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VIEWPOINT PAPER

# The six P's of the next step in electronic patient records in the Netherlands



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## KEYWORDS

Electronic patient records;  
Personal health records;  
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## Abstract

The objective of this study was to evaluate a decade of Electronic Patient Record development. During the study a second question was added: How to take the next step in the Netherlands? This paper describes the developments but the main results create a framework for the future situation. The USE IT method was used, which is derived from DOI and TAM theory but applies it in a qualitative way. The results show six P's that have to be covered to introduce a nation-wide EPR. The first three handle the end users of the EPR: Patients, Professionals and the Public. The latter three show the action types of a nation-wide EPR, namely: Purpose, Process and Prerequisites. In conclusion, the combination of these six P's show that the main purpose for a patient is the quality of health, that the process of the professional has to be smoothed and that the data quality has to be guaranteed as well as privacy.

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## Introduction

In April 2011, the Dutch senate voted down the proposed legislation on information exchange in healthcare, which aimed to provide a legal basis for the national health information infrastructure, also known by the misleading name of the national EPR. In addition, the senate adopted a

motion that in essence barred the Ministry of Health of any further involvement in the development of the national EPR. As of 2012 the national information infrastructure is owned and operated by an association of healthcare providers. Healthcare providers can connect to the core services on a voluntary basis, although a financial incentive to connect is provided by the health insurance companies. The adoption of the core services is gradually increasing well beyond critical mass, with new developments being planned for roll-out in 2015 (Table 1).

General practitioners (GP's) in the Netherlands use information systems first for administration and later for

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**Table 1** Connections to the health infrastructure (Source: VZVZ, August 2014, <https://www.vzvz.nl/page/Zorgconsument/Links/Over-de-VZVZ/Feiten-en-cijfers>)

Care providers	Connected to LSP
General practitioner	3356 (82%)
Pharmacy	1736 (88%)
GP's emergency post	118 (99%)
Hospitals	32 (35%)
Total	5242 (83%)
Patient information (unique patients as % population)	4.408.770 (27%)

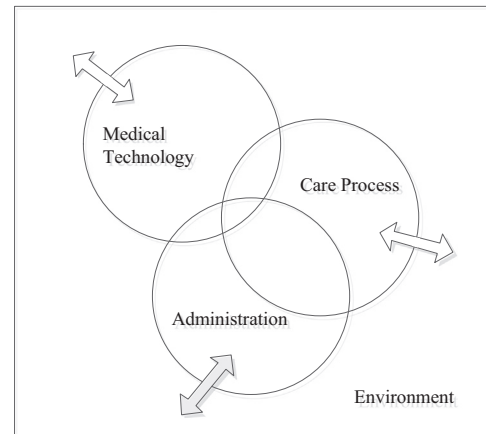
patient care for a decade or two. They were ahead of the hospitals and other healthcare organizations. In 2000 some 40% of the Dutch hospitals expressed the desire to use an Electronic Patient Record, without actually buying one, because the ideal EPR for the Dutch market was not available yet [5]. A decade later, a survey among 20 hospitals demonstrated the progress: approximately 90% used electronic medical records in one or more departments and 67% used or was implementing electronic nursing records [9]. So, the implementation of EPR's has really taken off in the Netherlands.

It is therefore interesting to investigate what stimulated these developments and to see whether these are sustainable. In 2002 we presented the EPR-orientation model about success of EPR's [12], which was updated in 2013 [11]. In this paper we further analyze and explore the developments in the Netherlands to gain a better inside about the use and the user of EPR's, and the sustainability of the progress.

### The updated EPR-orientation model

Many terms and acronyms are used to describe EPR's that is the reason why we will start with making clear what we mean by an EPR. The definition we use in this article is the definition of a Computer-based Patient Record (CPR), given by Gartner: "A system that contains electronically maintained information about an individual's health status and care. It focuses on tasks directly related to patient care, [...] The CPR completely replaces the paper medical chart and thus must meet all clinical, legal and administrative requirements" [4]. Our criterion for a successful implementation of an EPR is, whether the EPR is adopted by the intended end-users. We adopted the definition Rogers gives for adoption of an innovation: "the decision to make full use of an innovation as the best course of action available" ([15] p.21). In our research and our model we focus on the innovation product, i.e. the EPR, we do not look at the innovation process, i.e. the development of the software and implementation process.

The EPR-adoption model is based on the model of [22] about technology in healthcare. The model of Walley and Davies translated to the healthcare organization leads to three orientations from which an EPR can be developed: administration, medical technology and care process. The three orientations are not strictly separated but share processes and interfaces. (Figure 1). An EPR can originate



**Figure 1** The updated EPR-orientation model.

from the medical technology orientation, e.g. as an additional module of the Picture Archive Communication Systems (PACS), or from the administration orientation, e.g. as an additional module of the hospital information system (HIS), or from the care process orientation, e.g. the general practitioner information system (GPIS).

From our research we learned that the intersection between the administration and care process orientation is becoming larger. A relatively small intersection exists between the administration and medical technology orientation. Also the relation of each orientation with the environment is increasingly important [11]. These aspects of the model will be explained in more detail in the next sections.

### Large intersection administration and care process

The administrative requirements related to an EPR have increased dramatically over the years. From the very rudimentary level, of capturing the patient details and their diagnosis and capturing the relevant activities to a care-product based financing scheme, relating diagnosis and treatment to a specific tariff. The revenue of the healthcare institution is based on this tariff for every care-product they deliver and submit for reimbursement. Increasingly the quality and/or outcome of the treatment is taken into account as well. This means that from an administrative point of view the care-product that is being financed, needs to link with the care services that are being offered for patients. Such generic services are then personalized for the patient in a treatment or care plan, which guides the actual delivery of care, the documentation and registration of the activities carried out and outcomes achieved, and the reporting that is required by the government and/or the health insurance companies. The reporting of delivered care and the patient flow are increasingly subject to rules - including electronic formats - of government or insurance companies. That is why a connection with the environment is added to the administration orientation. Ideally, the registered data are used for evaluation also. This trend can be observed in all sectors of healthcare. These developments create many relations between healthcare processes and administrative processes. That is why the intersection between the administration orientation and the care process orientation is made larger and becomes an integrative nature. Because of the close relation between administration and the care process, most care organizations prefer to have an EPR as an extension

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