

# Managing Mission-Critical Government Software Projects: Lessons Learned from the HealthCare.gov Project

By Dr. Gwanhoo Lee and Justin Brumer

## Background

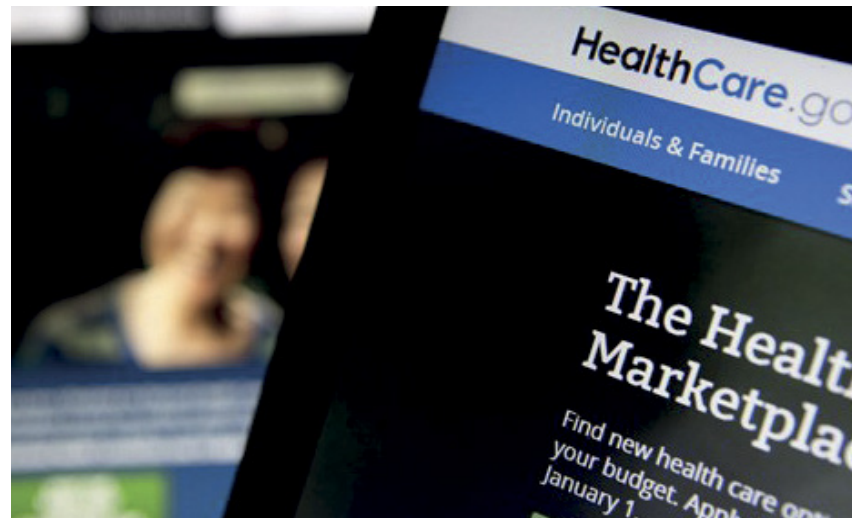
Recognized as one of the most politically contentious laws in American history, the Affordable Care Act (ACA) became law on March 23, 2010. However, ACA's implementation was soon threatened by the serious missteps of HealthCare.gov, specifically the launch of the federally facilitated marketplace (FFM).

Overseeing the implementation and management of HealthCare.gov, the Centers for Medicare and Medicaid Services (CMS) (an agency within the U.S. Department of Health and Human Services [HHS]) was charged with the responsibility to ensure website functionality. However, when enrollment began, users nationwide encountered difficulties in accessing and using the website. It would soon be discovered that the launch was a catastrophic failure with only six people signing up for health insurance on the first day.

After investigating the roll-out, many experts identified a lack of project management fundamentals as a key reason for the failure. In this article, we analyze the project challenges, the factors that contributed to the failed website launch, and the lessons learned that may help future government software projects avoid such failures.

## From Policy Formation to Program Implementation

Upon enactment of the ACA, the Obama administration needed to shift from policy formation to program implementation. The law required nearly all Americans to obtain health insurance. It also created health insurance exchanges, known as marketplaces, where consumers could shop for health plans. Even though the ACA gave states the option to create their own exchange<sup>1</sup>, only sixteen states and the District of Columbia would go onto establish their own marketplace, in part, due to issues like political partisanship, marketplace sustainability concern, or operational capacity.<sup>2</sup>

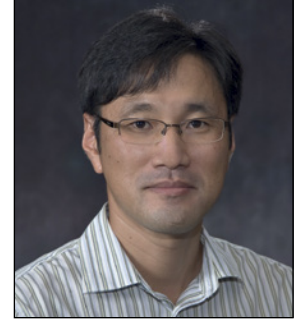


Since only a few states opted to design their own marketplace, it became mission-critical for HealthCare.gov to function effectively in order to ensure the sustainability of the ACA. The aim of the HealthCare.gov portal website was to give Americans an online platform to shop for health plans—providing a similar experience to that of purchasing services and commodities online. Without an efficient online portal website, the successful implementation of the ACA would not be accomplished. To build the system, CMS hired fifty-five contractors.

Soon after the website's failed launch, investigations occurred nationally to discover what went wrong. The findings soon made national headlines on issues such as how the initial website development cost was expected to be \$292 million and reportedly surged to \$2.1 billion<sup>3</sup>. Or that only 26,794 people had been able to enroll through the federal exchange over the entire first month, 90 percent fewer than the Obama administration had planned.<sup>4</sup>



*Justin Brumer works for the District of Columbia Department of Health's Community Health Administration, focusing on tobacco control policies and program management. He earned his MA in Public Administration from American University and his BA in Political Science from the University of California, San Diego.*



*Dr. Gwanhoo Lee is a Professor of Information Technology and Analytics in the Kogod School of Business at the American University, Washington, D.C.*

Facing the difficult choice whether to repair HealthCare.gov or completely redesign the website from scratch, the Obama administration turned to White House senior staff, to “find fresh eyes who could decide whether [HealthCare.gov] was actually salvageable.”<sup>5</sup> Convinced that the website could be repaired, the Obama administration sought a “tech surge,” bringing a team of troubleshooters from Silicon Valley to fix the website.<sup>6</sup> Six weeks after the initial implementation, HealthCare.gov was beginning to work better.<sup>7</sup> Although the tech surge eventually made the website operational, the disastrous initial launch of HealthCare.gov significantly disrupted the implementation of the ACA.

