A Review on Efficient Architecture for Clinical Result Analysis

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Abstract— The clinical report is an essential part of the service provided to patients. It is of the utmost importance that the report be uniform, comprehensive, easily managed and "readable" to humans and machines alike. Effective communication of the results of radiological procedures is critical to high-quality health care. But Radiology reports today display significant variation in structure, content and terminology. Consequently, referring clinicians and radiologists find it much more difficult to find the information they need in reports. This paper describes the ways to overcome the above mentioned shortcomings by designing a template editor which enables the report author to more rapidly create a report by providing pre-authored text and fields that highlight important reporting elements and ensure safe and valid reporting behavior.

Index Terms— Clinical Report, Radiologist, Dictation, Templates, Template Editor (key words)

INTRODUCTION

This paper describes about the efficient way of managing the clinical results. Radiologists record patient data in medical reports after each examination or test. Editing medical reports in the reporting systems is a main part of radiologists’ daily work and associated with the workflow in hospital. How radiologists use the medical report systems has directly affection on their workload and work efficiency.

According to a recent study, Clinicians have expressed their dissatisfaction with radiology reports – 41% of 432 clinical specialists feel that the radiology report is not valuable and are too vague. 84.5% of the clinicians, 67.5% of the radiologists believe that when reporting complex examinations, it is better to work with separate headings for each organ system [1]. These statistics show the high need for developing an architecture which includes the designing a report template editor that manages the clinical data in a way that is easily understood by the referring physician.

The purpose of the report templates are that they are intended to improve the act of generating reports by making it faster (pre-authored text) and easier (less memory work, de novo composition) since the written radiological report is the most important means of communication between the radiologist and referring medical doctor. Report is part of the patient’s permanent health record, and interprets the investigation in the clinical context. The appropriate construction, clarity, and clinical focus of a radiological report are essential to high quality patient care [2]. Also Report Templates are intended to improve the resulting reports themselves by making them more complete, more consistent, and more readable for humans, more parse able for machines, more compliant with local or national guidelines and more correct/accurate.

KEY PROBLEMS AND SOLUTIONS

Radiologists are judged based on the radiological report which is developed as an end product [3]. Radiology reports are non-standardized with the conventional method of creating reports which is dictation method [2]. Because of this, reports prepared using the traditional methods have several problems which concern the content, the time taken to prepare the report and availability for research.

The report contents problems are because the reports are incomplete, vague and interpretation is very hard. This is because the radiologist has to remember what to include in the report, a few sections might be left out, which makes the report incomplete [2]. The referring clinician who is reading the report cannot decide whether the organs were examined or not if specific organs are not mentioned in the report. Since there is no standardized terminology, the reports are often hard to interpret. One large analysis of 8426 reports found up to 14 different terms used to describe a single common abnormality, and 23 synonyms for reporting the presence of the same pathology [3]. The traditional reporting process is also time consuming. As it contains several steps that take time, it is the cause of untimely reports [2].

American Healthcare Radiology Administrators (AHRA) found that report turnaround time is a constant source of referring physician dissatisfaction in a survey. Quantitative analysis is very difficult to be carried out using free-form texts and even though natural language proposes a lot of flexibility for expression, to summarize the natural-language data needs a human encoder [3].

Hence the key solutions to all these problems are using Structured Reporting. In Structured Reporting the information or the material is standardized and filled in a concise, clear and ordered format. It is more time-efficient than the traditional method of dictation. Structured reports allow radiology report information to be recorded so that it can be retrieved and reused more easily [6]. Structured reporting has several ways of improving the radiology reporting process over the transcription method of reporting.

Structured reporting provides a standardized method of presentation as a result contents of the report may be improved [4] [5]. This encourages the production of a detailed and complete report [4]. The standardized presentation also provides another advantage, as referring clinicians do not have to go through vast amounts of descriptions to get to the results. This improves quality and speed of communication between radiologists and referring physicians [4].
OUR PROPOSED APPROACH

In this paper we suggest that Structured Reporting must be followed for the radiological reports. Structured reports let the radiology report information to be noted so that it can be fetched and reused easily.

Radiology Templates aid for the creation of the Structured Reports. A template is a preset format in a document which can be used as a starting point for a particular application so that the format does not have to be created each time it is used. Hence a template editor can be developed for the creation of appropriate templates. This saves a lot of time since a preset structure is already present and clinician does not have to create all the sections and fields from the beginning.

Management of radiology report templates (MRRT) standard is followed in creation of the templates. MRRT defines radiology report templates using an HTML5 based format. Standardized templates created using MRRT standard would make reports clearer and easier to consume quickly which results in better speed and quality of care. MRRT creates a profile to manage and exchange report templates that will result in wider dissemination of best-practices, improve the quality of radiology communication, and will also reduce the risk of errors.

CONCLUSION

The traditional radiological reporting is found defective by most of the clinicians and the reason being nonstandard way of creation of report. In order to bring changes to the way of reporting continuous efforts need to be put to increase the reporting quality and efficiency. To improve the function of radiology in giving quality standard, template editor can be used which enhances the relationship of the radiologist and referring physician [7].

REFERENCES


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