Teaching Case

The HealthCare.gov project

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Abstract
This case describes the development of the HealthCare.gov website front-end, systems and databases supporting the implementation of the Affordable Care Act. In late October 2013, US Health and Human Services Secretary Kathleen Sebelius and US Centers for Medicare and Medicaid Services Administrator Marilyn Tavenner appear before a Congressional subcommittee to apologize about system glitches. The case gives students an opportunity to consider project risks that affected this huge systems development effort, and to consider how to ensure that millions of uninsured or underinsured Americans would be able to sign up for affordable health insurance.
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Introduction

On 1 October 2013 Americans began to use HealthCare.gov to sign up for newly guaranteed health insurance coverage under the 2010 US Patient Protection and Affordable Care Act (hereafter 'the Act'). For the next 4 weeks, millions of Americans trying to sign up experienced long waits and system glitches. Public criticism, of both HealthCare.gov and US Health and Human Services (HHS) Secretary Kathleen Sebelius, was swift and brutal. Even late-night comedians ridiculed the Government's efforts to implement the new system.

The Centers for Medicare and Medicaid Services (CMS, see Figure 1) was the arm of HHS that oversaw the development and rollout of HealthCare.gov. On 29 October CMS Administrator Marilyn Tavenner apologized during a Congressional hearing:

> The initial consumer experience of HealthCare.gov has not lived up to the expectations of the American people and is not acceptable. We are committed to fixing these problems as soon as possible.
>
> (United States House of Representatives Committee on Ways and Means, 2013)

On 30 October HHS Secretary Sebelius, also testifying in a Congressional hearing (United States House of Representatives Committee on Energy and Commerce, 2013), stated her unequivocal support for the Act, which gave millions of Americans unprecedented, affordable access to high quality health care. She too apologized for the problematic launch, stating, 'I am accountable to you for fixing these problems, and I am committed to earning your confidence back by fixing the site.'

The huge HealthCare.gov systems development project had been challenging to orchestrate and manage, and the interests of many parties were at stake – including state and federal politicians, government employees, insurance companies, hardware and software contractors, and Americans seeking access to affordable health insurance. Earlier in 2013 consultants from McKinsey and the US Government Accountability Office (GAO) had expressed concerns about this project. End-to-end testing of the full, complex system, which had been scheduled to take place in July 2013, instead was not done until mid-September, only days before the nationwide launch. The 4 weeks of system failures since the launch had been a public relations disaster. Now, at the end of October 2013, the drumbeat of criticism by opponents of 'Obamacare' was nearly deafening.

What project management issues had led to this October horror story? Should Secretary Sebelius cancel the HealthCare.gov launch? Marilyn Tavenner needed to determine what still needed to be fixed in the software, and Secretary Kathleen
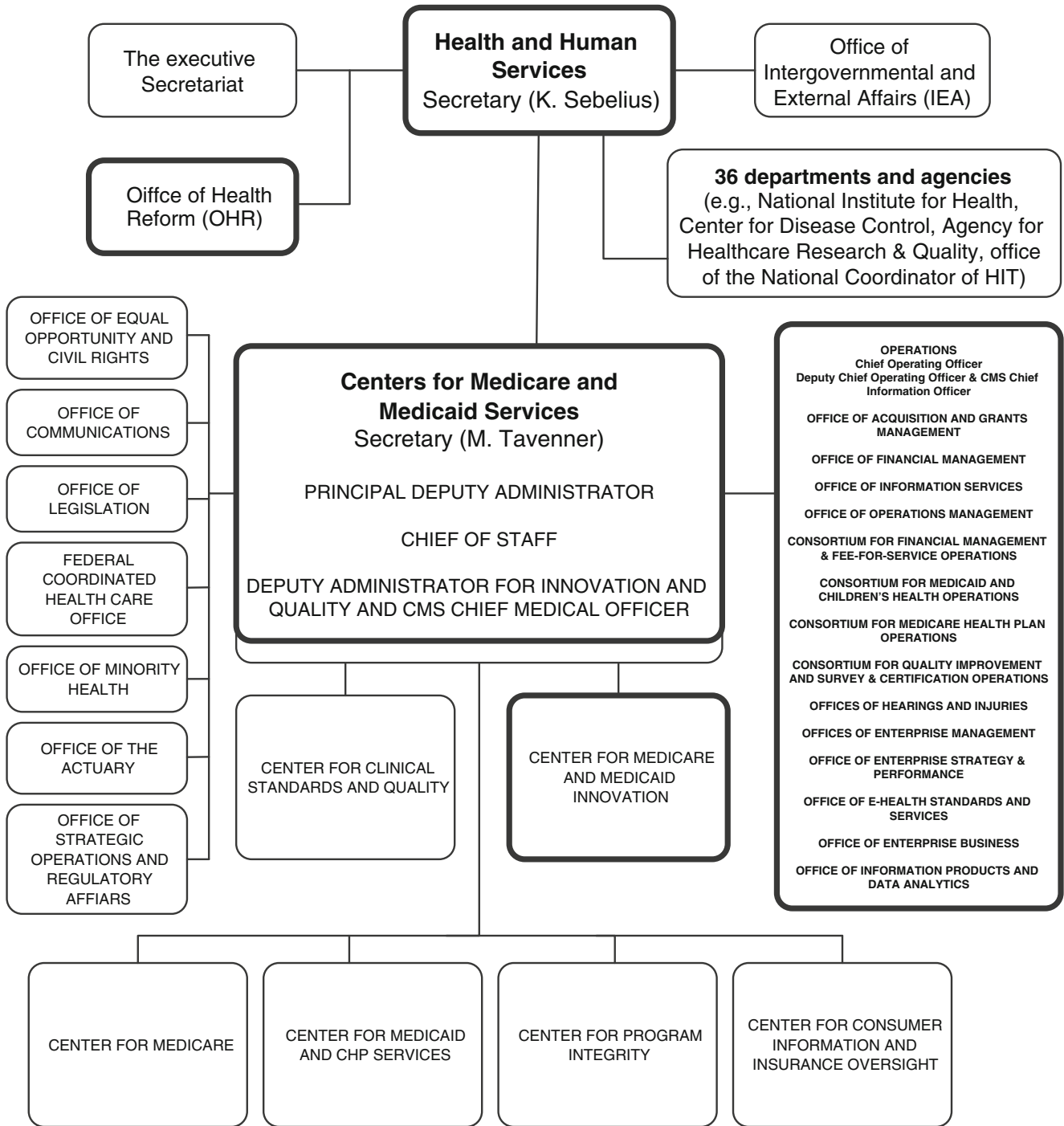
Figure 1 Organization chart for HHS and CMS as of July 2013.
Note: Bolded boxes indicate departments most involved in HealthCare.gov implementation.

