



# We Must Be Careful Not to Produce Automatic Killing Machines

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## Introduction

The addressee of this letter, while seems to be the editor, is actually the societies that are either recently or in the future taking steps towards the use of electronic health by launching a variety of health informatics courses. As a general rule, the users of the tool trust it because they believe the manufacturers have made and produced it by considering various aspects and taking the necessary precautions [1]. Software is also a tool that solves the IT needs of users. Health software is directly and indirectly related to people's health, so it is very important to ensure the quality of their work and performance [2-4].

Health information systems, health websites, self-care mobile applications, expert systems, and medical decision support systems based on medical guidelines or machine learning are among the most important software in the field of health that if not designed well or if their evaluation and validation process are not done accurately, they will definitely act as an automatic killing machine [5,6]. What is clearly evident from the evolution of electronic health is that it is rapidly progressing in the direction of providing machine doctor services. This issue is a message and highlights the fact that health informatics specialists who now play the role of logistics in promoting the health, will quickly become the leaders and flag bearers of the health field. They play an important role as vital tool makers since the health and survival of the people are in their capable hands [7,8].

- a) Adherence and commitment to the principles and professional ethics issued as the code of ethics and the code of conduct is one of the most important measures to ensure their precision and skill in the manufacture and production of vital tools [9-11].
- b) Paying serious attention to the data collection process, which should be based on a calculated design to avoid

unnecessary and repetitive data collection, is one of the key points in the design of health information systems. Also, regarding the design of these systems, the data processing should be considered carefully and based on an accurate design so that what is obtained as meaningful information or messages is effectively used according to the type of users and leads to making beneficial decisions to improve people's health [12,13].

c) Paying attention to the validity and quality of information on health websites will be the most effective factor in the health performance of the websites. and will greatly reduce the concern related to the transmission of false information to people who seek to improve their health through health literacy [14,15].

d) Involving health care professionals in producing self-care software, considering the range of self-care that can be from at least one to one hundred percent, is a very important issue that increases confidence in this type of software, which is often mobile based. Up-to-date, reliable, valid and high quality educational information that can be provided in this type of software is as important as the information of health websites. Also, serious attention should be paid to algorithm finding and its correct design (which guarantees accurate calculations, timely warning, right and reliable exchange of data and information between the patient and the health care specialist). This factor is considered as a key and effective among the other factors for the successful performance of this type of software [16,17].

e) In the design of diagnostic or therapeutic decision support systems that are based on medical guidelines or protocols, what should be seriously considered so that these types of vital tools do not become automatic killing machines, is the process of extracting rules from guidelines and protocols. This should be done under the supervision of medical professionals.

The obtained algorithm should also be controlled by medical experts of the same field of specialization through compliance with the medical guideline during at least three stages. Also, when coding the algorithm, it is necessary to ensure its correct conversion into programming instructions through control and matching [18,19]. In the case of algorithms that are the result of modeling and are done in the field of machine learning, it is necessary observing the principles of data mining and the correct implementation of pre-processing operations as well as the adequacy of the database. Controlling the data required for prediction, diagnosis, and treatment based on a prioritized list of effective factors that rely on valid medical references is one of the most important actions. In regards to image processing, it is very important and effective to pay attention to the quality of the data. One of the most important points in the safety of such vital tools (that is based on the power of judgment obtained from the indicators confirming the model's performance) is that the error rate of the algorithms acquired from machine learning should not be higher than the estimated error rate for using medical guidelines (e.g. %6). Otherwise, it will not be trusted by health care professionals, especially the medical community [20,21].

f) Expert systems in the field of health need a reliable and up-to-date knowledge base in order to have a function equivalent to a medical expert, and the design of knowledge management systems and big data management must be seen in the form of a comprehensive design [22,23].

g) The evaluation process is one of the fundamental measures that makes health software, as vital tools, not only harmless but also improving health of the society. In the life cycle of information systems, which includes stages of design, implementation, operation and maintenance, and deterioration, the evaluation process is carried out in the design stage and the operation stage to guarantee the efficiency and effectiveness of the software.

h) Algorithm testing or evaluation from different aspects helps to determine the deviation of the software from the standards, and increases the confidence for using it. It also makes the vital tools (health software) healthy and safe for promoting health of people [13,24,25].

**Keywords:** Automatic killing machines, Vital tools, Health software, Health informatics

## Ethics Approval and Consent to Participate

Not applicable.

## Consent for Publication

As the author of this letter, I give my consent to its publication.

## Availability of Data and Material (ADM)

Not applicable.

## Competing Interests

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## Authors Contributions

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