In-House Developed Radiology Information System, Using Ruby on Rails and Health Care Standards

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The radiology information system developed consists of thirteen modules, which represent each of the individual processes of the institution.
Outcome

We developed and implemented a RIS with Ruby on Rails (3) and postgres database (4). The software includes functionalities for appointment request, appointment setting, patient admission and order generation as the first part of the process; a worklist with progress bar time alerting about defined due times as well as nursing, technologist and medical records (Figure 1). For the process of lecture report it allow HL7 (5) integration for voice recognition systems and imaging visualization integration with OSIRIX through XLM-RPC protocol. The process of billing was also included following local and international reglamentation; all the generated information can be monitored through BI and Dashboard modules. Finally, some extra functionalities are included to manage research projects and authorization. (Figure 2)

Many Processes were improved in the institution, one of them is the delivery time of results which decreased by 30%, because the system indicates radiologists the studies that have priority (outpatient, emergency and priority) or that are overdue for delivery.

Figure 2

Graphic interface of the developed RIS, Worklist, appointment and dashboard views

Discussion

Rapid growth of information inside a healthcare institution requires information systems to facilitate the process to obtain, store and analyze data in a quick and reliable way.

Despite the wide offer of commercial RIS software with multiple functionalities for information management in an institution; high costs and the infrastructure designed for bigger companies, make them not the best option for small centers with restricted budget; who need a more personalized and flexible solution.
With its own development, the institution has management and total control of its process, identifying weaknesses, improving its market strategy through competitive advantages, as well as establishing continuous improvement plans in patient’s care by incorporating emergent technologies timely.

Because the development was performed as a web platform in Ruby on Rails, it’s compatible with any operating system and mobile device with authorized access to the internal network. Additionally, this language will allow integrations through web services with DICOM Web visors and other systems that incorporate the standard DICOM Web (6) and HL7 FHIR. It’s expected that future developments disengage as gems which can be released to the open source community.

Conclusion

Having information from all process in an institution is a priority, but having it organized as a tool for decision making, strategy planning, and monitoring of objectives and goals is vital. If this tool is structured and designed for the own needs of the institution, then it would be a key element to improve efficiency and competitiveness inside the market.

The implementation of an in-house developed RIS, increment strength and confidence to face new challenges and dynamic changes in healthcare area, using high technology tools adapted to our own needs. One of the greats advantages of this project is the fact that it was in-house developed, so it would be much more agile and affordable integrating with new modules and functionalities.

References


Keywords

radiology information system, RIS, RUBY on RAILS, business intelligent, radiology workflow