

# High-Tech Doctors: Open Source for GPs

David H. Chan, MD, CCFP, MSc, FCFP

As presented at the Family Medicine Forum, Calgary, Alberta.

## ► *What is open source?*

Free/Open Source Software (FOSS) has been making news within the last few years. Here is a sample of some headlines from news web sources:

- The American Academy of Family Physicians is considering developing and selling low-cost “open-source” electronic medical records software<sup>1</sup>
- UK unveils Open Source policy, may make it “default” option<sup>2</sup>
- Taiwan to start national plan to push Free Software<sup>3</sup>
- The German feds join a list of governments turning to Linux<sup>4</sup>

## ► *Source code vs. machine code*

When a computer programmer writes a program, it is written in words and sentences that are interpretable by trained eyes. The source program will be interpreted or compiled into machine-readable code, which can be executed by a specific hardware and operation system

## Dr. Smith's case

Dr. Smith is currently using paper charts and is thinking about changing to a paperless office.

After attending many vendor shows he is still unsure if he wants to invest in any of them. In particular, Dr. Smith is concerned that he will be locked into any of these systems just like many clinics he knows. He anticipates many inevitable changes within the health-care system, which will create new demands on the way that he does things. Since Dr. Smith is convinced that any electronic health record system will not really save paper or time and it will involve spending more money, he really wants a system that will improve his ability to provide better patient care. Will the latest evidence-based resources be available at the point of care? Will he be able to improve the system if he has new ideas to try out? Will there be other people to support him if the vendor's support is not satisfactory?



platform (e.g., an Intel CPU based computer that is running the Windows operating system). An open source software is software that makes its source code available as part of the distribution of the programs. The intent is that the code can be peer-reviewed for correction and improvement. It leads to rapid evolution of high quality program code, which is less likely to contain errors (or bugs) and less vulnerable to virus attacks. In contrast, store bought close-source programs are hidden from inspection for correctness and may contain undesirable code.

### ▶ Open source software is free

Most open source software is free. They are usually available for download from the Internet. However, the emphasis on the new concept in software production and distribution is about freedom. You are free to modify, make copies and distribute them (known as copy-left). One type of open source license is the General Public License (GPL), which makes it explicit that whatever you put into the program must also be made available for others to use. You cannot change software with the GPL license to close-source software. Open source software business is based on good service and innovation. There are many successful open source software products; Linux and Apache for example. The most successful open source medical software is Vista, which is based on a computer language called MUMPS. MUMPS based electronic hospital record systems are used by many commercial companies, which supports most of the hospitals in Canada.



**Dr. Chan** is an Associate Professor, Department of Family Medicine, McMaster University, Hamilton, Ontario.

### ▶ Open source clinical applications and resources (OSCAR)

The information technology group at the Department of Family Medicine, McMaster University, developed OSCAR in 2001. The software is based on many other open source software components. It is currently supporting the two academic teaching units within the department and several other clinics around the Hamilton area. Because OSCAR is a web-based product, one can access their patient's records from any location that has a high-speed Internet access. Although several specialists use OSCAR, OSCAR was designed primarily with family doctors in mind. The patient's progress notes can be entered as free text or structured forms and templates. Documents can also be scanned in. Pictures, sound and web pages can all be part of the patient's chart. Prescriptions and access to laboratory reports can be made online. There are many decision support tools (i.e., antenatal care planner, diabetic management, reminder system, etc.). There is also a built-in secure messaging system that works like the e-mail program, except that this program can communicate, not only between staff within the clinic, but also with providers from other OSCAR sites and even patients. The scheduling and billing programs are important components to allow the clinics to run smoothly.

In my "paperless" office, my patient schedule and all the patients' complete records are accessible from the computer in each examination room. I enter all new information directly into the computer, but other doctors can use a digital dictation system to record the new information. I print out patient education materials and all order requisitions (laboratory and diagnostic imaging).

Prescriptions are currently printed and signed, but can soon be faxed directly. Referrals are made with patients in the room and the receptionists are automatically notified once the referrals are made. I use my digital camera to take pictures or record video clips, which are uploaded to the patient's chart. There are handy clinical calculators online, which enable discussions with patients about their cardiac risks or osteoporotic fracture risks.

### ▶ *OSCAR workshops*


Since OSCAR was released to the world on November 17, 2001, there have been many physicians interested to learn about the software. Several OSCAR workshops have been run (<http://oscarmcmaster.org>) in Hamilton, and in Vancouver, with the objective of showing others what the software can or can not do. Many physicians attend for one-on-one training to learn how to install and maintain the software in their clinics.

### ▶ *OSCAR collaborations*

OSCAR encourages users to collaborate at different levels. The software is now receiving contributions from programmers from Brazil, Toronto, Kitchener and Vancouver. The clinical resource database (<http://oscarresource.org>) is where users can store and share useful patient education materials and clinician learning resources. There are also online forums where users can share how to best use OSCAR. The best example of that is "Reports by Example" where users can teach each other how to generate useful reports from OSCAR using the standard structured query lan-

guage. Patients can also collaborate to put user friendly information in the oscarCitizens resource database.

### ▶ *The future of OSCAR*

The next open source software to be produced is oscarCitizens. Patients can securely communicate with their providers, make appointments and access portions of their health records. They can also write their own personal health records, which they can choose to release to whoever they wish. Based on their health profile, specific prevention and chronic disease management reminders will be delivered to them. 

### *Frequently Asked Questions*

#### **1. Where can I find out more about OSCAR?**

- Visit <http://oscarmcmaster.org>.

#### **2. What's the best way to try out OSCAR?**

- Try the demo at <http://oscarmcmaster.org>.

#### **3. Where can I learn more about open source software?**

- The best book on the subject is Eric Raymond's, *The Cathedral and the Bazaar*. The OSCAR clinical resource database (<http://oscarresource.org>) also has a section on open source news. It contains a list of references related to open source software.