Digital Design and Data Visualization for Society Health and Wellbeing

Roberta Angari[1](✉) and Gabriele Pontillo[2]

[1] Department of Architecture and Industrial Design, University of Campania "Luigi Vanvitelli", Via San Lorenzo 31, 81031 Aversa, Italy
roberta.angari@unicampania.it

[2] Department of Design, Design Campus, University of Florence, Via Sandro Pertini 93, Calenzano, 50041 Florence, Italy
gabriele.pontillo@unifi.it

Abstract. The contribution deals with the theme of the design of wearable and active devices, capable of communicating with the end user, mediators of the health condition and perceived and effective well-being of individuals.

The state of the art on the subject highlights how the use of wearable devices in the field of e-health, capable of monitoring the biometric data of individuals, has grown. Nonetheless, these devices are used for limited periods of time, becoming – in fact – a sort of fad, or in any case a passing phenomenon. One therefore wonders whether it is possible to intervene on the design of this type of artefact, in such a way as to trigger a relational link between the object and the user, in order to increase the latter's awareness of his/her health condition, with an impact relevant, with respect to the widespread quality of life, especially in cases in which one is confronted with more fragile sections of the population, in the presence of some pathological conditions, and for which monitoring of this type is therefore relevant.

The approach used will make use of the analysis of the scientific literature and the state of the art of reference, useful for understanding the interest and relevance of the contribution, especially after a hybridization between knowledge and between different disciplinary areas of the design culture, namely that of digital design, communication design and data visualization, used to outline an innovative approach described in the contribution.

Keywords: Digital design · data visualization · health and wellbeing · Digital Custom Design · Innovative design approach

1 Introduction

The perception that individuals have not only of diseases but also of health in broader terms, can influence both negatively and positively one's well-being, as well as the immune system, stimulating also miraculous reactions [1].

By interweaving studies ranging from the fields of medicine to information technology, sociology, and design, it emerges how the role of users has evolved, not only as patients but also for society as a whole.

N. Martins and D. Brandão (Eds.): DIGICOM 2023, SSDI 35, pp. 615–628, 2024.
https://doi.org/10.1007/978-3-031-47281-7_51

Aspects such as self-awareness and communication with patients, trust in science and medicine, as well as in treatments and therapeutic plans, the access to medicines, the desire to feel good and/or to heal, are just a few of the themes with which design, and in particular medical and communication design, are facing, as they are capable of translating or converting the complexity of information and medical practice into something visible, concrete, and tangible. Design is capable of making enormous changes, often with solutions that, precisely thanks to disciplinary convergence, can achieve multiple objectives at the same time.

For example, the area of smart and wearable devices, is of particular interest in the health design sector, because it is based on an already existing phenomenon, linked to the diffusion of technologically advanced interactive devices, which - worn on one's body – register biometric data, such as body temperature or heart rate, also in real-time. Yet, technological performance alone is not enough to make these devices part of the object panorama of individuals, except for limited periods.

Still concerning the medicine, health, and well-being sector, we observe the diffusion of digital tools and platforms, which communicate and display data, often in fascinating formats, but difficult to understand for heterogeneous user groups. On the other hand, a further risk, intrinsic in the field of data visualization [2], and in the design of medical/scientific visualization, consists in excessively simplifying the information, leading to a flattening of the multidimensionality of the data, which therefore does not represent any source of knowledge for the end user.

On the other hand, the visual communication sector can reach fewer literate groups of users. As highlighted by the history of communication and information design, it is thanks to Otto Neurath and to his methods and approaches, that we can observe the firsts examples of dissemination and democratization of knowledge, also in the medical and scientific field [3]. Nevertheless, this kind of project often remain linked to traditional communicational mechanism [1], such as awareness campaigns or sector magazines, equipped with a more accessible cut to information, or dedicated to specific context, as we can observe in the hospital campaigns.

The aim of this contribution is therefore to investigate the sphere of design for the health and well-being of society, through this double key of interpretation, namely that of digital design and data visualization, through the intersection of which, it is believed it is possible to lead people towards greater individual awareness, an aspect that is of particular relevance, especially when dealing with fragile user groups, for whom monitoring their health condition is crucial in their daily lives.

2 Background

The spread of digital is an endemic condition of the contemporary world that has profoundly changed both daily and work actions, through tools and devices that are part of people's everyday life [4].

