Definition of Organic Processes via Digital Monitoring Systems

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Abstract. Digital monitoring systems in medical practice is one of the instruments for determination of organic processes. Various kinds of organic processes such as childbirth, growing, development, eating, ageing, dying can be witnessed by digital monitoring systems. It aims to establish knowledge about working bodies and minimize spreading of illness or negative processes. Systems are witnessing about human actions, about functioning of invisible organs and very little changes in human organisms. Witnessing has links with measuring and judgemental codes in computer programs. Sensors convert mode of body to numeric parameters, measure statement of organism and compare it with necessary levels. As a result, digital monitoring systems mark changes and transgression of norms in individual organic processes.

In contemporary reaching of certain numeric parameters becomes in medicine a strategy of organic processes' improvement. Devices' witnessing connected with measuring and judgemental codes is an instrument for it. Doctors or patients look at results of bodies functioning and make their own decisions based on them. Specificity of witnessing of organic processes by digital monitoring systems is in its digital nature. Digital code is a basement for witnessing and measuring. It is created to save normal body's functioning. So digital code presents new reality (order), which helps understand the statement of organism. In this paper, we clear the question how digital code correlates with principles of body's functioning. What are the positive and negative aspects of digital determining? How digital monitoring systems can advance functioning of organism and what they need to pay back?

Keywords: Digital code · E-health · Fetal monitoring · Adherence monitoring · Organism's functioning · Body's creativity

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1 Actuality

Contemporary sociocultural and technical transformations engender the necessity of the reflection addressed to organic processes. Now digital and net worlds spread of a virtual image of organic. Digital reality makes influence on organic processes – advises what a man/woman should do. Computer technologies observe human bodies, offer their version of the best flow of organic processes, compare computer model and human organisms and so do what a man/woman cannot do. We have new reality, when electronic machines are instruments of determination of organic processes. Biomedia is a reflection of these processes. According to philosopher and biologist Thaker's point of view it "emphasis on the ways in which an intersection between genetic and computer "codes" can facilitate a qualitatively different notion of the biological body—one that is technically enhanced, and yet still fully "biological" [1].

Establishing systems of interpretation and action is inartificial for media including one of the DMS. For purposes of this paper, it is necessary to distinguish conflicts of interests between positions and settings. There are two positions: individual and superindividual. In addition, there are settings: routine medical practice, cosmic medicine, sports one, disaster one, battlefield one, and so on. Individual position is fluent and depends on personal will, for instance, to win a competition, to participate in war, or to avoid such activities according to his/her medical status. Superindividual position depends on group's frames in which it functions, such as interests of runaway group or national ones, and on national priorities, such as to be a strong country in sport, in military force, or in the Eurovision.

Situations in settings also differ. Only very rich in instruments and resources everyday medicine theoretically will try to keep life and health of everyone in the same manner. In all other cases there are some accents to do so on more valuable for the setting groups, such as public persons, officers, children, women and so on. To discuss our theme we are forced to keep this in our minds to accept existence of anchor points in the DMS encoding.

Digital monitoring systems (DMS) in medical practice are one of the instruments for determination of organic processes. Individually a man/woman uses devices to comfort his/her life. Devices use data about working bodies to minimize spreading of illness or negative processes (fatness, low musculoskeletal status). Reaching of this goal means establishing of human power under organic processes. A man/woman thinks such devices to be instruments for improvement of organic processes, because they can help to decide what to do in medical practice. We want to know how digital code correlates with principles of body's functioning. What are the positive and negative aspects of digital determining? How the DMS can advance functioning of organism?

2 Methods

We can define several methods for researching ability of determination by the DMS. For understanding of different projections of bodies in medical practice, we appeal to the A. Mol's conception of body multiplicities. This conception provides the idea about

limitation of bodies by focusing of investigating interest. Either it explains irreducibility different focuses of bodies to each other. We address to the theory of digital media for explanation of digital code in monitoring systems. For critical researching ability to witness and determine of bodies by digital monitoring systems we appeal to the ability of organic processes to correlate with each other.

3 Material

Devices have witnessing function. For purposes of this article witnessing means receiving information from concrete place due to essence in there, transferring this data to other places and describing, what has happened. Witnessing for a long time was only a man/woman's prerogative. There are many projections of human witnessing in judgment, in religion etc. Since invention of photograph in the XIX century machines systematically, become up–to–date improved witnesses. They can complete their functions continuously and emotionless in all settings both dangerous (war, catastrophes) and even unreachable for a human (micro world, Space). Their emotionless and unbiased but totally controlled ability of judgment is their benefits.

