

An Oracle White Paper
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Getting Ready for 2014:

Oracle's Best Practices for Integrating Health Reform and
Human Services Initiatives

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Executive Overview

With all the recent political consternation surrounding healthcare reform it is easy to forget that there was consensus on all sides that it was needed. And, while everyone may not agree on the exact course of action that needs to be taken, there is general agreement that the highest per capita spend on healthcare in the world at \$8,046 and 17.9% of our gross national product in 2009¹ should not have percentage of people without health insurance increased to 16.7% in that same year.² Indeed, the number of uninsured between now and full implementation of the Patient Protection and Affordable Care Act (PPACA) in 2013 should not be expected to raise to 25%³ when, at the same time, healthcare expenditures are projected to increase to 19.3% of our GNP or a per capita of \$13,387 by 2019.⁴ In essence, the pre-PPACA environment is unsustainable and, while both proponents and detractors of current PPACA plans would agree that the new legislation is not perfect, for example, it does not *directly* address tort reform or the cost of drugs and medical instrumentation or any of the social factors related to health – obesity and dietary choices, substance abuse, or poverty; the PPACA is none-the-less a comprehensive effort to change the adverse dynamic of fewer people covered for incrementally higher per capita expenditures with minimal positive change in overall health metrics.

Standing up the State level platforms will not be as simple and strait forward as many of the proponents would like to believe nor as insurmountable as its detractors are claiming. Aside from the risks incurred such as schedule delays potentially leading to States missing the deadlines, poor uptake upon launch by consumers, threats of competition from private exchanges set up by insurance companies and retail brokers, or even States passing on costs to HIX consumers offsetting their subsidies to make the exchanges financially self-sustaining, the approach taken from an IT perspective will greatly impact the risks and cost associated with design, initial operational costs and long-term maintenance.

This white paper provides a high-level outline of Oracle's vision for most effectively, efficiently and rapidly meeting the State-level Health Insurance Exchange, (HIX) 2014 deployment

mandate while at the same time continuing – and hopefully accelerating - modernization of and integration across existing State-run health and human services programs. Increasingly, States see a need to take a more holistic approach to viewing the needs of their citizens across all available State and local health and social services programs – both public and private. Based on our long history of work with private health payers and providers and Public sector agencies and institutions across the health and human services, criminal justice, tax and revenue management and other government functional areas at the international, national, State and local government levels, we have quickly established a position in support of early innovators in Health Information Exchange (HIE) and HIX reference design and deployment efforts in several States.

This white paper is recommended for State-level health and human services administrators and their financial, business analyst, and IT executives who need to familiarize themselves with Oracle's solution components, our customer's best practices, and successful references in core areas relevant to HIX. However, it is not meant to replace guidance provided by the Centers for Medicare and Medicaid's Center for Consumer Information & Insurance Oversight (CCIIO) nor the Office of the National Coordinator for Health Information Technology; it is assumed that the reader is either already familiar with these reference architecture guidelines and the functional scope of an operational Health Insurance Exchange (HIX) envisioned or is planning to review them as part of their HIX design, development and deployment preparation efforts. Instead, this document provides a more comprehensive treatment of how key elements of the reference architecture impact its ability to address the full scope of expected HIX operational functionality. It is the position of this paper that many of the key components cannot be looked at entirely in isolation but must be part of a modular and open commercial-off-the-shelf (COTS) platform that, in turn, is targeting a more comprehensive and integrated State-run programs, focused on outcomes.

Introduction

The PPACA's core mission is: 1) to reverse the trajectories of raising insurance premiums (\$5,049 for single coverage and \$13,770 for family coverage)⁵; 2) significantly reduce the rolls

of the uninsured which exceeded 50 million in 2010⁶; and 3) improve the overall health of our population while decreasing the fraction of our GDP devoted to healthcare as quickly as possible. The Healthcare Reform legislation does this by leveraging existing commercial insurers and public payers – most notably Medicaid – as well as public and private healthcare providers but modeled to come as near to universal coverage found in socialized medicine oriented systems as possible. The legislation's implementation does this through mandated coverage of the vast majority of US residents (increasing the "healthy" portion of the overall coverage pool), focused on managed care provision, leveraging an evidence based medicine (EBM)⁷ approach for continuous improvement in care delivery organizations and procedures. Central to this mission is the establishment of health coverage options for the uninsured either as individuals or by employers who currently do not offer health benefits through the establishment of Health Insurance Exchanges. A Health Insurance Exchange, or HIX, is a marketplace where those without affordable individual coverage or an existing employer-based healthcare program can explore options and secure insurance. And, although PPACA is a Federal law, given the nation's size and State differences such as the number of uninsured, poverty levels and other factors, it was determined that HIX program implementation should take place at the State level.