This also applies to the field of health and well-being, in which digital has become a tool and a strategic means for improving the widespread quality of life: one of the most relevant reasons of this aspect, is that digital can abbreviate distances between medicine and society, also by recording biometric data in real-time thanks to portable or mobile equipment.

In fact, in recent years, there has been growing attention to issues related to the quality of life, health, and well-being in society, so much to require tangible and intangible artifacts that can bring medicine closer to people, to improve the health condition of the community [5].

Themes such as misinformation on medical/scientific issues, inaccessibility of services and poor management of treatment plans and access to medicines, awareness of the growing fragility of the population to the spread of viruses and infections, as well as the aging of the population, are just some of the issues that the health sector is confronted with [6], and with which, therefore, also design, in its various facets, is called to face, because it is not possible to think that design is something separate from health [7]. This is even more true if we compare ourselves with the definition of Quality of Life, by which we mean the convergence between different domains such as psychological and physical health, independence, relationships, and social conditions, up to the sphere of spirituality, religion, and personal beliefs [8], themes that emerge also from the study on the concept of Health, reported by the Horizon EU Framework Program [9].

It is evident how the quarrel is with a plurality of emerging issues which, having have a focus on health, and require a response on the design level, which can determine not only an advance for the state of the art of reference but also have a greater impact on the population, optimistically determining an improvement in the widespread quality of life.

In this regard, we recall the definition of *e-health*, as outlined by Eysenbach, according to which the term does not refer solely to the domain of electronics, but to all those parameters such as efficiency, enhancing quality in healthcare, evidence-based intervention, user empowerment, education, etc., which represent the challenges in the field of medical design, health and well-being. This definition is of particular interest for the research, because it is related to the possibility of expanding the boundaries of health through digital tools, that allow users to acquire information and, as well, to obtain advice or indications thanks to communicative actions that can move from the more specific and technical areas of medicine to the more general ones [10].

Finally, the theme of equity is highlighted, because, in a society that become increasingly fragmented and heterogeneous - both from the point of view of asymmetrical knowledge and a socio-cultural and ethnic point of view -, making health care equitable is an absolute duty. Therefore, also designers cannot fail to address this theme to guarantee a democratic and open diffusion of medical/scientific knowledge and services, regardless of the economic or cognitive capacity of the individual, or of the specific skills, which may affect its use. To do this, especially in the design of health and well-being for society, it is of fundamental importance to design by guaranteeing accessibility and social inclusion, as well as for different skills and competencies, in order to reduce as much as possible, the gap that still exists between different populations, economic contexts, age groups, gender, etc.

3 Tools and Technologies at the Service of Design for Health and Wellbeing

The recovery of an ethical dimension, also in the *digital-driven* project, and in particular for the health and well-being sector, is believed to be an opportunity to investigate more carefully the aspects related to economic development, inclusion, and innovation in the social, individual, and collective sectors. This is because the ubiquitous diffusion of digital, allows us to rethink the entire design and production chain, finally reaching the conformation of objects augmented by digital.

Since the 2000s, we have witnessed what is defined as the digital turning point, i.e. diffusion of integrated and interactive, flexible and dynamic tools, born from the combination of information technology, telecommunications technologies, media, and electronics [11], which have led to an acceleration of communication processes and a greater movement of data and information, in a process that has indiscriminately affected both the nature of objects, hardware and software, as well as the role of users, from passive consumers to active subjects. Part of this scenario are Advanced Manufacturing (AM), 3D printing (3DP), and the Internet of Things (IoT), i.e. all those processes based on open source and online communities, which are not only a testing ground in which the new generations of designers and innovators express themselves, but above all they represent the evolutionary force through which design is reinterpreting the relationships that people establish with objects and intangible assets, effectively recoding the DNA of contemporary objects [12].

In this panorama, experiences generated and managed through digital emerge, interpreting digital as a tool that accompanies the project without dominating it in the creation of new solutions in line with the advancement and evolution of society, which seek to identify contact points between advanced technologies and the world of experience.

For this reason, it is possible to state that the drive towards dematerialization is counterbalanced by tangible artifacts, which mediate the relationship between people and digital information and functions. This is the reason why digital manufacturing, through 3D printing, as well as robotics, artificial intelligence, and digital co-design platforms, raise the expressive and executive possibilities of design [12], and, at the same time, establish a dialogue with the company, analyzing not only the daily needs, but also promptly intervening in the appropriate changes or customizations.