Sebelius needed to know what other challenges threatened to derail the Act. What could be done to get this project back on track and to ensure that needy Americans would be able to sign up for health insurance under the Act, to go into effect January 2014?

Background: the Act and HealthCare.gov
The Act, a centerpiece of President Barack Obama's two terms in office, introduced sweeping changes into US health

care, along with controversy. In March 2010 the Act barely passed: 220 Yes, 215 No. The votes split clearly between the President's political party (Democrats: 219 Yes, 35 No) and the opposition party (Republicans: 180 No, 1 Yes). Critics on the left, who favored a national health service similar to Canada and Great Britain, felt the Act did not go far enough. Critics on the right, feeling it went too far, had challenged the Act in a US Supreme Court case. In late June 2012 the Court ruled key aspects of the Act constitutional, and President Obama's November 2012 reelection settled the question of

whether the Act would be implemented. By then, 1 October 2013 had been cast in political stone as the date when open enrollment would begin.

Information systems needed to be developed to enable millions of Americans to enroll (obtain coverage) through state- or federally run online marketplaces (applicants could also sign up in person, on paper, or by phone). The Act was 954 pages long and 2.6 MB (about as long as J.K. Rowling's *Harry Potter and the Order of the Phoenix*), and many rules and regulations had to be developed and approved by HHS in order for it to go into effect. However, with the October 2013 enrollment deadline looming, HHS could not wait for all rules to be set before starting to develop the necessary systems, including the front-end consumer interface – the HealthCare.gov website. States were given a year to decide how to carry out their responsibilities under the Act.

In Spring 2010 HHS thus faced considerable uncertainty regarding which states would choose to develop their own marketplaces or join the federal insurance marketplace; when rules would be completed; and how each sub-system would exchange data with other sub-systems. These and other factors would affect the overall system design and architecture, as well as its implementation.

In April 2010 an Office of Consumer Information and Insurance Oversight (OCIIO) was established in HHS, with OCIIO Head Jay Ansoff reporting directly to HHS Secretary Kathleen Sebelius. In September 2010 OCIIO selected Quality Software Services Inc. (QSSI) to help with a structured requirements elicitation process that would result in a high-level information system architecture and set of functional system requirements for implementing the Act's online insurance marketplaces. QSSI, founded in 1997, had offices in several southern states and had recently moved its headquarters to nearby Columbia Maryland. CMS had previously hired QSSI for other software projects, and QSSI had also built software for the US Department of Housing and Urban Development.

A US Government Accountability Office report explained that the marketplaces were

> to provide a seamless single point of access for individuals to enroll into private health plans, apply for income-based financial subsidies established under the law, and as applicable, obtain eligibility determination for other health coverage programs, such as Medicaid or the State Children's Health Insurance Program (CHIP).
>
> (GAO-13-601, 2013)

States could participate in the federal marketplace that CMS would develop, or develop and run their own state marketplace, or share responsibility with CMS. Some states delayed this decision until the 2012 Supreme Court ruling about the constitutionality of the Act. By Summer 2013, 27 states had opted to participate in the federal marketplace, 7 states chose to 'partner' with CMS, and 16 states (plus the District of Columbia) opted to build and operate their own health insurance marketplaces (Figure 2).

Only US citizens and lawful immigrants were eligible for the program. Requirements of the Act meant that the federal insurance marketplace software (with the HealthCare.gov front end) would guide applicants through a complex certification and enrollment process and coordinate information among the marketplace, federal agencies, and private insurance companies. Figure 3 provides a high-level overview of the many systems needed for the federal marketplace and links to HealthCare.gov. Federal subsidies, in the form of tax credits, would reduce costs for applicants who were not eligible for insurance through an employer, Medicare (program for older Americans), or Medicaid (program for low-income Americans) (Radnofsky, 2013). The insurance marketplace system would exchange information with the IRS (Internal Revenue Service, to verify income and tax subsidies), Social Security system (to verify residency), and state-run Medicaid systems (to determine eligibility for these programs).

Healthcare.gov system needed to interface with 34 different Medicaid systems, each with different rules and specifications for enrollment eligibility. In the US each of 50 states had authority to operate the Medicaid health insurance program for residents and children living in poverty. Each state set different income levels and other criteria for eligibility and operated its own information systems. The situation became more complex when some states attempted to opt out of mandatory 'Medicaid expansion.' The US Supreme Court ruled this tactic unconstitutional in the 2012 case.

Applicants could not be denied coverage or charged higher premiums because of preexisting medical conditions, although older applicants, tobacco users, and families with three or more children would pay higher premiums. Insurance plans were to be offered in five tiers, and all plans were required to cover 10 'essential' services. The least expensive plan, for applicants 30 years or younger and others who demonstrated financial hardship, would cover 'catastrophic' care, with low monthly costs but high deductibles and co-pays. Plans with higher monthly fees had lower co-pays and deductibles.

A recommender system was needed to guide applicants through the complex selection process to find insurance plans they were eligible for and to estimate monthly net costs, given federal subsidies. In public statements, President Obama was quoted as saying that the insurance recommender system was 'real simple. It's a website where you can compare and purchase affordable health-insurance plans, side by side, the same way you can shop for a plane ticket on Kayak' (Mclean, 2013) (Kayak.com gathered information and compared prices for airfare, hotels, and other travel services) – setting the expectation for an online, real-time, easy-to-use comparison website.

In some regions, many insurance companies offered plans under the Act, but in other regions only one company offered a qualified insurance plan. Once an applicant completed the enrollment process, his or her data had to be transferred to the chosen insurance company's information system to activate the insurance policy. The insurer would then send an invoice to the subscriber, and the marketplace would notify the IRS.

