How better and cheaper software could save millions of dollars while improving Canada's health care system

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Billions of Canadian tax dollars have been funneled to private companies [to develop proprietary medical software](). More tax dollars were then paid to the same companies to use the software to run our medical system.

This might not have seemed like a big deal at a time when Canadians could easily get a doctor and our [medical system](#) [had one of the best doctor-patient ratios in the world](#).

Fast forward to today, when [one-fifth of Canadians cannot find a doctor and more than half "battle" for appointments](#). You can now easily spend an [entire day waiting when you visit the emergency room](#). Wait time for surgeries and [diagnostic tests](#) such as MRIs are much longer now, and [over 17,000 Canadians died waiting](#) for [health care](#) in 2023.

The once-great Canadian health-care system is being [pushed to its limits](#), and as a result, is "[failing](#)." Add Canada's [recent population growth](#) into the equation, and you have an under-resourced system that is stretched too thin.

The health system might be better prepared for these challenges if literally billions of dollars had not been squandered on [proprietary software](#) development. A [new study](#) I wrote with my colleague Jack Peplinski at Western University shows how embracing open-source development saves millions and could help rescue Canada's broken health-care system.

Undoing waste

Although the Canadian federal government has invested [over $2.1 billion developing health information technology (HIT)](#), all 10 provinces still have their own separate HIT systems. Besides being an obvious source of redundancy and waste, these systems:

- do not work together,
- are expensive and
- are inconsistent.

After first reviewing how these systems operate, we analyzed the economic costs and savings of integrating some of the functions of the software. We chose something easy and straightforward that all the provinces needed and settled on the common billing, lab results and diagnostic imaging (BLD) functions of these separate systems.

Then we proposed using a free and open-source software system called HermesAPI to provide BLD for Canada. Our results provide a glimmer of hope for our struggling health-care system.

Proprietary software vs. open source

To understand how money is best spent on software development, you have to understand a little bit about licensing.

The HIT software that has been bleeding Canada dry is proprietary. No one other than the company that made it knows how it works, and each province pays these companies a license fee to use their software even if they originally paid to develop it. No one can share the software either (for example, Ontario cannot legally share the software it helped fund with Alberta or vice versa).

That means each province must fund companies that pay employees to maintain nearly identical software, 10 times over. Each doctor's office and each hospital has to pay for its own electronic health record license.

Worse yet, the Canada Health Act states that health care should be portable, but because these HIT systems are separate, it is not. The Auditor General of Ontario's 2009 report on electronic health records (EHRs) found more than a billion dollars of waste.

Another approach that immediately eliminates that waste is called free and open source software (FOSS). FOSS is available in source code

(open source) form, and can be used, studied, copied, modified and redistributed with restrictions that only ensure that further recipients have the same rights as those under which it was obtained.

That last bit is the core viral idea of open source development: if anyone makes an improvement in the software, they must share it back with the community. This is how FOSS evolves and the rapid churn in innovation in a wide array of areas is the result.

Not surprisingly, industry loves open source. Ninety percent of the Fortune Global 500 use open-source development. In fact, today, open source software is the dominant way to develop software in industry because it tends to be technically superior and more secure.

The evidence for this is that FOSS is in 100 percent of the world's supercomputers, 90 percent of cloud servers, 82 percent of smartphones and most artificial intelligence.

Every internet company you use, from Facebook to Amazon to Wikipedia, is built on a stack of open source software.

A better way to develop medical software

Currently, eight provincial governments representing over 95 percent of Canada's population allow private companies to create their own electronic medical records (EMR) system and integrate with provincial BLD systems.

Our study found the cost to develop and maintain HermesAPI would be about $610,000, but would prevent $120,000 per software development company per province in development costs, for a savings of $6.4 million. This approach would lower barriers to entry for the HIT industry to increase competition, improve the quality of HIT products

and ultimately patient care.

The real secret of open source software is that it encourages competition in capitalism. FOSS prevents vendor lock-in and monopolistic companies, both of which are common with our current proprietary software model. For example, 90 percent of EMRs in Canada are the products of just three United States-based companies.

Our study looked just at BLD, but there are many other such opportunities in our health-care system. The open-source approach is one option towards building a more interoperable, less expensive and more consistent HIT system for Canada.

Yes, this means we will be sending less money to prop-up American software companies, but the return on investment of open source is likely to be very high. Fifteen years ago, Ontario's Auditor General found that by implementing a unified medical records system, we could save at least $6 billion. It is far more than that now.

This time, we could do it right and instead of subsidizing proprietary U.S. companies, we can ensure every Canadian dollar invested in software is open source so we can save our loonies for doctors, nurses and hospital beds to keep up with our burgeoning population.

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