These are some of the reasons why new technologies also find application in the health and well-being sectors, from whose analysis of scientific literature and the state of the art of reference, experiences emerge that use advanced technologies and tools for the creation of prototypes and/or customized products.

Advanced Manufacturing, for example, has contributed to considerably speeding up the conception, creation, and finally production process of an object, thanks to 3D printing, through which it is possible to create even very complex geometries, which can be customized according to requests and body measurements of each individual. To do this it is necessary to understand that the process is not based solely on the rapid prototyping of the single artifact, but we are talking about a process that starts from the definition of the geometry, through the digital survey of the user's body, through – for example – 3D scanning or photogrammetry [4, 13] from which it is possible to obtain models that perfectly follow the shapes of the individual's body, adapting to it. In this

regard, it should be noted that digital modeling, especially in cases where the design approach is that of generative and/or parametric design, allows for the creation - rather than the single form - of a process consisting of calculations and mathematical functions placed in relation each other, shifting the focus of the project from the realization of the form - form making - to the search for form - form finding – [14]. This type of approach is part of the digital supply chain [15] because, on the one hand, it allows the customization of the artifact through the modification of values or numerical parameters - custom design - and on the other, it is easily repeatable - open design.

In this perspective, the potential of these techniques and approaches in the field of health and well-being design is evident, as it is possible to produce customized devices, with very law costs and times compared to traditional methods, also making use of a technology which minimizes the materials used and - in any case - uses sustainable materials, overall improving the patient/user experience for the results obtained [16–18].

If on the one hand, digital design allows the conformation of devices that adapt to users, another theme to reflect on is that of the Internet of Things - IoT, which would further increase both the functional and expressive capabilities of objects, making them capable of transforming anyone in a data source - people, other objects, the surrounding world - by listening, monitoring and measuring the perpetual movement of their surroundings [19]. Undoubtedly the topic of active sensors is a relevant subject, with which all areas that have an interest - not purely economic - in the recording and monitoring of data, are called to deal, also if the implications related to the protection of privacy must be taken into account consideration. Nevertheless, the potential of these technologies is undoubted, because transform objects, and more particularly wearables [20], into something that *feels*, and which therefore interfaces and relates with the person who wears it.

By definition, wearables are devices that are worn and not carry [21]. They are therefore wearable, and always removable, tools that interface with the person wearing them thanks to the presence of biometric sensors and mechanical, visual, and sound interfaces, which allow bi-directional communication with the user, based on the receipt of recorded data of the body and the emission of feedback of various kinds - visual, sound, etc. [22]. The wearable devices currently on the market mainly belong to the sports and/or medical sector - note the vast diffusion of smartwatches -, nevertheless the potential applications of these objects are still to be investigated, especially as regards the communicative and relational interface between users and objects. It can be observed that the simultaneous technological advancement and miniaturization of electronic and sensory components have allowed the diffusion of objects, even of very small dimensions, such as smart-watches and smart-rings which instantly measure vital parameters, and the renewed attention to individual well-being and health, although they have led to a greater diffusion of these devices on the market, however do not guarantee their continuous use, for which there is still a growing abandonment rate after the first months of use of the device [23, 24], a fact that therefore highlights a real lack of need for the device on the part of users.

One wonders, therefore, whether wearable devices can be useful: as Norman states, it all depends on the use made of them, whether to increase our activities or as a source of distraction [20]. In this regard, it should be noted that the role of design is decisive,

not only from the conceptual point of view but also during the research and identification of needs phase, thus basing the project not only on the market trend but on the actual needs identified by the reference context, responding to specific requests throughout the project.

For this reason, it is believed that the field of visual communication and data visualization can be strategic in the outlined scenario, as through the use of communication methods and strategies, it would be possible to give shape and meaning to medical/scientific data and information, allowing as many people as possible to understand, metabolize and use these data, so that they translate into an improvement in the quality of their lives [25].

Therefore, it is up to the designer to conceive and develop artifacts for scientific communication, which can induce people to pursue healthy lifestyles and/or therapies, appropriate to their health conditions [26], communicating data and information technicians, through a non-academic, clear and complete language, useful for confirming authentic news and preventing false ones [27].

