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Building a More Efficient Marketplace: Lessons from DC Health Link's Experience with Open Source Code

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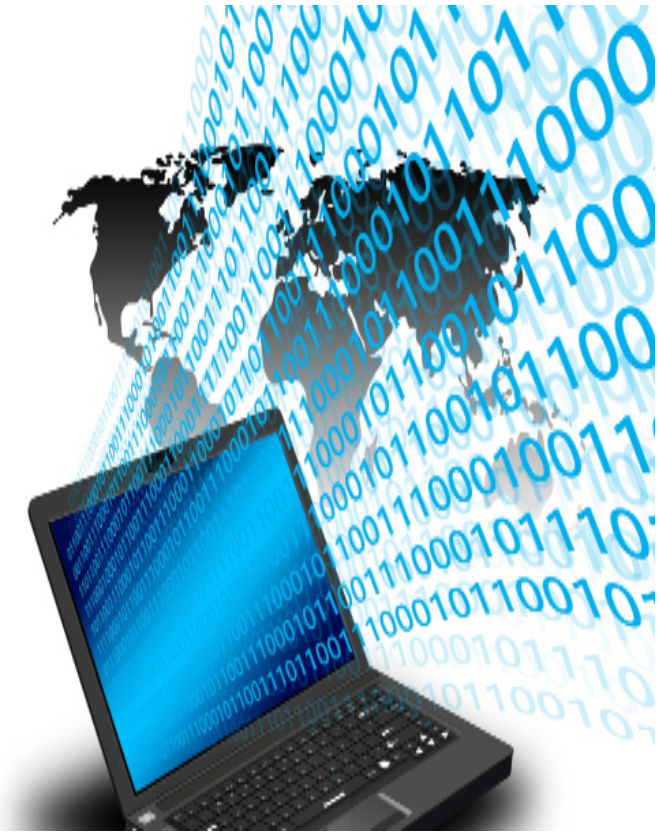


Every open enrollment affords State-based Marketplaces (SBMs) new opportunities to introduce innovative ways to continually improve their systems while also lowering costs to achieve sustainability of their marketplaces. During the 2015-2016 open enrollment season DC Health Link, the District of Columbia's health insurance marketplace, began using open source code, an Agile development approach, a commercially hosted government cloud, and a re-architected solution.

This change comes on the heels of several years of costly issues. Launched in 2013 with two commercial off-the-shelf (COTS) products DC Health Link faced millions of dollars in annual licensing fees for COTS products. Change requests ranged from hundreds of thousands to millions of dollars due to the complexity of changing hard-coded software. Product development cycles were long, averaging six to eight months for updates. Deployment of changes required the marketplace to be taken off-line for maintenance, which meant customers could not use the marketplace while the system was down.

Following the major overhaul to its health insurance marketplace, DC Health Link reports significant benefits from these changes including: documented savings, a reduction in consumer complaints, and greater agility to address and improve technical functions.

DC's success with open source code presents an interesting opportunity for states exploring their marketplace models and technology. Using the experience of DC Health Link, this brief explores the use of open source technology to improve customer experience, reduce technical failures and find cost savings.

What is Open Source Code?

"Open source" refers to publicly accessible code or technology that can be shared or modified by any developer, giving users the ability to choose and customize at will without incurring extra costs.[1] Source code, or the underlying code that runs a program or application, is made publicly available to networks of developers that can then review or modify the code.[2] Using open source code is a way organizations can reduce costs while taking advantage of a vast network of technical innovation.

The open source community is a thriving network of tens of thousands of developers who collaborate on data fixes and the creation of new software.[3] Unlike a website like Wikipedia ®, where changes can be made by anyone and are immediately displayed, open source patches are subject to a system of review.[4] Usually, open source networks are highly watched and reviewed communities, regarded by technology professionals as extremely reliable and secure. In fact, some open source software is more secure than closed source code.[5] Developers submit patches or updates to the source code, usually to address security issues or other glitches. After review and testing, the patch can either be accepted or the original builders of the program can work on developing their own patch. This network is not all volunteer-based; there are for-profit companies that sell support and training services for open source technology.

Flexibility is a large part of the appeal of open source code. Unlike commercial products, open source coding is a constantly evolving technology that often produces solutions more quickly than private companies. There is also a wealth of existing code that can be pieced together to form a unique program. To use the Linux example (**see box on right**) different applications and functions can build off the "kernel" to suit individual requirements.[9]

Popular Uses of Open Source Code

The most well-known and popular example of open source sharing is Linux, an operating system originally developed in 1991 by Linus Torvalds.[6] The infinite customizability and low associated costs of the Linux "kernel" has caused it to be taken up by businesses the world over; Google, IBM, and Amazon all use Linux code in major IT functions. Linux is the operating software for 98 percent of supercomputers, and powers most of the worlds Internet servers.[7]

Thousands of developers use and have access to the Linux code everyday. Patches and changes are subject to a higher rate of review then most private companies are capable of. The code itself can be acquired and modified by anyone. anywhere, for free.[8]

Why Open Source for Health Insurance Marketplaces?