Data exchange with these established systems would be handled by the federally developed Data Hub, which would store and share data gathered from many sources. State-run marketplaces needed to securely exchange data in real time, to verify eligibility (with Social Security and Immigration) and income (with IRS information systems), using the Data Hub. Serving 34 states, the federal marketplace would use data stored in the Hub for three main functions: consumer eligibility and enrollment, insurance plan management, and financial management (payments to insurance companies, with adjustments for subsidies and other functions).
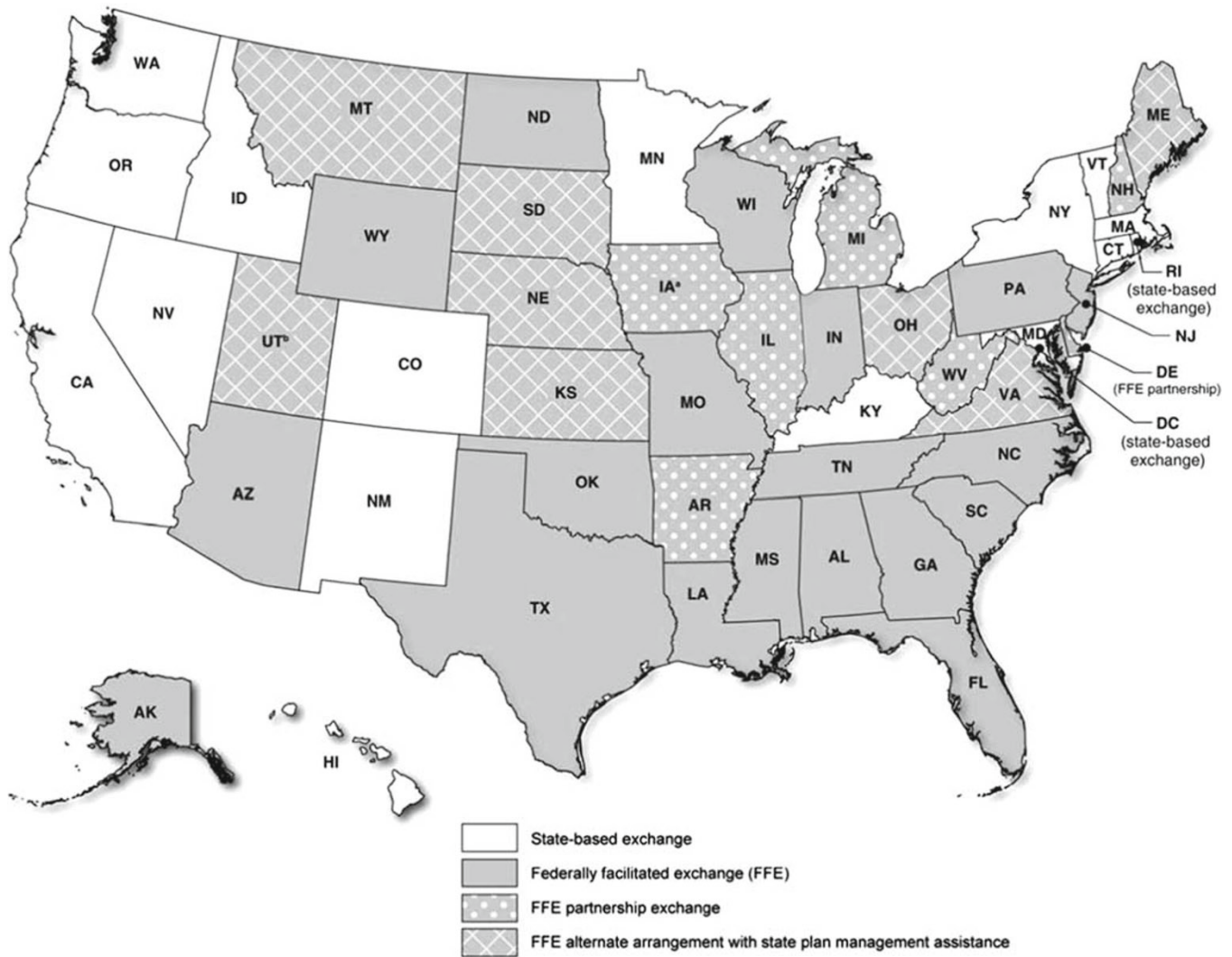
Figure 2 Planned partnerships with states and federal marketplace as of May 2013.
Note: Iowa planned to assist with the plan management function, and not the consumer assistance function. On 10 May 2013, CMS indicated that it intended that Utah would operate a state-based Small Business Health Options Program (SHOP) marketplace, but individuals would sign up for health insurance via the federally facilitated marketplace (earlier referred to as a federally facilitated exchange), for which Utah would assist with plan management.
Source: GAO-13-601 (2013: 15). Figure 1: Health Insurance Exchange Arrangements for 2014, as of 10 May 2013.

The front-end – the HealthCare.gov website – connected to the Data Hub and various software applications necessary for consumers to compare coverage and premiums of qualified health plans (QHPs), confirm their eligibility to enroll in a QHP and to receive a subsidy, apply for a specific insurance plan, and receive confirmation of enrollment. An example of back-end software (not directly visible to consumers, but accessible via HealthCare.gov) was the Enterprise Identity Management System. This system would confirm a consumer's identity and resolve discrepancies (by, e.g., identifying other applicants giving the same name or Social Security Number, which would give rise to an error message and instructions on how to resolve the problem).

Figure 4 shows the planned schedule of project deliverables to develop and implement the necessary systems before the start of enrollment on 1 October 2013 (for 2014 coverage) (United States Senate Committee on Finance, 2013). End-to-end full-system testing was scheduled for July 2013. Opening enrollment by 1 October would allow consumers time

to consider their options and choose a qualified insurance provider. Insurance companies also needed time to process applications and integrate information from the Data Hub into their own information systems.