From this point of view, it is believed that the convergence between different design approaches and methods, typical of digital design, medical design, visual communication as well as data visualization, together with the new tools and technologies described in this section, can represent an important field of experimentation for the advancement of scientific literature and the state of the art on the subject, as well as in the search for new solutions designed for users, to create a new category of wearable devices, augmented by digital, which can facilitate the dissemination of medical/scientific communication that is based on individuals, and therefore is understood as a *bottom-up,* and not a *top-down* one.

4 State-of-the-Art Analysis

The continuous and exponential growth of devices equipped with sensors and electronic components that become part of the object panorama of individuals is well known. It is enough to carry out a quick survey of the most widespread online shopping platforms, and it is possible to notice a decidedly vast diffusion of smart devices useful both for environmental monitoring and for the individual. All these objects generate, day after day, a multitude of information, virtually connected to places, spaces, and actions of daily life.

This theme is of particular interest, especially for sociology, anthropology, etc. scholars, but how vertically do we enter the theme of health and well-being, what types of data are recorded, and how they are used by the devices that surround us? One wonders, is it really necessary to record all this information?

As previously stated, there are various smart devices, such as smart-watches and smart-rings, which today can be used for monitoring biometric data they are widely used mainly in the sports sector, even amateur sports, where users need to record and visualize their data, mainly for reasons related to performance monitoring [28].

Then there is a panorama of devices that integrate a material component - hardware - and an immaterial one - software - for tracking and monitoring one's health condition. This is the case of users who have pathologies and/or health conditions that require

more in-depth monitoring of certain data, which must be made accessible to increase user awareness, but also to notify or warn both cases of normality and cases where there are anomalies or any problems.

This is the case of Heylo[1], a device for people who live with a *stoma*, a surgically created opening in the abdomen to allow waste to escape, and for whom leaks have a significant impact on daily life, both physically and mentally. From the analysis of this need, the Heylo project was born, which offers users the possibility of tracking their ostomy on time and evaluating the integrity of their device through a special APP. Indeed, the sensor layer that is applied to the body is equipped with sensors that digitally record any leaks, and react instantly by providing feedback via the APP. Heylo is available in different sizes, this makes it comfortable for different body sizes and shapes (see Fig. 1).

Fig. 1. Hardware/software system of the device Heylo.

If the example shown above is based on a specific need, linked to an equally specific range of users, the Helios[2] and OHealth[3] devices, from the electronics company OPPO, are instead based on the need to ensure widespread access to information related to individual health. OHealth, the acronym of "Home Smart Health Monitors", is a smart device for monitoring health, useful to measure heart rate, blood oxygen level, ECG, and respiratory rate, as well as heart and lung sounds, anywhere and anytime. OHealth is provided by a dedicated mobile APP, in which it is possible to create one's electronic health record, as well as upload the data recorded in a medical database, to access remote assistance for routine diagnoses.

Helios, on the other hand, is a device through which users can measure heart rate, blood oxygen level, ECG, and respiratory rate, as well as heart and lung sounds, anywhere and at any time.

[1] https://www.red-dot.org/project/heylotm-58520. https://ifdesign.com/en/winner-ranking/project/heylo/348443.

[2] https://www.red-dot.org/project/helios-health-device-58508.

[3] https://communityin.oppo.com/thread/12223287813320212 49.

Unlike Heylo, to characterize the two OPPO devices, there is also a further aspect linked to the interface between users and device, because Informations are not communicated only by a mobile ALL, instead the device, itself, have in interface which display visual stimuli and report part of data (see Fig. 2).

Fig. 2. From the two images, is visible the interface of the two devices, Helios and OHealth, understanding how the communication component is relevant in the design of object that can record health data, in order to make them accessible to different kind of users.

This aspect is considered relevant for the reference sector, since, above all to facilitate the interaction between the device and the individual, it is of fundamental importance to be able to have different levels of communication available: an immediate level, i.e. linked to visual feedback, sound, etc., which is emitted directly from the wearable device, an information level, which for example can be linked to the interaction with an APP or a digital platform, through which to understand more information on the detection recorded by the device, and finally a level of in-depth analysis, linked to the interaction with doctors and/or experts in the sector, thanks to which any problems that emerged from the survey can be investigated in more depth.