Ability of witnessing is applied by autonomous program in the processes of machine evolution. At the beginning of their existence, systems were analogue and only human interpreted incoming data. Up–to–date digital devices are opposite of it. They are intelligible and have ability to define a statement of organism according to special autonomous program. According to this program, monitoring systems measure statement of organism comparing it with numeric data and show the result. There are many different statements of organism for monitoring. For instance, smartphone-based biomedical tools include imaging flow cytometers, immunochromatographic diagnostic test readers, bacteria/pathogen sensors, blood analyzers for complete blood count, and allergen detectors [2], contact lens sensors for the diagnosis of glaucoma by measuring intraocular pressure [3], detector of vascular reactivity [4] and so on. Digital data collected by one device now can easily circulate among other ones to make a precise decision, for instance, circulation of visual and other data among dental services.

Witnessing of organism statement by the DMS have positive affect for medical management. John J. Mastrototaro says, that wearables, sensors, and mobile apps aim to "transition routine care from more costly environments (hospital, specialists) to less burdensome environments (local pharmacy, home), allowing the specialists to focus on patients with genuine need, while using alternative approaches for the management of patients with noncritical issues" [2]. So borders between out– and inpatients is now changing to establish, may be, remote ones, who will have their DMS-based diagnosticians at home.

This aim correlates with strategies of modern medicine to reach certain judgment parameters by more precise and widespread monitoring and adherence of patients. Witnessing and measuring of ones determines status of human organism – health, illness, death. Doctors or patients can look at results of organisms' functioning and make their own decision based on them.

Necessary parameters are reachable by different ways – organism can sustain itself or doctors can improve it by medical intervention. We are planning that monitoring

devices will take a part in direct correction of organic processes. They will be joined with other devices to put medicaments into organism, to control patients' adherence. Up today this function is not wide spread. However, despite of it the DMS determine potential of organic processes and lead to more medical interventions.

For interpreting how organic processes are determined by the DMS, we should appeal to digital code as special autonomous program. Digital code is basement for witnessing it creates new reality. The code establishes the order to protect optimal organism's functioning. This means that digital code reflects the statement of organism and connection of bodies. According to this digital code establishes numeric system for the statement of organism and fixes changes in this system referring to changes in organism. If one of the organs is bad, system can fix it via special program linking organs and their places in judgment system.

Digital code either has not only its own program, but also creative ability. It creates the order and defines processes according to the code. Human statement in such a situation is measured by device's logic, but not by logic of organism. Physiological and psychological bondages not on organism's self-regulation, but on the DMS, have dependence-producing potential, which is vitally important for further ranging of medical adherence.

Organism has its own logic and can find new routes for realization its functions, create new abilities. In situation of infecting and further recuperation, he/she becomes immune. It means that he/she got protective functions by himself and creates new order. One organ can help another one when it loses functionality and become destroyed (losing of eye ability). It is compensatory function. In case of losing some functionality other functions become stronger (replacement of visual ability by tactile sensation, if some parts of brain are damaged other function alike).

Absence of organ and its functions leads for searching by organism alternative routes for its future existence. For instance, new veins grow on the arm in case of transplantation previous ones to heart. Strongly advanced atherosclerosis not always leads to hobble and renal dysfunction (illness may flow slowly and metabolism adopts to it) [5]. Organisms can create alternative routes and this ability is out of digital code and artificial improvement. These types of organism working are not random. For understanding what organic processes are, we appeal to philosopher, physician and biologist I. Kant's theory. Kant suggests our knowledge about organic processes including two aspects: we can say about them due to appealing to mechanical laws and due to teleology ability.

Teleology allows saying about organic processes in terms of means and goals. It fixes the difference between matter and nature. Teleology ability explains that the organism has creative ability. It means that it has reproductive and replacing abilities. Biologist and philosopher Kant wrote: "Hence one wheel in the watch does not produce the other, and, still less, does one watch produce other watches, by utilizing, or organizing, foreign material; hence it does not of itself replace parts of which it has been deprived, nor, if these are absent in the original construction, does it make good the deficiency by the addition of new parts; nor does it, so to speak, repair it own defects. But these are all things which we are justified in expecting from organized nature. – An organized being is, therefore, not a mere machine" [6].