2011 and 2012

Passage of the Act did not mean opponents quietly acquiesced to it. In November 2010, when Republicans regained control of the House of Representatives, they threatened to pull OCIIO's funding. In response, Jay Ansoff resigned, OCIIO was disbanded, and a new Center for Consumer Information and Insurance Oversight (CCIIO) was established. Under the new structure CCIIO Head Steve Larsen reported to CMS Administrator Marilyn Tavenner (not to HHS Secretary Sebelius). Furthermore, CCIIO was not solely responsible for developing the systems needed to support the Act. Instead, Larsen was told to coordinate with the CMS Office of Acquisition and Grants Management to solicit bids and evaluate vendors, and with the
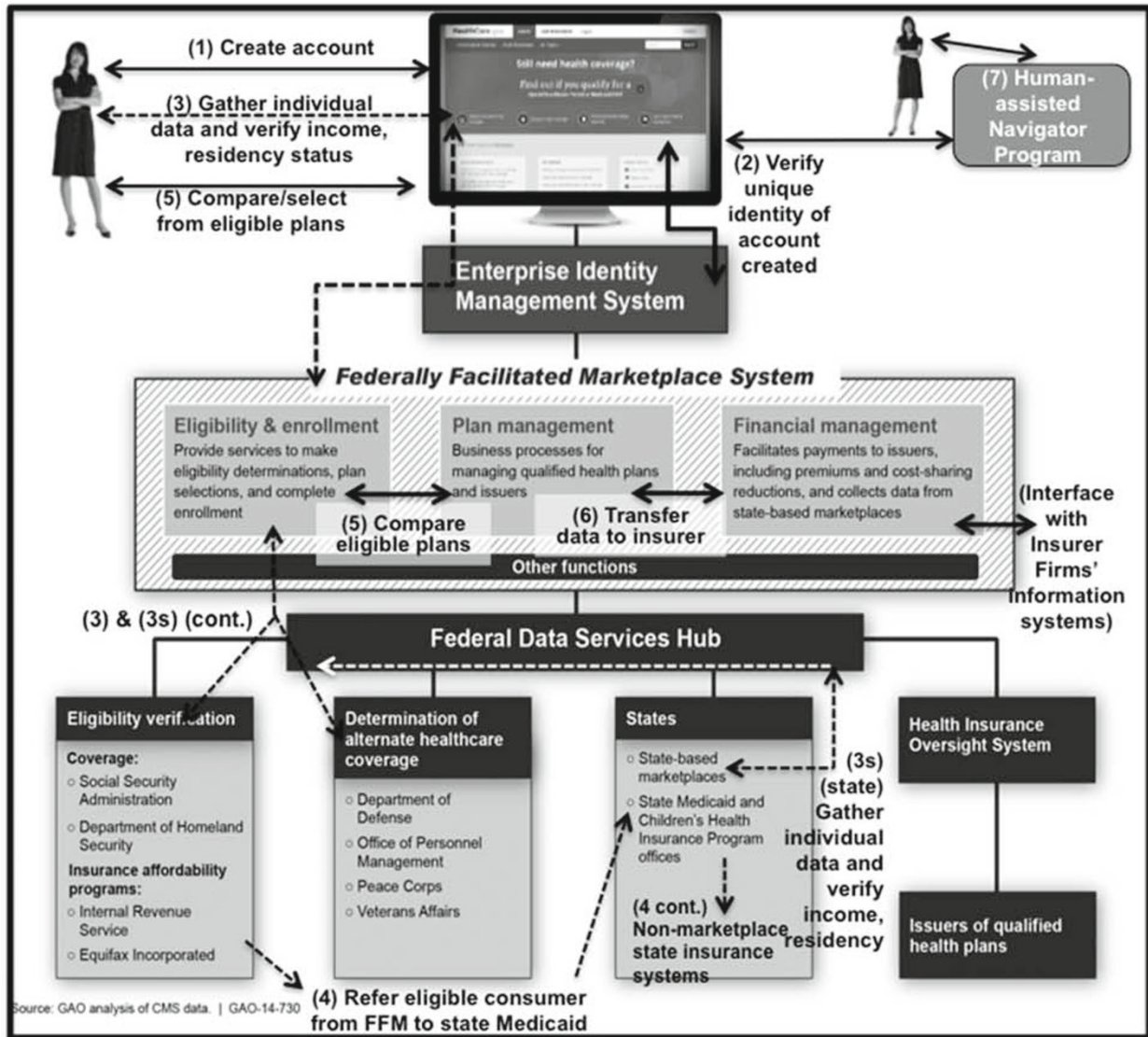
(Adapted from GAO analysis of CMS data. / GAO-14-730, p. 15)

1. Consumer uses Healthcare.gov to establish an account.

2. The Enterprise Identity Management System verifies the account as New or Existing to avoid duplicate accounts.

3. Healthcare.gov screen requests data to determine consumer eligibility. Income and residency are verified via IRS system and DHS systems. Eligibility for other insurance programs verified by other systems (e.g. Veterans Administration).

3s.Data hub performs same e-services for income and insurance program eligibility for 16 state-run insurance exchanges.

4. If income falls below poverty line, consumer is referred electronically to one of 34 appropriate state Medicaid systems.

5. Eligible consumers are presented with a comparison of available insurance plans (5 levels per insurer), along with monthly premium rates and estimates of after-federal subsidy cost to consumer. The consumer selects a plan to enroll.

6. Individual's data transferred to insurance firm's information system. Data are also maintained in the marketplace system for HHS/CMS to make payments to insurers for premiums on behalf of consumer (based on subsidy).

7. Human navigators help consumer through enrollment process via phone or paper, or may use Healthcare.gov online system on consumer's behalf.

Figure 3 Schematic of major functions and components of HealthCare.gov.
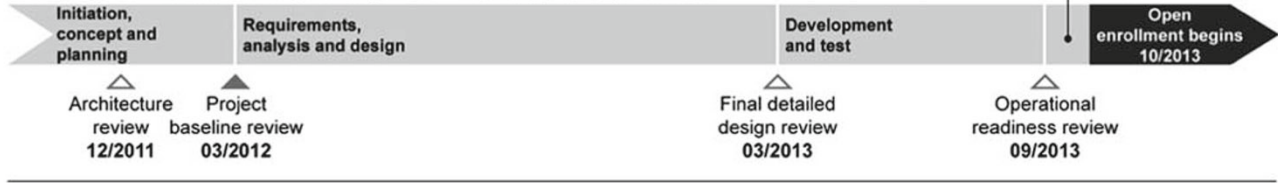*Source*: GAO Analysis of Centers for Medicare & Medicare Services Data. lGAO-14-730.

Federal data services hub

| Initiation, concept and planning | Requirements, analysis and design | Development and test | Implementation | | Open enrollment begins 10/2013 |

Architecture review
03/2012

Project baseline review
03/2012

Final detailed design review
06/2012

Operational readiness review
09/2012

Federally Facilitated Marketplace System – Initial plan (September 2011)

| Initiation, concept and planning | Requirements, analysis and design | Development and test | Implementation | Open enrollment begins 10/2013 |

Architecture review
10/2011

Project baseline review
03/2012

Final detailed design review
06/2012

Operational readiness review
03/2013

Federally Facilitated Marketplace System – Revised plan (April 2013)

Implementation

| Initiation, concept and planning | Requirements, analysis and design | Development and test | Open enrollment begins 10/2013 |

Architecture review
12/2011

Project baseline review
03/2012

Final detailed design review
03/2013

Operational readiness review
09/2013

1. Architecture review
Ensures that business needs are sound and conform to the Centers for Medicare & Medicaid Services (CMS) information technology architecture before design begins. This review also examines the proposed projects' relationship with existing systems and determines if they can be leveraged.

2. Project baseline review
Obtain management approval that the project's scope, cost, and schedule have been established and an appropriate management strategy is in place. This review also includes an assessment of risks to each baseline.

3. Final detailed design review
Ensures that the proposed design meets the stated business needs and is complete according to CMS standards prior to development. This review also raises and resolves any issues that might pose risks during subsequent phases, such as testing and implementation, and which may be more costly or require additional time to correct in the later stages.

4. Operational readiness review
Ensures that a system has completed its implementation process according to plan and is ready to enter the operations and maintenance phase. Security is a significant component of this review.
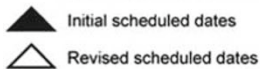
▲ Initial scheduled dates

△ Revised scheduled dates

Figure 4 Planned schedule of development milestone reviews*.
*GAO-14-694 HealthCare.gov Contracts, Page 24. Figure 4: Planned schedule of development milestones in the federally facilitated marketplace system and federal data services hub task orders.
Source: GAO Analysis of Centers for Medicare & Medicare Services Data. |GAO-14-694.