Guidelines for HIX implementation are not 100% solidified and there is some flexibility in how and by whom they should be implemented, exactly what functions they must perform and even how they can be funded but some of the key parameters are as follows:

- Establish either separately or in combination, healthcare insurance options directly for uninsured individuals through the American Health Benefit Exchange (AHBE) and for small businesses, the Small Business Health Options Program (SHOP) Exchange, via a portal-based environment backed by contact center support that markets an approved set of private health insurance providers, offering directly comparable insurance benefits packages, ranging from barebones and catastrophic policies to comprehensive coverage
- Single door eligibility determination to support triage of those below the new 133% FPL (Federal Poverty Level, or \$24,352 for a family of three and \$14,404 for an individual in

2010) threshold for admission into Medicaid and potential level of tax credits and direct subsidies for individuals and families earning between 133% and 400% FPL based on MAGI (Medicaid Adjusted Gross Income) for application and admission into private health insurance plans

- Ability to comparison shop between plans on the basis of cost, program benefits and overtime, quality ratings for the plans and insurers in order to spur competition, reduce overall rate premiums, and support State reviews of all premium rates provided
- A federally run HIX for States that want to opt out of developing or administering their own

Guidelines for the development of these State-level exchanges have not been constructed in a vacuum; indeed, two States with very different exchanges have served as baseline models, Massachusetts and Utah. Massachusetts uses a similar model to the PPACA guidelines of mandating coverage to drive the uninsured individual to the program and leverages existing State-run Medicaid programs and infrastructure to extend coverage whereas Utah has built a program targeting small businesses with employment rolls under 50 who would have previously not provided insurance or would have faced far higher premiums than they would have through a bundled marketplace. Furthermore, where Massachusetts has fully implemented their program Statewide, covering over 450,000 of the 650,000 people that could be covered in the state and reducing the percent of uncovered to the lowest state in the nation⁸, Utah's program, on the other hand, is really a pilot program now covering 114 small businesses with a total of 1035 employees as of May 2011.⁹ Aside from these two State-wide programs, other programs such as New York State's HealthPass (<http://healthpass.com/>) program.

The timeline for HIX development and deployment is relatively short – the law fully implements in 2014. To improve the chances of success, PPACA and associated Center for Medicare and Medicaid Services (CMS) programs and policies set the following development, deployment, and funding guidelines and support mechanisms in place:

- 2012 through 2015 funding support of 90% federal matching funds (through current Medicaid APD program planning mechanisms) for HIX platform functions and extensions of existing Medicaid platforms that support the gap between existing Medicaid FPL coverage and the new 133% mandated coverage
- 2011 grant awards for 100% funding of HIX development and deployment for a select handful of States (Oregon, Wisconsin, Kansas, and a regional team led by Vermont won) with an eye on development of very different architectures and functional operations that provide the other 46 States with reference choices
- CMS reference architecture guidelines for HIX design and development and milestone dates with clear entry and exit gate guidelines for successfully meeting these milestones
- Development of a set of consumable shared services such as income and citizenship verification to be provided by the Federal government to the State-level HIX

While the federal funds and architectural guidance will undoubtedly improve the chances of each State successfully deploying their HIX by 2014, the challenges are still daunting. One analysts firm, TripleTree, provides a very pessimistic estimate of initial year stand-up and operational costs across all States somewhere in the neighborhood of \$6B US with an additional \$2B in long-term support costs (the report asserts this will be passed back to the consumer as a premium surcharge)¹⁰. Many of the cost controls, consumer perceptions which will undoubtedly impact ultimate adoption rates and satisfaction levels, and the need to seamlessly handle churn between Medicaid and private insurance plans are intricately tied to how modern IT platforms are applied to policy implementation and process overhaul. Furthermore, the HIX front-end and data from Insurance providers that are part of the exchange must be tied to HIE back-end systems which, in turn are tied to healthcare providers, such that outcomes and analysis of them can be used as a set of actionable decisions to address the improvements in care delivery and demographic population health metrics.

This paper discusses how IT can be applied in HIX platforms starting with a gap analysis. It then moves on to references to other IT applications by Oracle in health and human services programs, and ends with a proposed reference architecture that integrates HIX back into the broader Health Reform initiative and directly addresses some of the social service side issues by proposing an integrated approach to HIX platform functionality, covering healthcare and social programs.