Use of open source code can benefit insurance marketplaces because it can be freely acquired and adapted to suit the needs of each state. Unlike commercial products, open source enables a marketplace to have greater ability to bring the technology "in-house," allowing greater autonomy to marketplaces to innovate as well as to be proactive about identifying and finding solutions for technical problems. Industry experts would say, this is notable, as, by nature, code is not perfect or static. Bugs, such as website crashes or security breaches are almost inevitable.[10]

Open source technology gives those that use it access to the resources of thousands of developers across the world increasing cost-effectiveness. This large and supportive community is the centerpiece of open source software, and what makes it so distinct from off-the-shelf products. Developers work with open source software daily and have the ability to identify and offer solutions to emerging issues quicker than most commercial systems. Moreover, the rewards of open source software multiply as more people use it, so, if several marketplaces were to adopt the same open source code, they could become part of their own network of innovation and support.[11]

Making the Switch at DC Health Link

In late 2014, DC Health Link decided to make the switch from COTS products to an open source solution. The switch, it determined, would lead to better prospects for long-term sustainability and improved customer experiences. DC Health Link flagged the open source initiative in grant work submitted to the Center for Medicare and Medicaid Services (CMS), and staff kept in regular contact with CMS throughout the development and implementation of the new software.

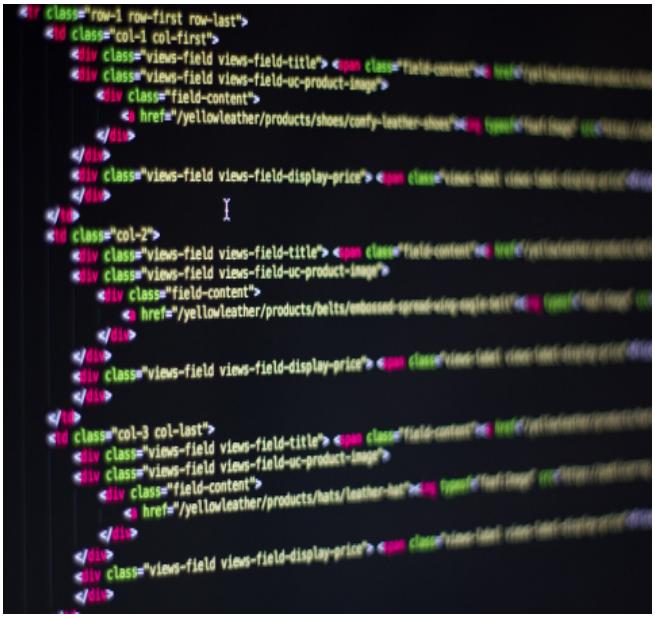
DC's local tech corridor was key to the development and launch of the new open source system. Building on an already existing internal IT team of consultants to lead development, the transition was efficient, with minimum down time of the website. In fact, when initiating the switch, DC Health Link was able to make a full migration to the new system without needing to run a parallel platform before the site went live. DC also received significant input from customers, brokers, and internal business staff to build their new system. Since making the switch, DC Health Link has witnessed many improvements.

Cost-Savings

After an initial investment in developing the open source solution, DC has seen significant reductions in costs. Eliminating annual licensing fees from their previous commercial products translated into an immediate $2.9 million in savings. Furthermore, by bringing technical systems in-house, DC Health Link eliminated spending resources on time consuming and costly change orders; previously, even simple changes to text required full code deployment and expensive end-to-end testing. Under the new system, if DC Health Link's call center notices a pattern of consumer issues arising because of a technical glitch, then its team can make immediate changes (e.g., changing language on website after hearing that consumers are confused about specific wording). This also applies to functional and user interface (UI) code changes. There is a cost for developer time, quality assurance testing of new modular functions (modular meaning it requires testing of the functions that would be affected by the changes -- which is different from end-to-end testing of the entire code replacement), and deployment by the internal operations and maintenance team.

More Agile and Responsive Systems

An immediate effect of open source code is that DC Health Link gained more ownership over their system. This enables DC Health Link to move swiftly to correct defects and address software bugs as soon as they are identified; changes can be made every day without down time. Moreover, when customers or brokers offer suggestions for improvements; those can be developed and implemented quickly. Business and operations teams can work in tandem with IT teams to address changing priorities without the constraint of an eight-month development cycle common for many private-sector vendors.