CMS Office of Information Services to refine the high-level architecture, develop requirements specifications for each system, prepare a software development project plan, develop and implement testing plans, and perform other key tasks.

Most of the necessary software was to be developed by external vendors. By July 2011 a Request for Proposal (RFP) was issued for developing the federal marketplace and Data Hub. A GAO Audit report subsequently noted that under normal circumstances it would take up to 2 years to fully document requirements for these systems. The July 2011 RFP was sent to 16 IT vendors who were already pre-qualified and well known to CMS. Four bids came in, and in September two primary vendors were chosen: CGI Federal for the federal marketplace and QSSI for the Data Hub. CGI, a Canadian IT services company with headquarters in Montreal, had an office in nearby Fairfax Virginia. CGI already was working on a large contract to modernize Medicare and Medicaid systems, and had previously worked on a successful project with the US

Environmental Protection Agency. A losing vendor protested the selection of CGI, necessitating a review that caused further delay.

By January 2012, contracts with the two vendors were finally issued. Contracts were on a 'cost-plus-fixed-fee' basis, which allowed CMS and vendors to negotiate and finalize requirements and scope of work without the constraint of a fixed budget. Over time, contracts were issued to 60 subcontractors, totaling about US$400 million in committed expenses (Table 1).

In March 2012 HHS issued a rule that provided detailed guidance about various requirements to the states. States were previously notified that by December 2012 they must submit a Declaration of Intent to either run their own state marketplace or participate in the federal marketplace. When some states protested that this was not enough time to make an informed decision, the deadline for the hybrid 'partner' option was extended to February 2013. Stretching this deadline introduced further uncertainty about the scope of work that needed

Table 1 Total Contract Commitments to Contractors (March 2010–June 2013)

Key contractors	Contract amounts and descriptions
CGI Federal Inc.	$88 million to develop information systems, data services, and web infrastructure to support web portals, health benefit exchanges, health insurance oversight system, provide plan finder application, and provide services for federal exchange[a]
Quality Software Services Inc.	$55 million to support technology programs and enterprise project life-cycle tasks, develop systems for data services hub (interface point for all federal partners), provide infrastructure for identity management and authentication services, and provide system test expertise and services[a]
Booz Allen Hamilton	$38 million to facilitate in the creation of exchange datacenter and accompany technical services and develop security practices/protocols[a]
National Government Services Inc.	$32 million for exchange consumer call center and SHOP premium aggregations[b]
The Mitre Corporation	$22 million to help implement and manage federally facilitated marketplace program, secure the Act entities, facilitate implementation of security operations program, and security testing[a]
Logistics Management Institute	$19 million to develop health plan management, rate analysis and benefit package review, SHOP and employer-exchange operations, and manage health plan rate benefit package[b]
DEDE Inc DBA Genova Tech	$16 million for IT requirements gathering and to develop technical architectures and mock-ups, identify cost-effective IT solutions, develop testing strategy for health insurance exchange, develop system designs and data flows, and test data requirements[a]
Terremark Federal Group	$15 million to develop scalable and compliant cloud computing services[a]
IDL Solutions	$9 million to develop enterprise data management system for capturing, organizing, aggregating, and analyzing information for CCIIO[a]

Other contractors and contract amounts (thousands of dollars)					
Navigant Consulting Inc.	$8950	Northrop Grumman Information Tech	$1915	DHHS/NIH/NCI	$358
KPMG LLP	$8127	Government Acquisitions Inc.	$1721	Noblis Inc.	$350
Lockheed Martin/Services Inc.	$7067	Econometrica Inc.	$1566	Urban Institute	$300
Quality Technology Inc.	$7047	DHHS/Office of the Secretary	$1347	General Services Administration	$244
Research Triangle Institute	$6073	NORC	$1107	Carasoft Technology Group	$238
A Reddix and Associates Inc.	$5551	Innosoft Corporation	$1001	Blast Design Studio Inc.	$198
Creative Computing Solutions	$5305	National Opinion Research Centera	$970	Corporate Executive Board	$187
Aquilent	$5255	George Washington University	$958	DHHS Program Support Centera	$163
Acumen LLC	$4790	Fedresults Inc.	$901	Duty First Consulting LLC	$142
Salter Mitchell Inc.	$4355	SSA	$900	ISOM Events	$68
Tantus Technologies Inc.	$4098	Verizon	$774	Truven Health Analytics Inc.	$60
Opera Solutions, LLC	$3999	DHHS/ACF	$748	Foresee	$45
Turning Point Global Solutions	$3040	Global Tech Inc DBA EglobalTec	$647	Onix Networking Corp	$44
SAIC	$2871	DHHS/PSC	$448	Government Printing Officea	$3
L&M Policy Research	$2708	Wakely Consulting	$432	Office of Personnel Management	$3
Deloitte Consulting	$2130	Professional and Scientific Assoc.	$408	DHS/FLETC	$2
Spherecom Enterprises Inc.	$1991				

[a]http://oig.hhs.gov/oei/reports/oei-03-14-00231.pdf.
[b]http://www.gao.gov/assets/660/655291.pdf.

to be completed on the federal marketplace by Summer, since states' IT architectures, databases, and capabilities varied.

Among the federal rules and regulations that needed to be established in order to implement the Act were those that would verify whether particular insurance products complied with the Act's many requirements (such as covering the 10 'essential services'). In addition to requirements driven by rules and regulations, other requirements were specified by participants. For example, for confidentiality reasons insurance companies demanded that the IT architecture be modified so that a separate server would process their enrollment and claims data. This added to the scope of work, including adding a new layer of necessary systems testing.

Most insurance companies relied heavily on relational databases (which organize data as columns representing fields and rows representing records). Across the insurance industry there was a great variety of definitions and formats for data describing customers, products, and transactions. For example, in one relational data model three fields might represent a date of service as alpha month–numeric day–numeric year (December-05-2013), while another model might use numeric year–numeric month–numeric day (2013-12-05). This latter choice could be represented as three separate fields (year, month, day) or one field (20131205). To exchange date-sensitive data, companies could agree to convert their date fields to an agreed-upon model, or they could develop middleware software that would temporarily translate data in

order to share it. When middleware was used to translate many data fields across many organizations, its complexity gave rise to several new challenges (such as difficulty keeping systems up to date and difficulty in grasping all the inter-relationships among data elements). Different insurance companies might also use different customer identifiers, since in the United States there was no standard for individual identification within health care, and some privacy advocates objected to using Social Security Numbers for this purpose. Variation in customer identifiers made it difficult for companies (and the HealthCare.gov system) to confirm individual identities or to spot individuals who were listed as customers in two different insurance companies' databases.