Health Insurance Exchange (HIX) Gap Analysis

A Fragmented and Archaic Status Quo

Implementation of PPACA at the State level offers flexibility to address the differences in population and program requirements at the State level but it also means potentially facing some of the same challenges other federally mandated, State implemented programs such as Medicaid face. As is the case with HIX guidelines, Medicaid, initially enacted in 1965 is a federally mandated and funded program implemented at the State level. One proposed advantage of State-level implementation is to deal with the complexity and variations between States, ranging from Vermont, a State with relatively little diversity or poverty, uninsured at roughly 10% or 59,000, and an overall population of less than 1 million, to States like Texas with a population of over 24 million, significant, entrenched poverty, and an uninsured population of over 6 million or 17% of the population.¹¹ Historically, these State-to-State demographic differences have resulted in Medicaid programs variations including:

- Population coverage/cut-off FPL thresholds and policy regarding coverage without legal resident or citizenship
- Coverage levels at different FPL thresholds in different States for four separate coverage types: individuals, pregnant women, children, families with children
- Levels of integration with State-wide Children's Health Insurance Programs (CHIP) and FPL thresholds for entry into CHIP
- Levels of integration – or, from the contrary point, extent of siloing - with social services programs such as Temporary Aid for Needy Families (TANF), Supplemental Nutritional Access Program (SNAP, formerly the Food Stamp program), and other supplemental assistance programs
- State-specific legislation largely around extensions to Medicaid, CHIP, and parallel State level healthcare programs and their resulting policies have driven different operational implementations from State to State
- Vastly different IT platforms, often termed Medicaid Management Information Systems (MMIS) platforms.

And, for many years, the population covered by Medicaid and the organizational mindset of many States around Medicaid have been very slow to change and it is often hard to tell which side - IT platforms or line-of-business organizational structures - are impeding progress the most. However, in recent years, Medicaid programs have not been static as many States have made significant improvements to the organizational structures and underlying IT systems to support them. The catalyst for this change has been perspective, namely, looking at outcomes first instead of absolute benefits dispensed.

It is common knowledge that there are direct links between low-income related to unemployment, lack of skills and education, poor nutrition and access to food, poor housing, and the lack of access to healthcare. And, over the past decade, many State-level programs are taking a more holistic approach to their government and non-profit programs assistance starting with integration to their eligibility assessment and entry points into what were formerly, completely siloed programs. In fact, one of the

States often touted as a forerunner to the PPACA, Massachusetts has shown remarkable results from development of integrated eligibility and intake across Medicaid, SNAP and TANF¹². What Massachusetts and many other States have learned is that program integration meant significant changes to their underlying IT systems and the cost and speed of change was inversely proportional to how modern and open the support IT systems are. The federal government also recognized that antiquated Medicaid IT systems are a problem and developed the Advanced Planning Document (APD) procedural guidelines for funding requests and the Medicaid Information Technology Architecture (MITA) to facilitate better implementation of supporting IT platforms underpinning those requests.

Even with the MITA roadmap and CMS funding, historical customization on proprietary platforms in support of very different policies and practices in each of the States and a limited set of contractors who have traditionally built and supported MMIS systems and transferred them from State to State, has hampered updates to the systems, encumbered the speed at which eligibility and payment changes required in State transfers, and have severely limited support for integrated eligibility and intake across multiple health and human services programs.

Change is Coming – and it will Keep Coming

The PPACA was signed into law on March 23, 2010, but that was of course only the starting point. State-level implementation while guided by the PPACA will, in many cases, require additional legislation at the State level. Many States have dispensed with this step, others quickly handled it, yet others are planning to handle legislative adjustments in 2012. There are also challenges to all or parts of the PPACA that are being brought up through both the federal and individual State courts regarding the constitutionality of the law which could lead to adjustments to the law or an outright repeal. Any of this could obviously impact HIX implementation plans.¹³

But, even if legislation and court challenges have zero impact on HIX implementation, existing policies in various States will certainly impact it. For example, studies show that income variations from year to year are actually the largest in the population segment targeted by the PPACA legislation¹⁴ in terms of uninsured coverage, between 66% and 400% of the FPL (the deeply impoverish and the upper middle class have the most stable income with the working poor and young people driving vast fluctuations in income for the HIX targeted range). These personal income variations are manifestations of:

