as they represent a key prerequisite to a seamless glob-

al communication. Indeed, even if websites, social media, e-commerce platforms, forums and communities quite widely embed automatic translators, often the limited selection of languages provided or an imprecise translation lead to communication bugs and misunderstandings. But there are several other linguistic barriers that we ought to mention, that are not evident to web users, as they lie in the deeper layers of the web: multilingual SEO[28] or language-based, algorithmic information disparities generate dangerous forms of digit divide in accessing information in search engines. It is the case of crisis-prevention resources for suicide available through the Google search engine. A recent study[29] reveals that Google searches in English from within the United States still have the highest likelihood of triggering the display of additional crisis-prevention information prominently shown in addition to the regular search results (i.e., Google's suicide-prevention result), while searches in Spanish from within the United States appear to be informationally disadvantaged. Or the exclusion of ethnical minorities speaking languages not covered by translators due to limited value for money, as in the case of Guaranì speaking ethnical group in Paraguay[30].

This is just an example of how multilingualism, being a powerful tool to respect and manage cultural diversity (diversity management), may become a socio-political complex issue at global level.

The lack of a multilinguistic strategy in communication may not represent the only barrier to the exploitation of the benefits of a global digitally supported communication. Particularly in the HC sector, the shared definition of Digit Divide determined by the lack of digital infrastructures or devices, leads to disparities in patients' portal adoption, telehealth care access, or ability to utilize patient-facing practice management software, like online appointment schedulers; low literacy and income levels, geographical restrictions, lack of motivation to use technology, lack of physical access to technology, and digital illiteracy contribute to the digital divide.

Notes

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