## Challenges Faced by HealthCare.gov

Designing and implementing new government policies and programs are often met with many difficulties. How an organization responds to those challenges will determine its success. Charged with designing and implementing the creation of HealthCare.gov, CMS was confronted with a barrage of political and programmatic issues from the project inception that included:

- Project complexity
- Uncertainty
- Compressed timeframe high-risk contracts
- Lack of senior leadership

**Project Complexity.** CMS and its contractors worked to develop a complex mission-critical IT system in a relatively short period of time. Obviously, coordinating all those organizations is a daunting task. Although CMS had experience in designing health programs like Medicare and Medicaid, their project planning was not effective enough to cope with the high complexity of the HealthCare.gov project.<sup>8</sup>

**Uncertainty.** The constant and abrupt policy changes contributed toward a high level of uncertainty, which significantly affected project direction and the ability to plan effectively. CMS invested substantial time resolving policy issues that should have been dedicated toward actual implementation. To add to these problems, uncertainties around project funding made it difficult to determine and prioritize the scope in contracting, staffing, and the overall direction to the project.

**Compressed Timeframe.** Despite CMS awarding funding to contractors in September 2011, the contractors did not receive substantial website specifications to start designing software until March 2013, just a few months before the release of HealthCare.gov. As a result, the contractors had very limited time to design, build, and test the system.

**High-Risk Contracts.** The contract setup with the website developers made it difficult for CMS to effectively manage them. The decision by CMS to enter into business partnerships with developers on cost-reimbursable contracts led to a lack of contract management, as well as financial restraint and control over their contractor partners.<sup>9</sup> A major issue for these contracts according to the U.S. Government Accountability Office (GAO) is that they “create additional risk because agencies like CMS are required to pay the contractors’ allowable costs regardless of whether the [project] is completed.”<sup>10</sup> Consequently, cost-reimbursable contracts have the ability to quickly run-up project expenses without actually fulfilling deliverables. This explains why the overall cost for building HealthCare.gov would result in over \$2.1 billion.<sup>11</sup>

**Lack of Senior Leadership.** The development of HealthCare.gov suffered from the lack of central leadership and involvement from CMS’s top administrators. For example, the White House chief technology officer had been kept out of the planning of the HealthCare.gov system. As a result, it was difficult for the project team to navigate

the complex technical and political landscape. Furthermore, this lack of senior leadership also made it difficult to manage the repair process later.

## Initial Failure of the Website Launch—the Key Factors

Delegated with a monumental task to design and implement HealthCare.gov, CMS made major missteps early on that would affect the website development and usability.

### Lack of Dynamic Alignment between Policy and Technology Development

Enacting policy programs that can impact over 300 million people has far-reaching complexities. It must incorporate diverse economic, cultural, social, and political values, and HealthCare.gov demanded substantial policy development and decision-making to inform technical design and website implementation. This included not only writing regulations to govern the marketplaces, but also establishing partnerships with other entities involved in implementation, such as other governmental departments, states, and insurance policy issuers. This policy work was made more difficult and protracted by a lack of certainty regarding the mission, scope, and funding for the FFM (caused in part by varying expectations for the marketplaces and a contentious political environment). The time spent developing regulations resulted in further project delays later in the process, such as states deciding whether to join the FFM and technical needs for website contracts.<sup>12</sup> Perhaps one advisor to Obama's campaign said it best about the mismanaged design and implementation of HealthCare.gov, "it's very hard to think of a situation where the people best at getting legislation passed are [also] best at implementing it . . . they are a different set of skills."<sup>13</sup> With inadequate leadership, technical expertise, strategic plans, communication, and CMS refusing to delay the initial HealthCare.gov launch despite all the early project mishaps, it was almost as if the website was doomed for failure.