- Deep changes to our economy, most notably, a growing services sector where fewer employers offer health benefits to employees with incomes in the HIX FPL targeted range
- Increasingly underemployed, temporary employment, and contractor based employment where insurance is not provided - again more likely to generate income fluctuations within the targeted HIX FPL range¹⁵¹⁶
- Mobility, not just from State to State, a trend seen since the 1950s but also from job to job, a trend increasingly seen since the 1990s
- Small business having a more difficult time offering health benefits as the cost for policies continue to raise may opt for removing themselves from the equation, allowing employees to go directly to the HIX market place on a State-by-State basis

- College students graduating or moving pass the age limits for coverage under household plans yet moving back home due to a lack of job prospects (PPACA addresses this partially by upping the age limit to 26 in the patient protection parts of the bill)

These factors will mean that there will be significant “churn” in the system, that is, individuals and families moving to and from Medicaid into the HIX private insurance market and to and from the HIX private insurance market into employer based programs. And unlike current Medicaid programs which handle – on average – an immobile, impoverished demographic population or Employer based programs that allow changes only at the point of hiring or, in general, once per annum, HIX populations could see multiple significant program enrollment and subsidy level changes (the level of subsidies provided to support monthly premiums) let alone the obvious similar changes to Medicaid and private insurance programs such as additional family members, change of address, etc. Even the income calculations would have to be matched; Medicaid uses a gross income model (MAGI) and burdensome face-to-face identity verification process for income and identity whereas HIX plans are for use of standard IRS income Statements and online verification of income and identity. In fact, in many ways, the intent of the programs would also need to be matched (or at least considered); yet, in most States, Medicaid rules are intended to reduce the number covered not increase it - the very opposite intent of the PPACA's framers.

This churn would not only happen within a State but between States (though a countering trend of reduced interstate migration due to the housing debacle is reducing this fluctuation) and it would be much more of an issue to automatically track prior enrollment in another State HIX and retrieve the information when a consumer wants to enroll in a new State – both to avoid fraud and errors but also to improve the customer experience by automatically populating most application fields with the prior State's HIX information. The ability to standardize the baseline fields of information shared and the protocol for sharing that information (security, transport, process, etc.) would be a major issue to consider.

As mentioned above, many of the States are considering an approach of simply extending their Medicaid programs and or leveraging the underlying MMIS systems and simply erecting a thin veneer up front in the form of a customer portal for the health insurance marketplace. But, along the same lines as the health and human services program eligibility and intake challenges, disbursement of subsidies to HIX private insurance program enrollees in the 133% to 400% range and small business tax credits from the same platform as reimbursements to medical providers on the MMIS platform will also be difficult when legacy transfer systems are taken into consideration. In many cases, different States may decide that the federal funds to support subsidies should be funded from different programs than Medicaid, creating a “color” of money issue within a State and an IT problem when platforms are “shared” or transferred between States – even more difficult if that platform is a closed proprietary legacy platform.

Enabling HIX Visibility, Information Sharing and Support for Health and Human Services

Healthcare practitioners, social services case workers, educators, and even community policing experts who deal with everything from “uncompensated care pools” in emergency rooms to child abuse and

malnourishment will tell you that the situations they encounter have multivariate causality. Their hunches and anecdotal experience is borne out in academic research studies developed over multiple years, often correlating a particular set of factors that match lack of education and probability of entry into the criminal justice system or inadequate housing and lack of healthcare or any other number of strands within the web of poverty. But, not unlike the conclusions reached after 9/11 in the intelligence community (IC), specifically that organizational, legal and IT barriers prevented information sharing and integrated processes across the multiple IC agencies at the international, national, State and local levels. Similarly there “need to share” within the health and human services community at the various levels of government.

Between stimulus funds for Health Information Exchanges, PPACA Health Reform legislation and the 90/10 Federal Funding (FF)/(Self-Funding) SF model between now and 2014 driving significant funding and deployment deadlines, a similar call to action as that of the post-9/11 IC world – at least from an IT perspective – is now laid before the States and its supporting vendor community. On the one hand, vendors may see HIX projects as an opportunity to carve out a new niche revenue stream convincing States to develop only a limited portal environment to triage Medicaid enrollees and placement of the remaining targeted FPL applicants over to private insurers or to retain their existing influence and revenue streams by pushing States to simply adopt extensions to their Medicaid systems in support of HIX platform requirements. On the other hand, vendors who are not the incumbent State-level Medicaid platform or are actively working on Integrated Eligibility and Intake platforms for programs on the human services side may advise the States to take a more open platform and shared services approach to HIX platform design and deployment. Whose right, both, a combination, neither?