To address data integration issues between the Data Hub and federal marketplace, CMS chose to use a query language called NoSQL, which was touted as a tool that could query both a relational database and less-structured data (data organized as documents, e.g., rather than in tables of columns and rows). Use of NoSQL allowed organizations to share data without needing to agree on a single standard data model, and ostensibly with less expensive middleware. However, few database professionals had NoSQL expertise, whereas many database experts used SQL (Structured Query Language), the prevailing query language for relational databases.

Given that the complex requirements for the Data Hub and systems comprising the federal marketplace were unknown when the project began and that they would evolve over time, CMS and its vendors adopted an 'agile' approach to project development. Agile development emphasizes close collaboration between programmers and functional (business) area experts, face-to-face rather than written communication, and delivery of system functionality in small increments. Responding to change rather than up-front contract negotiations and a detailed plan are emphasized, with the expectation that agile development produces more useful software solutions. Although agile methods had been used extensively in the IT industry for more than a decade, CMS had little experience with this approach to software development when the HealthCare.gov project began.

By Spring 2012, contractors were working on the Data Hub, Identity Management System, and Marketplace.

Spring and Summer 2013
In early Spring 2013, HHS engaged McKinsey & Company to review the HealthCare.gov project. The McKinsey report, delivered to Secretary Sebelius and other high-ranking officials, noted that significant work remained and that systems testing would be delayed. In June 2013 a similar report, issued by the GAO (GAO-13-601, 2013), commented positively on some aspects, but expressed concern that some key activities were behind schedule. On page 21 that report stated:

> CMS has many key activities remaining to be completed across the core exchange functions – eligibility and enrollment, including development and implementation of the Data Hub; program management; and consumer assistance. … As of April 2013, CMS indicated that it still needed to complete some steps to enable [marketplaces] to be ready to test development of key eligibility and enrollment functions, including calculation of advance payments of the premium tax credits and cost-sharing subsidies, verification

of consumer income, and verification of citizenship or lawful presence.

By May 2013 testing with the IRS was planned to be completed, and by July Service Level Agreements were to be in place with partner agencies and states. By September external testing with partner agencies and states was to be completed(Gerencher, 2013). Between 1 May and the 1 October launch, data for each QHP was to be verified and transferred from states and insurance companies to the federal marketplace. The GAO concluded:

> … certain factors, such as the still-unknown and evolving scope of the exchange activities CMS will be required to perform in each state, and the large number of activities to be performed – some close to the start of enrollment – suggest a potential for implementation challenges going forward … Whether CMS's contingency planning will assure the timely and smooth implementation of the exchanges by October 2013 cannot yet be determined.
> (GAO-13-601, 2013)

Before publishing such reports, the GAO offered audited organizations an opportunity to respond in writing. The reply from HHS stated: 'HHS is extremely confident that on October 1, the Marketplace will open on schedule and millions of Americans will have access to affordable quality health insurance.'

By August 2013 CMS was in the final stages of building HealthCare.gov, the Data Hub, and various back-end applications needed for the federal marketplace; end-to-end testing had not yet been done. States that ran their own insurance marketplaces were preparing to share some data with Health-Care.gov in order to verify patient eligibility for coverage and subsidies. Some states were nearly ready, but other state projects were dangerously behind schedule. Still, the CMS project moved forward toward its 1 October implementation date.

The Act implementation rules required that a call center and a small army of 'navigators' assist consumers through the process of selecting insurance. In August 2013, millions of dollars in grant funding was provided to community organizations in 34 states, to train navigators (Schatz, 2013). Republican leaders who opposed the Act (including some in states participating in the federal marketplace) 'raised various objections about the navigator program,'(Schatz, 2013) such as: navigators might not protect enrollees' privacy, might inappropriately act as insurance brokers, or might provide advice about contraception and abortion coverage (contrary to some lawmakers' religious beliefs).

Fall 2013
In mid-September 2013 end-to-end full-system testing was finally conducted, revealing a long list of issues but confirming that much of the functionality was valid. Political opposition to the Act was voiced widely and loudly, but HHS held firm with the planned 1 October 'go live' date. As October drew near, news stories reminded readers of key elements of the Act (such as income tiers for obtaining subsidies and that Americans must obtain health coverage or pay a penalty) (Johnson, 2013). *The Wall Street Journal* reported that a threatened Republican-led

government shutdown (motivated primarily by opposition to the Act) would not delay the launch of HealthCare.gov:

(HHS) has proven adept at cobbling together funds amid congressional resistance. It is using about $1.5 billion from internal programs to introduce its new online marketplace and technical systems … after Congress refused the Obama administration's funding requests. … Getting a passport or seeing pandas at the National Zoo would be more difficult if the government shuts down, but consumers should still be able to shop for health insurance on new online marketplaces … set to open Oct. 1.

(Schatz, 2013)

HealthCare.gov launched on 1 October as scheduled. Soon, news reports highlighted problems with the website.

The health-insurance marketplaces at the center of President Barack Obama's health law saw a surge of consumer interest Tuesday that surprised even many of the law's backers. But the debut proved patchy, with few applicants actually able to buy coverage on clogged websites that were bedeviled with technological problems. Federal officials said more than 2.8 million visits between midnight and late afternoon contributed to long wait times … 'This gives you a sense of how important this is to millions of Americans around the country,' President Obama said Tuesday. 'And we're going to be speeding things up in the next few hours to handle all of this demand that exceeds anything that we had expected.'

(Weaver *et al.*, 2013)

Multiple issues plagued the HealthCare.gov system. The consumer's wait time for a page to load was long, not nly because of higher-than-expected user demand on the computer servers, but also because of a design issue. Consumers could not see insurance options until they successfully established an account. This meant all consumers had to be processed through the enterprise identity management module every time they accessed the system, as well as clear the federal data services hub for eligibility assessment to establish an account, before they could view any insurance plans (see Figure 3). This increased the chances that a consumer's data would 'fall between the cracks' of the many system modules. Further complicating the processing were the number and variety of external system interfaces, all with different criteria: 34 state Medicaid systems for states utilizing the federal system, 16 states with their own marketplaces, and the myriad insurers and their information systems across the 50 states. The implementation plan did call for a backup system of human 'navigators' to help consumers establish accounts and review options. However, opponents in Congress and in some states had stymied efforts to hire and train navigators, so that in the initial weeks many consumers were left on their own trying to penetrate HealthCare.gov.

Meanwhile, the threatened government shutdown did take place, starting 1 October. Although essential personnel continued to work, as did contractors working on various system components, a 19 October article said: 'Efforts to resolve website problems came as the government shutdown sent home half of Mrs. Sebelius's 80,000 employees' (Langley, 2013).