### Poor Project Scoping and System Requirements Analysis

Early in the federal marketplace project, CMS did not adequately assess the technical and operational tasks required, which led to bad decisions that included:

- Underestimating operational requirements
- Selecting technical components not previously tested on a similar scale
- Not securing technology capable of increasing website capacity

- Not fully assessing the project's IT needs and not strategizing in a way that emphasized innovation<sup>14</sup>

It can be argued that in the earliest stages of the project design, CMS did not understand the project scope enough to assess the website's technical tasks. And as a consequence, they were continuously correcting problems. According to many staffers at the time, it appeared that CMS's management was dismissive of technical setbacks and unwilling to listen to the experts who were flagging concerns that so many consumers would go onto experience. Had CMS leadership involved more technical experts earlier in the planning process, then they may have better understood the challenges of designing the website and avoided technological issues.<sup>15</sup>



### Inadequate Risk Management

CMS was continually using resources to make up ground rather than move forward. Although problems with complex projects are almost inevitable, the crafting of contingency plans for high impact risks was almost nonexistent prior to the breakdown.<sup>16</sup> Contingency planning would have created the opportunity to identify potential risk mitigation strategies in advance. Ultimately, the refusal by CMS's leadership to adjust implementation plans upon these setbacks due to a lack of risk planning exacerbated the hardships and in turn, led to failure.

### Lack of Clear Leadership

CMS failed to assign and establish a clear project leader. As a new project with staff spread across CMS, the HealthCare.gov team needed unity and identity within the larger organization (especially since there were so many contractors working on multiple project platforms). The various teams all working

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to create a functioning website lacked a central leader who had a holistic understanding of the project and was able to make apt decision-making. Effective leadership would've enabled a comprehensive view across the project to better assess progress, identify problems, and determine priorities.<sup>17</sup> Leadership was also lacking beneath CMS's senior executive level, with a high turnover among officials within the agency which led to knowledge transfer issues.

### Time Mismanagement

As discussed earlier, the compressed timeframe for the technical development significantly affected the design and implementation of HealthCare.gov. CMS made unexpected last-minute changes to system requirements and technical specifications. As a result, the final months of development and implementation for HealthCare.gov were chaotic. This lack of discipline in change management, combined with mismanagement of project resources, left little time for system developers to adequately test website functionality and security.<sup>18</sup> CMS should have revised the project timeframe to accommodate the last-minute changes. Their failure to do so caused website defects, security vulnerabilities, and limited the data processing capacity.

### Go/No-Go Decision

As the project degraded further and problems became more well-known, CMS officials appear to have become desensitized to bad news. The development problems were layered and complex, the data unwieldy, and with so many project components going wrong, even the ability to prioritize became difficult. CMS officials failed to recognize the extent of problems with HealthCare.gov<sup>19</sup> and its leadership took little action to respond to internal warnings, remaining irrationally optimistic about the launch. According to the U.S. House of Representatives Oversight and Investigations Subcommittee Chairman Tim Murphy, "CMS was under no obligation to launch the website on October 1, 2013, yet did so anyway, despite the government's own programmers warning that the site was full of bugs, security holes, and well behind schedule."<sup>20</sup> Despite the many grave signals that HealthCare.gov was heading for an implementation disaster, CMS stuck to the initial October 2013 release date and refused to budge.

### Rigid Organizational Culture

CMS's organizational culture negatively impacted project progress. According to a CMS contractor, "we were never fully accepted by CMS as a whole" and because of that many contractors' website perspectives often went unheard.<sup>21</sup> Contractors' input were often left out of CMS's decision-making process, and this was also compounded by a toxic

organizational environment in which expert perspectives were routinely dismissed. One explanation offered by several officials was that the "development of the HealthCare.gov website required a 'start-up' mentality that encouraged creativity and innovation to support something new and unique."<sup>22</sup> Yet, the CMS organizational culture was more of a traditional government bureaucracy, based on rigid management methods and an established hierarchy.<sup>23</sup>

### Project Management Fundamentals

CMS's management struggled with executing established project management practices. In fact, according to the reports by the Software Engineering Institute as well as the Government Accountability Office (GAO), CMS leadership rejected well-established project management practices which included:

- Robust schedule development
- Comprehensive budget estimates
- Data management monitoring practices
- Milestone project reviews<sup>24</sup>

For example, the initial CMS project schedule did not have a plan for comprehensive activities, even though the CMS requirements management plan dictates that planning documents should estimate the effort needed to complete a project. The organizations involved in the creation of HealthCare.gov were well aware of project management fundamentals, but seemed to dismiss them regardless.



