

Leveraging Open-source Solutions to Facilitate Research through mRIC: Forming a Cost-effective mini Research Informatics Core

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Summary

New Jersey Medical School has consolidated personnel and technical resources to provide informatics and information technology support to basic science and clinical research. Our goal is to facilitate the research study by reducing the administrative cost using a wide variety of open-source and homegrown informatics techniques and applications.

Introduction

New Jersey Medical School is not part of the CTSA consortium yet, it has limited IT resources to support basic science, clinical and translational research. In order to satisfy the education, research and clinical missions of the school, by initiating mRIC (mini Research Informatics Core), our goal is to facilitate the research by reducing the administrative cost using a wide variety of open-source or homegrown informatics applications yet minimizing the investment from the school.

Building mRIC

Personnel

1. Supervisor: Assistant Dean for Research
2. Only 1 Technical Staff: Programmer Analyst II

Technical Stacks

- Linux, Apache, MySQL, PHP
- MS SQL Server, ASP.NET
- Oracle Server, Java, Grails, Tomcat, JBoss Application Server, PostgreSQL
- Hadoop, MongoDB, Node.js, RESTful, JSON
- Mobile Apps: Android, iOS

Foundation of mRIC

In 2010, the Office of Research hired an experienced full-stack developer (1 FTE) to serve in the area of research Information Technology development. Our developer is overseeing the development and operations of various frameworks and databases to facilitate basic sciences and clinical research.

Featured Projects

Among the projects which is in amount of 125 to support our research community, 46% of them are supporting basic science research, while clinical research studies or trials are occupying 28%.

1. OCRA Review: An automated system which streamlines the submission and administrative review at Office of Clinical Research Administration (OCRA) for clinical research study which uses University Hospital services.
2. Research Legal Review: A streamlined platform handling legal reviews on corporate contracts and government/non-profit clinical trials contracts.
3. MIRDCell v2.0 (<http://mirdcell.njms.rutgers.edu>) [1]: A homegrown software for use by the nuclear medicine research community for the purpose of evaluating cellular radiation absorbed doses and surviving fractions of cells in multicellular clusters. Currently the software is being widely used in 101 research institutions, cancer centers or medical centers.
4. Cancer Summer Research
5. Cancer Center Tumor Bank
6. Tissue Culture Facility e-Commerce
7. Implemented REDCap [2]: not open-source but free of cost research data collection and survey platform: currently 246 active users and 212 projects;
8. Clinical Informatics
 - OpenClinica [3]: commercial but open source clinical trial software for Electronic Data Capture (EDC) and Clinical Data Management (CDM).
 - Caisis [4]: an open source, web-based cancer data management system.
9. Research Collaboration:
 - Harvard Catalyst Profile [5]
 - VIVO [6]: by providing semantic web-compliant data to the network, scientists of the participating institutions will facilitate scholarly discovery.

Advancing mRIC

Explore, Learn and Share

Our developer has been invited to share his expertise and knowledge on research data capture and management at various seminars or symposiums. And our developer has been actively serving as

reviewer for several peer-reviewed journals e.g. Journal of Medical Internet Research, Journal of Educational Computing Research, JMIR Medical Informatics, interactive Journal of Medical Research, JMIR mHealth and uHealth. Recently our technical staff has also been invited to serve as reviewer to Medinfo2015, the 15th World Congress on Health and Biomedical Informatics and AMIA 2015 Annual Symposium hosted by American Medical Informatics Association. Our staff are encouraged to attend conferences or exhibitions in those research fields.

Through those academic, extramural scholarly activities, mRIC stays tuned with the current trend in information technology resources for medical school and its research in the field of basic and clinical sciences.

Conclusions

The mission of mRIC is exploring, investing suitable open-source solutions and developing in-house applications to facilitate basic sciences and clinical research yet maintaining minimum administrative investment. The service model at mRIC significantly improves the efficiency and reduces the administrative cost at New Jersey Medical School. The automated and streamlined web applications substantially save investigators and research study team's valuable time so as to launch their studies sooner and the basic science studies and clinical studies have been expedited and facilitated, therefore, our mission is being satisfied.

References

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- [2] Harris, P. A., Taylor, R., Thielke, R., Payne, J., Gonzalez, N., & Conde, J. G. (2009). Research electronic data capture (REDCap)—a metadata-driven methodology and workflow process for providing translational research informatics support. *Journal of biomedical informatics*, 42(2), 377-381.
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- [6] The VIVO Project. Available: <http://vivoweb.org>. Accessed 3 January 2015.

Appendix

Research database service model and support process