Knowing about organic processes as means and goals and organisms' creative abilities is the basements for medicine. Kant suggested that doctors must believe that nature or human body has rationality and all of the organs are connected with each other. Therefore, if we cannot be sure that organic processes are goals and means, we should not to make a decision in a medicine [7].

What does it mean for contemporary? We should note that there were only romantic beginnings of machine reality and no digital and net worlds in Kant's times. It is in apposite with the methods of this article. We may suggest retrospection to Kant's conception being as a clue for innovations in medical sphere. It is necessary to understand what happen in medical practice when creative ability of organism as attributive characteristics of all organic processes is not in accordance with digital monitoring systems.

Up-to-date researcher A. Mol speaks about multiple body and appeals to medical practice. She points on the difference between representation of body in clinic and its representation in pathologists' laboratory [8]. According to her article, projections of body make new illness body. We agree with this conception. It is impossible to find only one adequate representation of statement of real organs. The DMS cannot witness and determine statement of the organism in all spheres.

The DMS also cannot regret transformation of organic processes and establishing of it in accordance to a new order. For instance, these systems can determine destroyed organ, but it cannot represent teleological transferring a function of destroyed organ to other organ(s). So statement of organism is witnessed as abnormal, because one organ is no able to fulfill its function, but really other organ(s) fulfill(s) this function or not.

The DMS can witness and determine infected organism, but they cannot show getting a protective functions (in this case witnessing of pathogens, high temperature and bad blood count cannot represent of organic processes – is it normal or abnormal, organism have illness with temperature and bad blood count and it needs help or it is fighting successfully with viruses). The DMS can determine statement of organism without its creative ability.

Result of witnessing of bad significances is medical intervention. Understanding of body's creativity must be instrument of correction of medical conclusions, based on device's witnessing. In addition, understanding of body's creativity should be used in adherence monitoring. Researchers explain the goal of this monitoring next way. Wai Yin Lam and Paula Fresco remark that "Non–adherence leads to poor health outcomes and increased healthcare costs. Improving medication adherence is, therefore, crucial and revealed on many studies, suggesting interventions can improve medication adherence" [9]. However, we should note, that adherence monitoring has no purpose to show how organs are integrally functioning, but aims only to improve some their systems. For this purpose, the DMS mark when a man/woman has taken inside his/her medicaments, effects of drugs and other activities. Before it the doctor observed the patient, defined the doze for him and the patient agreed to fulfill these recommendations in accordance with media helping. It is not right, if doctor has only plan to reach expected results, but he does not expect on organism's creative ability. Understanding of this body's ability should fill this gap.

Our critical researching of the DMS does not means that we contradict with it. We would like to pay attention that it is very important to explain what has happened and

note to another order made by an organism at present or in future. Doctors should not hurry up with medical interventions, if it is possible. Understanding of body's creativity can be provided not only by doctors, medicine staff, but also by devices.

The first step on this way is witnessing of self-regulative ability of organism in different conditions. It means that digital monitoring systems measure not only due to digital code, but also due to principles of organisms' functioning. There are some examples for it in modern medical practice. One of the good examples is self-powered systems of integrated sensors and technologies (ASSIST). Veena Misra supposes, "Beyond activity monitoring, ASSIST wearable platforms can provide real-time measurements of ozone and volatile organic compounds in the environment and critical corresponding health signals, such as wheezing, heart rate, electrocardiogram (ECG), and pulse oximetry. This functionality can address the needs of asthma management by providing users immediate assessment of respiration burden and environmental triggers, leading to rapid treatment and enabling effective correlation between health and the environment" [2]. Determination of organic processes is flexible, when the DMS represent influence of environment on organism.

This strategy is also applicable by other DMS. They are able to witness, measure and compare statements of organism during the day and night, influence of different drugs on organic processes. I agree that actual question is how to personalize the remote patient monitoring (RPM). Researches suppose that RPM should "include patient-reported health related quality of life (HRQOL), symptom severity, satisfaction with care, resource utilization, hospitalizations, readmissions, and survival. There is little data investigating the impact of RPM on these outcome measures. It may strengthen the interventions if they are developed directly in partnership with end-users – i.e. patients themselves" [10]. All of these strategies of witnessing help to examine body's creativity. It helps to make right chose in process of human healing.