## Recommendations: How to Avoid Software Development Project Failures

Our analysis of the HealthCare.gov project reveals lessons learned that can be useful for future software projects. In the effort to implement and manage information technology enabling national policy goals and government missions, our analysis of the HealthCare.gov project reveals lessons learned that can be useful for future software projects. In the effort to implement and manage information technology enabling national policy goals and government missions, we find that it is essential to ensure the disciplined execution of project management principles that include leadership, alignment, change management, rigorous testing, disciplined decision-making, and vendor management. Our observations and recommendations are presented below:

### ***Clearly Define Leadership Roles***

When it comes to a large-scale and complex mission-critical project, it's not easy to clearly define senior leadership roles. This is in part because numerous organizations are involved in the project execution and many stakeholders may have a politically motivated interest in the project outcome. Unfortunately, the HealthCare.gov project could not overcome this challenge. It was quite revealing that no senior executive could even tell if the website was functioning in the White House meetings that took place soon after the website crashed. No one was in charge. Clearly defined leadership can provide clarity to project decisions, and enhance project coordination, consistency, and cohesion.

### ***Align Policy and Technical Solution***

When developing an information system that enables a new policy such as the ACA, it is important for project leaders to monitor ongoing policy modifications and ensure that the system stays aligned with it. While developing the HealthCare.gov website, the development team had to deal with constant policy changes. Seemingly small changes to the policy may cause profound impacts on the design and implementation of the technical solution. It is crucial for the project team to understand the dependencies between the technical solution and the policy modification to ensure that the two elements remain aligned throughout the project.

### ***Manage Changes with Discipline***

While it is important to accommodate important requirement changes, the project team should avoid major changes in a later phase of the project without fully understanding their impact. For example, the last-minute change to the method of creating a user account with the HealthCare.gov

website resulted in a dramatic increase in the number of simultaneous users and the volume of network traffic. Unfortunately, this impact was not fully understood by the project team. If a major change needs to be incorporated into the system in a later phase, a careful analysis of its impact on system performance should be conducted.

### ***Never Take a Shortcut in Software Testing***

Testing a software system thoroughly with real-world data is crucial for a successful launch. The development team should stress test the software with greater than realistic data volume under extreme network conditions. In part due to last-minute changes to system requirements, the HealthCare.gov development team did not have adequate time to fully test their website. They took a shortcut by testing it with a small scale of data rather than using realistic data volume. As a result, the system that worked fine in a lab setting could not endure the larger volume of network traffic and user access. After working on a project for years, it is tempting to bypass some of the testing procedures. However, a disciplined project team should resist this. Furthermore, a shared dashboard that shows current bugs in the system would also be helpful.

### ***Remember Murphy's Law When Making Go/No-Go Decision***

Making a go/no-go decision for a mission-critical project is a nerve-racking task, even for the most experienced managers. If the project manager (PM) receives mixed signals about the readiness of the system, the PM is better off by erring on the side of caution. Remember and be mindful of Murphy's Law that anything that can go wrong, will go wrong.



## Viewpoints

Once the software is launched with critical defects, the damage is difficult to recover from, so don't hold unrealistic expectations that somehow the system will be fine despite early warnings. Before the launch of the HealthCare.gov website, the project leaders received numerous warnings about various issues of the website as well as positive assessments that the system was ready to go. When making a go/no-go decision for a mission-critical software system, it is recommended that project leaders take a cautious approach rather than an optimistic one. It's also important that the project leader should create a safe environment in which team members can communicate openly, and challenge the project leader's opinion. In turn, this would help the project leader avoid bias.

### ***Manage Service Providers Effectively***

As the number of external service providers rises, the complexity of coordinating them increases exponentially. The large number of service providers was a significant factor for the failure of the HealthCare.gov launch. In the past, other large-scale mission-critical projects suffered from the similar problem with Boeing's 787 Dreamliner project—a case in point. Integration of the work done by different providers is often challenging, and it is important to put in place communication and coordination processes that enable all participating organizations to work effectively.

## Conclusion

The HealthCare.gov website was arguably one of the most publicized failures in the history of government software development. The botched launch awakened the American public about their government's capabilities, and as a result, forced President Obama to make multiple apologies. The website's rescue team was featured in a cover story on the March 2014 issue of *Time* magazine. Although the project faced daunting challenges, effective project management would have prevented the devastating failure. The lessons learned from the HealthCare.gov project should not be wasted. These lessons should be used to improve the outcomes of future government software projects to benefit the public, because we cannot afford to let another mission-critical project go awry. ■

## Footnotes

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3. Alex Wayne, "Obamacare Website Costs Exceed" (Bloomberg: Sept. 2014)
4. Ibid., 11.
5. Steven Brill, "Obama's Trauma Team" (Time Inc: Mar. 2014), 2.
6. Ibid., 3.
7. Ibid., 3.
8. Ibid., 2.
9. Les Chambers, "Case Study Saving Obamacare" (Chambers and Associates: Mar. 2014), 6.
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15. Ibid., 62.
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17. Ibid., i.
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