Concerning the level of detail, communication between users and the doctors is a topic of particular relevance, especially in the preventive and/or management phases of certain pathological conditions. Examples of experiences conducted in this specific sector include the research conducted by Chou, Hsu, and Chou of the Research Center for Healthcare Industry Innovation, of the University of Taipei, where, in response to the theme of population aging - which is one of the topics of particular relevance for the health design sector, described in the first sections of this contribution – a kit has been developed, which allows the patient to monitor himself at home, making the recorded information always accessible to his doctor, thanks to a dedicated online platform [29]. Similarly, NuboMed Medical IoT Kit[4] collects patient data, such as body temperature, heart rate, and other important vital signs, in real-time, and then transmits them wirelessly to the hospital network, helping medical staff in clinical decisions. Designed to ensure high comfort, the devices, which are worn directly on the body, are made of silicone,

[4] https://en.nubomed.com. https://www.red-dot.org/project/nubomed-medical-iot-kit-58384.

ensuring optimal usability, as well as low energy consumption and environmentally friendly manufacturing.

Finally, we report the case of Anura[5], which unlike the examples previously reported does not make use of any physical device, other than the smartphone. Anura is an APP for smartphones, which allows the measurement of blood pressure without contact, i.e., without the need for bracelets or other wearable devices, as it is based on the measurement through a conventional video camera using the patented Transdermal Optical Imaging (TOI) technology. This APP, which also measures other physical, physiological, and psychological indicators, including heart rate, stress levels, body mass index, and cardiovascular disease risks with medical-grade accuracy (based on research and clinical studies), has, of fact, significantly modified the state of the art of reference thanks to the possibility of measuring and monitoring health and general well-being, through the sole use of one's smartphone (see Fig. 3).

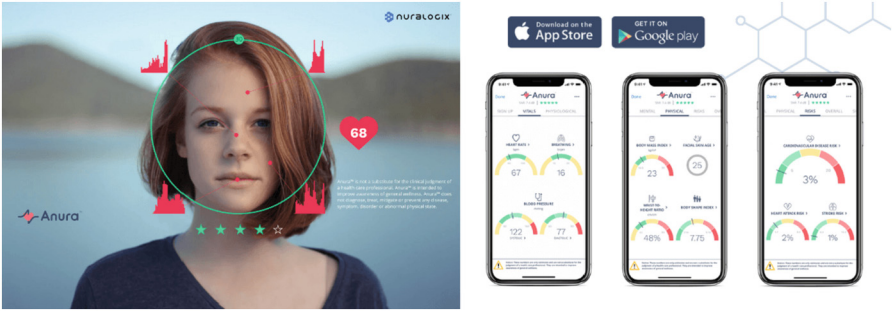

Fig. 3. The two images, show how the Anura APP works, with particular attention to the detection of the user's face, and the translation of data recorded into diagrammatic representation available in the smartphone APP.

5 A Design Approach for Health and Well-Being

Designing for the health and well-being of society, means dealing with a very complex project area. Although purely communicative system or design products can represent a possibility of advancement with respect to the reference state of the art, it is believed that the area of active and communicative wearable devices is strategic, because allow not only to record data and information but also to communicate with the end user, allowing greater self-awareness.

Nonetheless, wearing an object is a choice of the individual, which can alter the balance of the body, both from a physical and perceptive point of view, an aspect that can lead to the rejection of a wearable [22], for purely ergonomic reasons such as the device is heavy or obtrusive, or tied to the ground of the object. Otherwise, a wearable

[5] https://www.prnewswire.com/news-releases/award-winning-anura-convenient-and-contactless-health-tracking-comes-to-any-web-browser-anytime-301454313.html.

device to ne used day-by-day by the end-user, must be meaningful for a person's life, who will wear it also if it must be recharge – i.e.

To overcome the critical issues that determine the most probable crisis and abandonment factors, it is necessary to dig into the deepest and most concrete needs of the users, through which it is possible to create new design solutions which, if on the one hand constitute an advance for the state of the reference art, on the other hand, can lead to an improvement in the widespread quality of life.