Problems with HealthCare.gov were multiple and interacting. Besides volume-related wait times, system 'glitches' related to calculating applicant subsidies were also reported. *The Wall Street Journal* reported that critics 'were quick to seize on the glitches as a sign that its implementation is being rushed, and to argue that a delay, which some congressional Republicans have demanded as a condition of ending the government shutdown, is needed' (Weaver *et al.*, 2013).

Nine million unique visitors logged on to the site by Friday, 4 October. On Monday, 7 October, newspapers reported that applicant identities could not be verified on HealthCare.gov and on some of the 16 state insurance marketplaces. *The Wall Street Journal* further reported:

Six days into the launch of insurance marketplaces created by the new health-care law, the federal government acknowledged … it needed to fix design and software problems that have kept customers from applying online for coverage. …. The online marketplace [also] needed more server capacity ….

(Langley, 2013)

By 11 October reporters had noticed a particularly problematic feature: users had to register on HealthCare.gov and be verified in various systems before they could browse for information about different insurance plans. Technically, this meant that users

must cross a busy digital junction … in which data are swapped among computer systems built or run [by CGI Group Inc., QSSI, Experian PLC, and Oracle.] The main bottleneck … occurs as the slate of registration systems intersect with Oracle Identity Manager, a software component embedded in a government identity-checking system. (Weaver and Radnofsky, 2013)

An Oracle spokesman said this component was used in many systems worldwide; the problem was because of other contractors' configurations, not with the Oracle software.

A federal '834' form contained an applicant's name, address, contact information, and Social Security Number. In October, data errors occurred in about one in every four 834 forms, leading insurance companies to complain about receiving duplicate or missing forms and inaccurate information. As other HealthCare.gov problems got fixed, more people were able to enroll, which then created more problems for the insurance companies who had to manually resolve data quality issues in the digitally submitted 834 forms. QSSI was working with insurance companies to resolve these problems.

Other problems arose in the exchange of data between HealthCare.gov and some state Medicaid systems. Records of more than 183,000 people who applied for coverage under the Act but were found instead to be eligible for Medicaid (based on low income) were supposed to transfer automatically to the Medicaid system in their state. Some states – such as Texas – refused to receive these data streams for reasons that included data quality issues and varied state Medicaid eligibility requirements (Medicaid is not standardized across all 50 states).

Criticism continued unabated in the news and in the halls of Congress. Republican Senator Marco Rubio stated, 'In the

Table 2 Excerpts from statement by US HHS Secretary Kathleen Sebelius before the US house of representatives committee on energy and commerce, 30 October 2013

I left my position as Governor of Kansas, 4½ years ago, for the opportunity to continue work I have been doing for most of my over 35 years of public service – to expand the opportunities for all Americans, regardless of geography or gender or income, to have affordable health coverage. … Millions of Americans are uninsured or underinsured – people who have some coverage at some price for some illness, but have no real protection from financial ruin and no real confidence that they will be able to take care of themselves and their families if they have an accident or an illness. And for them, a new day has finally come.

In these early weeks, access to HealthCare.gov has been a miserably frustrating experience for way too many Americans … I am as frustrated and angry as anyone, with the flawed launch of HealthCare.gov. So let me say directly to these Americans: You deserve better. I apologize. I am accountable to you for fixing these problems. And I am committed to earning your confidence back by fixing the site. We are working day and night, and will continue until it's fixed. … Our extensive assessment has determined that HealthCare.gov is fixable. I want to just outline a couple of the improvements we've made to date.

1. We now … can process up to 17,000 account registrations per hour, or nearly 5 per second.
2. Instead of some users seeing a blank screen at the end of the application process, they can now see whether they are eligible for financial assistance, and make more informed decisions.
3. … Customers can now shop for plans quickly – filtering plans takes seconds, not minutes.
4. Users are getting fewer error messages and timeout messages ...
5. The system has been strengthened, with double the number of servers, software that is better optimized, and a high-capacity physical database, which replaces a virtual system.

The Chairman referred to outages this weekend and again yesterday. … If you read the statement of Verizon who hosts the cloud service, it is the Verizon server that failed, not HealthCare.gov ...

We still have a lot of work to do. We have a plan in place to address key outstanding issues. It includes fixing bugs in the software that prevented it from working the way it is supposed to, and refreshing the user experience so folks can navigate the site without encountering error messages, timeouts, and slow response times.

By the end of November, we are committed that the vast majority of users will be able to review their options, shop for plans, and enroll in coverage without the problems way too many have been experiencing... We are still at the beginning of a six-month open enrollment, which extends through the end of March, and there is plenty of time to sign up. And to just put it into perspective: The average open enrollment for an insurance plan is two to four weeks. The new Marketplace has a 26-week open enrollment, and those who enroll by December 15th, will be able to access their benefits on day 1.

Even with the unacceptable problems with HealthCare.gov, which we are committed to fixing, the Affordable Care Act, by any fair measure, is working for millions of Americans, who are benefitting from new health security – young adults; Americans living with pre-existing health conditions; seniors on Medicare.

The 85% of Americans who already have health coverage are protected with new rights and benefits. The 15% of our neighbors and friends who are uninsured have affordable new options in a competitive market.

And cost growth for health care is lower than it's been in years.

Millions of Americans are clearly eager to learn about their options, and to finally achieve health security made possible by the Affordable Care Act.

And my commitment is to deliver on that promise.

Last revised: October 30, 2013

Source: http://www.hhs.gov/asl/testify/2013/10/t20131030.html.

21st century, setting up a website where people can go on and buy something is not that complicated' (Radnofsky and Weaver, 2013).

On 21 October HHS hired a team of IT experts to help analyze and fix HealthCare.gov, in a 'tech surge' led by Jeffrey Zients. A former Bain & Co consultant and trusted advisor to President Obama, Zients had taken a similar role in 2009, when the 'Cash for Clunkers' website did not work properly – earning him the nickname 'Mr. Fixit' (Cash for Clunkers was

an economic stimulus program that paid Americans to retire gas-guzzling older cars).

In Congressional hearings in late October, contractors defended their firms' software components, claiming they worked fine in independent unit testing. End-to-end testing had revealed problems, but some contractors testified that they 'couldn't name who in the government was responsible for addressing the problems or making key decisions….' A spokesman for CGI (responsible for the HealthCare.gov

consumer interface) claimed: 'Our portion of the application worked as designed' (Parkinson, 2013). Jeffrey Zients also learned of conflicts between the CMS IT unit and CCIIO, which was now headed by Gary Cohen (who had replaced Steve Larsen) (Weaver and Radnofsky, 2013).

To improve coordination and control, Zients announced he would immediately establish systems for closely monitoring progress on work that remained to be completed. Managers were responsible for reporting progress on weekly goals for every subproject of the HealthCare.gov initiative. Color-coded charts would track progress on a daily basis (and sometimes, as frequently as twice hourly). On 26 October, Zients announced that QSSI (contractor working on the Data Hub) would serve as lead contractor for all HealthCare.gov projects going forward.