Furthermore, there are too much situations, when we cannot hope to body's creativity. In critical conditions' monitoring, he/she has not enough time to begin new order without intervention. There are risks that organic processes will have finished before they can start self-healing and self-improvement algorithms. Notwithstanding, in this situation we can trust only actions aimed at monitoring and fixating the statement of organism continuously. Devices are special instrument for it. They at once (automatic definition) can help to decide what doctors or patients would do in medical practice. It is good because in this case we do not rely on body's creativity and can correct the statement of organism immediately. Using of the DMS is one of the instruments to produce some analogue algorithm of such an ability by medical intervention. In addition, it detects what organ is out of order.

We mean, that there are positive aspects of using the DMS in medical practice. For understanding achievements of witnessing by them, we appeal to fetal monitoring. In 1966 it was established and today there are many critical articles about this instrument in medical practice. Problematic for analogue systems is interpretation of results, digital ones are out of this problem. Digital electronic fetal monitoring can define statement of woman and child automatically.

We appeal to patent US 9,693,690 B2, named Digital Electronic Fetal Heart Rate and Uterine Contraction Monitoring System. System can provide not only significances, but also signals of dangerous situation, what need to do and it can point on

wrong doctor's actions and so on. Stewart Bruce Ater, the author of this patent, writes the following: "The system can provide automatic alarms and discrete methods to relay information to doctors and nurses and medical providers for the mother whenever average and median rest intervals and other parameters exceed user adjustable preset safety limits. The system can provide automatic alarms enabling medical providers to make treatment decisions and interrupt injurious conditions before brain injuries occur, such as discontinuing oxytocin infusion or deciding to perform a Cesarean section. The system can provide automatic pausing of an oxytocin infusion pump to a mother until medical providers respond to detected elevated risks" [11].

The DMS are new method for preventing pathology of the organ or organic process. These systems are the mechanism to optimize processes of childbirth, which is almost free from doctor's position. We hope that they will reflect dangerous statement immediately and so it can help to improve childbirth.

The DMS are used beyond the limits of body's creativity tended to avoid sequelae. Can the DMS define approaches of organic processes' improvement? What happens if we agree that the DMS are right, and we immediately try to improve the significances? Doctors have not enough time to wait for the organism's actions to improve him/herself in critical situations. They make a decision due to machine data and understand that mechanical intervention to the processes is predominantly right chose in these cases (using of oxytocin or Cesarean section). Doctors decide to use mechanical instruments for reaching of necessary results. These results mean, that waiting of organisms' creativity have finished. Using of mechanical instruments correlate with correction of organism to save life.

4 Perspectives

In contemporary human organisms often are not able to regulate themselves. Contemporary medicine provides strong opportunities both for artificial preservation of human life, such as lung ventilation, assisted circulation etc. Such animated being without response from his/her reason evokes among society euthanasia disputes in local legislations, because death just without this staff becomes fast, painless and 'humanistic'. Criminals and other problematic social groups also are under request for these disputes. It is fair to assume that medically supervised anabiosis can become a form of detention (like as in the action film "Demolition Man", 1993).

How we can replace body's creativity not negatively, but by the best way? Scientists would like to create devices, which can witness and improve body's statement inside of organism via drug delivery, which is applicable all settings excluding professional sport one. It means that devices improve organic processes according to methods of improvement intervention with digital code programming it.

How it can correlate with body's creativity? Will organism (or its digital version) be able to fulfill self-regulation in future? In case, if no, decision-making centers will receive a powerful instrument to control and to discipline population. It will mean new types of medical benefits (health, youth, and immortality) for loyalty for social ideals and detentions (just 'switching off' some medical options).

Also much easier will become 'switching' between settings: routine medical practice, cosmic medicine, sports one, disaster one, battlefield one, and so on. Such 'switches' in the DMS and drug delivery systems can be a reasonable instrument for surviving through critical situations, because they are much faster and obligatory for organism than some complicated mental processes, reasons and individual decisions.

5 Results

Organism has creative abilities, so it is important to combine devices and doctor's position. Doctor observes the organism for definition if medical intervention is necessary. The DMS represent influence of environment on organism, witnesses and compare different statements of organism during the day and night, influence of different drugs on organic processes. All of these strategies of witnessing help to examine body's creativity. It is actual besides critical conditions of man/woman. Combination of monitoring system and devices for improvement of organism also should include knowing about body's creativity. Optimal position is media improvement of one's functioning before returning self-regulative function to it.

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