Code is a constantly evolving organism, requiring constant maintenance and new IT deployments. The agile approach and open source code means when technical issues arise, the issues are constrained and do not impact other functionality.

DC Health Link's previous system required that the system be offline during major IT deployments, resulting in productivity loss and impacting consumers. Now, updates can be made continually and without taking the system offline. This is enormously important for DC Health Link's growing small business marketplace. Long system outages during deployments can be especially disruptive for the Small Business Health Options Programs (SHOP) enrollment since small business can enroll at any time during the year.

DC Health Link staff also expresses confidence in the ability of their new system to adapt to changing policies and demands of marketplace consumers. For example, DC Health Link anticipates that 2016 will be a big year for the small group marketplace. A 2013 law that merges the individual and small group markets into the marketplace and requires all carriers to sell all products on the marketplace is in the final stages of full implementation.[12] DC's SHOP--which already covers nearly 800 small businesses--is expected to grow six-fold with these changes. DC Health Link officials are confident that the improvements to agility, usability, and website performance (1.45 second average page load time and commercially hosted government cloud with automated virtual server capacity) means that their new platform is equipped to handle a high volume of users.

An additional benefit of the new technology, is that because most of their website and enrollment functions are run by in-house teams, DC Health Link has immediate access to data they are generating. This gives staff greater flexibility and ability to develop and monitor metrics about its marketplace consumers. This data is an invaluable resource for the marketplace as accurate and timely knowledge of who is using the marketplace and how they are using it is essential for making technical improvements to website usability as well as for creating marketing strategies, policies, and goals for the marketplace.

Improved Consumer Usability

Use of an open source code also gave DC Health Link greater flexibility to design their new platform with customer and broker feedback. The website has been streamlined and simplified to improve customer experience. For example, consumers now need to "touch" only five screens (down from 28) to complete enrollment. The employer application was reduced from 22 screens to six, while employee shopping and account set-up pages have been reduced from 28 screens to five. A progress bar, similar to those seen on commercial websites, was added to help consumers track their enrollment process. Every step in the enrollment process can be completed in less than 3 minutes. On average, users spend 6.33 minutes on the site at a time.

Website improvements have also impacted the demand for assistance through DC Health Link's call centers. During the 2015-16 open enrollment season, average wait times were reduced from 8.7 minutes during the previous open enrollment to 1.5 minutes. Abandonment rates improved from 23 to six percent. DC Health Link staff directly attributes these reductions in contact center use to the vast improvements in usability made possible by the improved website. Inter-team collaboration ensures that the front-line consumer input that call centers receive goes directly to the IT staff. The current routine regression testing of new IT deployments means that buggy functions never see the light of day. All of this adds up to an easier consumer experience, meaning fewer questions and problems and a lighter volume of calls.

Challenges and Opportunities

DC Health Link has been able to use its open source code to make significant steps towards securing the sustainability of the marketplace by reducing its overhead and administrative costs. The flexibility of open source code and the autonomy it affords states makes it an attractive solution for other SBMs looking to make sustainability improvements of their own. None of this is to say that there are not challenges in moving to open source for those interested in exploring that option.

While a benefit of open source code is that it can be tailored, there are inevitable costs and challenges associated with that process. Marketplaces would need to dedicate resources to conduct a full inventory of their current systems and determine how to migrate over to the new code. There are inevitable start-up costs. Bringing additional IT functions in-house means that internal IT capabilities will need to be strengthened, either through additional staff or increased resources. DC Health Link has found there is some trade-off in this area. While they did add some open source consultants for this new system, they were able to reduce the consultants needed to support the two COTS products.

The full capabilities of open source software have not been fully examined. While DC Health Link uses open source code to run all aspects of their SHOP marketplace and for full pay individual marketplace customers, some COTS software is still used for Advance Premium Tax Credit (APTC) calculations because of DC's shared rules engine with Medicaid. While DC Health Link is developing an open source, cloud-based back-up for APTC to use when the COTS product is off-line, this is an area of future growth. DC Health Link plans to deploy their new code before the next open enrollment, but this would be uncharted territory for other marketplaces.

Challenges aside, open source code is an intriguing possibility for SBMs looking to reduce expenses, improve their web systems and consumer experiences. Low costs, and the potential of open source software for customization are particularly important benefits. As SBMs work towards a more sustainable future, we may see more states take up an open source solution of their own. DC Health Link stands ready to work in partnership with any SBMs that would like to move to an open source code solution.

The open source code from DC Health Link is available to all SBMs at the following links:

- https://github.com/dchbx/enroll (enrollment application)
- https://github.com/dchbx/cv (ACApi canonical vocabulary)
- https://github.com/dchbx/gluedb (enrollment database)

End Notes

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