

Do We Still Need Electronic Medical Record?

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IoT (Internet of Things) is the technology to expel human beings, the component which has “limited time, attention and accuracy” from input channel, and to make computer to know “everything there was to know about things using data they gathered without any help from us” as Ashton [1] coined. Once a computer system obtains enough data, the computer system is ready to arouse ubiquitous computing environment which “enhance computer use by making many computers available throughout the physical environment, but making them effectively invisible to the user” as Weiser [2] dreams.

I believe the cream of Weiser’s idea is to provide salient computing support to people. “Computer use” doesn’t mean to make people sit in front of computing terminals or to absorb people’s mind to mobile terminals, but to empower people with computing power in each daily activity. IoT can be the silver bullet to free clinical staffs, doctors, nurses, pharmacists, therapists and even clinical clerks, from days to struggle with computers not patients. Unfortunately, current advancement of HISs (Hospital Information Systems) seems leading clinical organizations to the other extreme. As a matter of fact, Takemura [3] reveals the introduction of HISs absorbs five hours per patient from the clinical staffs. Without freeing the clinical staffs from input task, the efficient healthcare services cannot be achieved.

The key factor to couple HIS with IoT is to embed medical devices into HIS [4]. And the key factor to make HIS provide salient support is to let the HIS capture contexts. Fortunately, the positions of clinical staffs and devices provide rich information to estimate context in clinical organizations [5, 6]. Once a nurse, a device, and a patient are next to each other at the bedside of the patient, highly probable coming task of the nurse is to treat the patient with the device. If the device is a glucose meter, the nurse (who) will measure glucose level (what) of the patient (whom) with the glucose meter (how) at the bedside of the patient (where)

at this moment (when). Thus, HIS can obtain the measured value with 4W1H information. Only missing item is “why”. But I’ve never seen any record to tell why a nurse performs each measurement task. It may be because the reason is too obvious. At least, the reason is not needed for the HIS to provide salient support. The HIS can easily navigate the nurse to collect blood sample from the arm without infusion line with the given 4W1H data, for example.

Current AI (Artificial Intelligence) boom hasten medical informaticians to data-mining researches, and, consequently, to claim the importance of “standardization” or “structurization” of EMRs (Electronic Medical Records) to let computers easily process the records. But, I think, we should stop our hands and deliberate how the records should be in the first place. IoT provides machine-origin data in machine-readable form. We don’t need clinical staffs as a recorder. The existence of human hands prohibits computers to obtain bias-free big data, and, consequently, to provide salient ubiquitous services. By making clinical staffs to input structured medical records to computers, medical informaticians hinder growth of medical AI technology as well as decrease efficiency of clinical staffs. In order not to make ourselves the enemy of our colleague clinical staffs, we need to change our mind set. We shall free clinical staffs from input task and make HISs to record everything. We should expel clinical staffs from recording process as Ashton claims.

For EMR, to be or not to be, that is the question.

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