By exploiting cross-fertilization from different fields of investigation [30–33], it was possible to define a hybrid and open approach to people's interactions with the design system, as well as with its outputs, real and virtual. This approach is called *Digital Custom Design*, the purpose of which is to define a design process augmented by digital, useful for the creation of customized and wearable devices. The approach consists of four phases, which are interoperable with each other and not necessarily sequential, namely:

Digital Human and Metaverse. Dematerialization of the human body, and transposition into a digital environment through scanning and digital relief techniques. This phase allows you to acquire the geometries from which to start for the definition of a wearable device model that adapts perfectly to the geometry of the user's body. A further potential relating to the digitization of the body consists in the possibility of generating avatars, through which to carry out virtual simulations on an ongoing basis.

Digital Design and Prototyping. Conformation of the digital model of wearable devices and realization through AM technologies. In this phase it is also possible to study the integration of electronic components and IoT sensors, making them an integral part of the designed device [34].

Wearable Devices and Smart Technology. In this phase, the operating scheme of a wearable device equipped with smart technologies has been defined, which - as previously reported - allows the detection and monitoring of data, and at the same time the communication of the single device with the user and with the surrounding ecosystem, for example with other devices – i.e. smartphone – or with digital platforms and environments for storing and displaying data, thus ensuring an interface between wearable and user, responding to the different levels previously reported, i.e. level of immediate communication, level of information and, lastly, level of detail.

Digital Communication and DataVis. It is the phase that deals with understanding how to convert the collected data into visual artifacts, making use of the visualization skill (Ricci, 2007), typical of visual communication designers and, more particularly, of data visualization and medical/medical visualization designers. Scientific, which starts from the analysis of the recorded data and the comparison with the cultural and scientific domain of reference, to then move on to the translation of the information into visual form, through dynamic maps, infographics, and interactive diagrams, which can be made accessible on various devices of the user, also, in this case, responding to the different levels of decoding and access to knowledge. Of particular relevance, in this context, is also the possibility of obtaining information and data which, if on the one hand, they come from a single individual, and therefore respond to a bottom-up logic, on the other hand, they can also be used to increase opportunities and the elements on which to

base the project of dissemination and dissemination artifacts. Although it is necessary to obscure some information, others can be used by aligning themselves with the strategies reported in the fields of Open Science and Citizen Science, which see in the active participation of society an important opportunity to make the latter more aware of the themes and advances of scientific medical research.

Furthermore, the outlined approach fits into a matrix scheme, characterized by the dichotomies: *3D Digital / 3D Physical; Products / Communications; Data monitoring / Data visualization; Wearable devices / Digital Devices.* The matrix relationship between the two axes is based on the intersection of specific skills and approaches, which will be applied in the development of innovative customized solutions (see Fig. 4).

Finally, although it is specified that the approach described in this section can also be scaled for other areas of the project, its connotation, centered on the user, makes it particularly useful for cases in which specific needs must be faced, and therefore, in the case of design for health and well-being, allowing in all the phases described to be based on the study and observation of both the single individual and a group of users