On 29 October the HealthCare.gov site crashed. For about 16 h applicants' identities, whether on HealthCare.gov or the 16 state marketplaces, could not be verified and applications could not be processed. Testifying at the 30 October Congressional hearing (Table 2), HHS Secretary Kathleen Sebelius stated that some outages were because of Verizon, host of the cloud service. She also alluded to other problems with unspecified vendors:

> CMS has a track record of successfully overseeing the many contractors our programs depend on to function. Unfortunately, a subset of those contractors for HealthCare.gov have not met expectations.
> (United States House of Representatives Committee on Energy and Commerce, 2013)

At that hearing Secretary Sebelius also itemized the key steps taken by HHS: bringing in 'Mr. Fixit' and a SWAT team of technical experts to deal with 'bugs and problems in the system' and designating QSSI as lead contractor.

Despite these assurances, on 31 October, a newspaper reported that President Barack Obama's job approval had 'sunk to an all-time low' of 42% (King and Prang, 2013). Political pressure to delay or even cancel the rollout of HealthCare.gov continued to boil, and even supporters of the program and the President expressed skepticism and concern.

Student preparation questions
An IT project executive sponsor (such as US HHS Secretary Kathleen Sebelius) needs assurance from the project manager that it will be managed commensurate with its risk profile. If a project is particularly risky the sponsor may need to allocate additional resources to it, offer visible support to it, or take other steps that complement the project manager's work. Therefore, the sponsor and/or steering committee should be briefed about likely IT project risks before a project begins, and receive updates as the project moves through various stages. Prepare to actively participate in the case discussion by considering the following questions, in light of an article by Gogan *et al.* (1999), which identifies six project risks important to executive sponsors and steering committees: project size, degree of definition, technology familiarity, organizational readiness, system interdependence, and time pressure.

1. Consider the situation that existed when the Act was signed into law in March 2010. Prepare a *prospective* IT project risk analysis: Taking into consideration only what was

known in March 2010, what challenges did the HealthCare.gov project face?
2. Between March 2010 and 31 October 2013, what factors and events led to the schedule slippage? Prepare a *retrospective* IT project risk analysis.
3. Now take a deeper dive into the system. Consider the seven process steps annotated on case Figure 3, which provides a high-level architecture of the federal health-care insurance marketplace: What problems were experienced at each process step? To what extent might these problems have been avoided through more effective project oversight and management and with what types of actions?
4. 'Mr. Fixit' (Jeffrey Zients) has been appointed to oversee a 'tech surge' to turn this troubled initiative around. Suppose you are on Mr. Zient's team. On 1 November 2013 you have been asked to bring him up to date about risks that continue to threaten this project, and to offer advice on how to mitigate those risks as the open enrollment period continues into Spring 2014.

References

GAO-13-601 (2013). Status of CMS Efforts to Establish Federally Facilitated Health Insurance Exchanges: U.S. Government Accountability Office, 2.

Gerencher, K. (2013). Get ready to enroll in exchanges. *The Wall Street Journal*, Eastern Edition 18 August: A3.

Gogan, JL, Fedorowicz, J and Rao, A. (1999). Assessing Risks in Two Projects: A strategic opportunity and a necessary evil, *Communications of the Association for Information Systems* **1**(15).

Johnson, A. (2013). What you need to know about the Affordable Care Act. *The Wall Street Journal*, Eastern Edition 29 September: A1.

King, N., Jr. and Prang, A. (2013). More voters turn on Obama. *The Wall Street Journal*, Eastern Edition 31 October.

Langley, M. (2013). 'It's tough to take these shots': Health law's rocky debut puts Sebelius in cross hairs. *The Wall Street Journal*, Eastern Edition 19 October: A1.

Mclean, B. (2013). Accounting for Obamacare: Inside the company that built HealthCare.gov. *Vanity Fair*, 22 December.

Parkinson, J. (2013). Obamacare website contractor Shirk Blame for foul-up. ABC World News 24 October [www document] http://abcnews.go.com/blogs/politics/2013/10/obamacare-website-contractors-shirk-blame-for-foul-up/.

Radnofsky, L. (2013). How will the subsidies work? *The Wall Street Journal*, Online 30 August.

Radnofsky, L. and Weaver, C. (2013). Balky exchange set to get tech help. *The Wall Street Journal*, Eastern Edition 21 October: A6.

Schatz, A. (2013). Shutdown unlikely to curb Affordable Care Act funds. *The Wall Street Journal*, Eastern Edition 25 September: A4.

Schatz, A. (2013). Groups get $67 million to promote health exchanges. *The Wall Street Journal*, Online 15 August.

United States House of Representatives Committee on Energy and Commerce (2013). Oral testimony on Affordable Care Act implementation, 30 October, Washington DC: Government Publishing Office (statement of Kathleen Sebelius, Secretary, U.S. Department of Health and Human Services (HHS)) [www document] http://www.hhs.gov/asl/testify/2013/10/t20131030.html.

United States House of Representatives Committee on Energy and Commerce (2013). Oral testimony on Affordable Care Act implementation, 30 October, Washington DC: Government Publishing Office (statement of Kathleen Sebelius, Secretary, U.S. Department of Health and Human Services (HHS)) [www document] http://www.hhs.gov/asl/testify/2013/10/t20131030.html.

United States House of Representatives Committee on Ways and Means (2013). Hearing on Affordable Care Act implementation, 29 October, Washington DC: Government Publishing Office (statement of Marilyn Tavenner, Administrator, U.S. Department of Health and Human Services (HHS)) [www document] http://www.hhs.gov/asl/testify/2013/10/t20131029.html.

United States Senate Committee on Finance (2013). Health insurance exchanges: Progress report, 14 February, Washington DC: Government Publishing Office (statement of Gary Cohen, JD, Deputy Administrator and Director, Center for Consumer Information and Insurance Oversight, Centers for Medicare and Medicaid Services) [www document] http://www.hhs.gov/asl/testify/2013/02/t20130214.html#.

Weaver, C., Martin, T.W. and Radnofsky, L. (2013). Capital digs in for long haul: Health-law debut beset by tech woes as consumers clog exchange websites. *The Wall Street Journal*, Eastern Edition 2 October: A1.

Weaver, C., Ovide, S. and Radnofsky, L. (2013). Software and design defects cripple health-care website. *The Wall Street Journal*, Eastern Edition 7 October: A1.

Weaver, C. and Radnofsky, L. (2013). Health site stymied by lack of direction. *The Wall Street Journal*, Eastern Edition 28 October: A1.

Weaver, C. and Radnofsky, L. (2013). Health exchange's flaws pinpointed. *The Wall Street Journal*, Eastern Edition 11 October: A4.

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