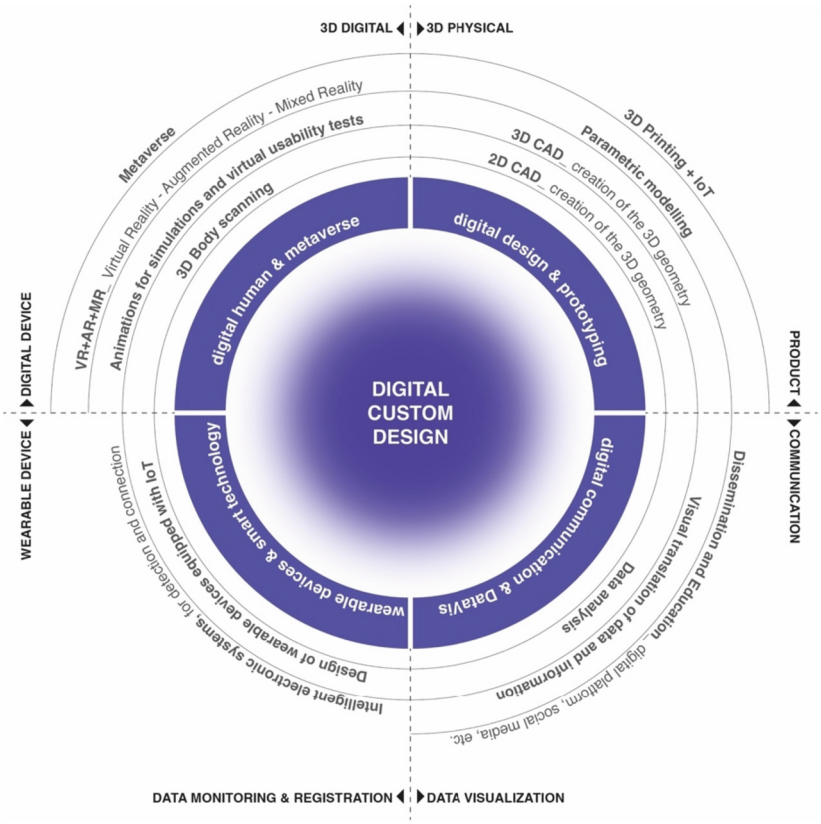

Fig. 4. From the diagram shown, it is possible to understand how the described approach is structured, including its matrix organization.

- think, for example, of the cases of users who fall within specific therapeutic and/or rehabilitation plans, or which must follow specific medical indications. This last aspect makes the approach responsive, at least from the point of view of the process, to the assumptions reported in the first sections of this contribution, i.e., that of being able to design wearable and communicative devices that can not only be an advance on state of the art, but also be a means to improve the widespread quality of life, even for the most fragile sections of the population, in the presence of certain pathological conditions.

6 Conclusions

When dealing with the issue of health and well-being for society, the project idea tends to move towards the field of device and product design, rather than towards the visual communication sector, completely neglecting the potential that can arise from the intersection of these two areas of the project.

Never as in this historical moment, the assessment of individual health is a relevant issue for individuals, who feel the need to have greater self-awareness. Yet, we remain tied to the design of wearable devices, such as smart-watches, etc., which suffer from the rejection of a wearable, except in cases where we are talking about users who have to use the device mainly for reasons related to monitoring sports performance, or for medical monitoring, in the case of patients suffering from certain pathologies.

On the other hand, it is believed that increasing the use of health monitoring devices could be a strategic choice at various levels because if on the one hand, it offers the individual user the possibility of having greater awareness, on the other it also allows preventive monitoring for any health problems. At the same time, data recording is also a potential for the public utility communication sector, both in terms of dissemination and dissemination, as it allows, obviously in compliance with the legal limits of reference, to have access to a vast set of data from which to start both for medical/scientific research and for drafting reports that are of fundamental importance for society as a whole, as they represent the mirror of what is happening.

In this sector, it is necessary to start from the definition of a design approach, to identify tools and technologies that can be used in the creation of active wearable devices, capable of communicating with the end user, establishing a relationship with the latter that does not stop for reasons related - for example - to recharge the battery, but the user must be encouraged to use the device.

To do this, it is necessary to make use of digital technologies, such as AM, and 3DP, as well as virtual simulations, which allow the creation of customized devices, which can be equipped with smart technologies from which to start the recording of data which are then converted into information and therefore knowledge, through the best-known approaches of data visualization and information design.

In this perspective, it is highlighted how data visualization can have an impact on individuals' attitude, motivation, perception and decision-making. Interventions related to the use of data visualization have been shown to have a positive impact on cognitive change, behavior and decision-making, also leading to greater engagement and improvement in the perception of information, increasing the amount of information provided and understood by users, decreasing the cognitive and intellectual burden to interpret

information for decision making [35]. It is for this reason that it is believed that research in this area must be carried out, taking care to hybridize skills and knowledge, in order to develop solutions that can benefit the health of society. Although this research activity is taking its first steps, it is believed that the subsequent topics to be treated will be linked to possible recruitments and needs study, so as to understand which data to monitor and how to make them visible, and at the same time which types of devices can satisfy the needs of users.

As a conclusion, some aspects are considered to characterize the contribution described and the research activity carried out, in particular as regards the theme of project ethics, which cannot avoid both reflections on environmental sustainability and those related to the possibility of democratically accessing both devices and knowledge, thus centering the entire design activity on people and society, guaranteeing social inclusion and innovation, especially in the health and well-being sector.

Acknowledgements. Although the approach and contents of the essay are shared by the authors, it should be noted that Roberta Angari is responsible for the *Introduction*, the sixth paragraph, and the *Conclusions*, while Gabriele Pontillo is responsible for the second paragraph. Both the authors wrote the third and fifth paragraph.

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