States will need to carefully take into consideration their overall health and social safety net goals, the fact that this IT funding windfall is short term – what will the platform cost be long term - and yet never lose track of the fact that the clock is ticking! Fortunately, many of the gaps and challenges with the existing platforms provide clear pointers as to what course of action makes the most sense. Some notable points to consider include:

- HIX guidelines, deadlines and enrollment influx will increase scrutiny on Medicaid Modernization projects
- Enrollment increases cannot lead to increased improper payments and fraud (provider and program enrollee) currently seen in existing Medicaid program rolls
- The opportunity to build in economies of scale can only happen through an *open and integratable* COTS platform
- The need to share information between multiple vertical government organizations, spanning tax agencies, criminal justice, educational institutions and of course public and private healthcare payers and providers – all of which have their own proprietary and legacy systems
- A different set of optics for program success than for Medicaid from the constituents it serves, the scrutiny by stakeholders on results and patience to wait for them to be delivered

Turning HIX Gap Analysis into IT Requirements

CMS has provided guidance to States and their vendors for design, development, and implementation HIX inclusive of coverage expansions and improvements to existing State-run Medicaid and CHIP Programs. The CMS guidance document provides the business and technical architectures, governance, and cost allocation guidelines for an IT platform that provides simple and seamless eligibility and enrollment for coverage through the Exchange inclusive of tax credits, cost-sharing reductions, Medicaid, and CHIP.¹⁷ Additionally, the ONCHIT, developed more comprehensive recommendations inclusive of not only the healthcare programs in the CMS guidance but also the common State-wide human services programs such as SNAP and TANF.¹⁸ This set of recommendations focuses on the information sharing and management protocols, security, privacy and business rules necessary to extend the HIX platform coverage across all major health and human services platforms.

While these guidelines provide a very detailed scope of expected functionality, to ensure the States have flexibility and to remain vendor neutral, actual platform requirements and components specifications, how functionality will be delivered, and how specifically to deliver it are not provided. In this section we look at key areas of the HIX's IT platform as they relate to the functional scope outlined in these two documents.

Turning Many Doors into a Single Comprehensive Door

The consumer-centric approach envisioned by the PPACA legislation strives to deliver a single door into the health and human services safety net. But what does a single door really mean? Currently, there are several doors into the safety net, most of them separate and, where they are integrated, it is generally with the goal of determining how to move long-term indigents off the social welfare rolls by understanding the current siloed program outcomes and building a more holistic approach. This is certainly the case with TANF, SNAP, Medicaid, CHIP and child welfare programs. However, the single comprehensive door of a fully integrated HIX system must consider the following:

- Integrated health and social safety net programs outcomes for populations only temporarily involved with the social safety net in *addition* to those intended in current Medicaid/CHIP/TANF/SNAP integrated eligibility and intake programs
- The single door cannot lead to a maze of rooms or to a perpetual waiting room. Placing a thin veneer over existing silos without integrated process orchestration across these departmental silos by leveraging a shared and accurate set of information about the consumer coming through the door will be essential
- The possibility that there will be a difference in the expectations of the population served above 100% FPL as to what constitutes a consumer-centric approach in the age of the internet and mobile devices (not to mention those below 26 who are poor but tech savvy). The current public health and human services programs, including Medicaid and Medicare serve a population on the other side of the digital divide.

With these qualifications on what a single-door is and what it needs to do, many States are being careful how and when they leverage their existing Medicaid systems. A recent report by the National Academy for States Health Policy Stated:

"States have the lion's share of responsibility for implementing ACA, but there are critical gaps between where States are today and ACA's enrollment superhighway vision for 2014. Many current Medicaid and CHIP enrollment systems are complex and difficult for consumers to use, and include stigmatizing rules and require burdensome documentation to prove eligibility. Eligibility systems are decades-old and difficult to manage. Organizational structures are siloed and disconnected."

Paving an Enrollment Superhighway: Bridging State Gaps between Now and 2014, Alice M. Weiss and Laura Grossman, March 2011

To handle the extended scope of a comprehensive single-door platform, Oracle makes the following recommendations with regards to the platform:

- Fully modernized web-based, social network capable, transaction-oriented platform capable of handling both existing Medicaid and CHIP as well as coverage extensions and the new private health insurance exchange population
- Embedded platform intelligent automation to support the eligibility and enrollment process for all coverage groups from start to finish as a self-guided set of interviews to determine eligibility through the financial transactions associated with enrollment
- Embedded platform analytics to support front-end consumer comparison shopping across private health insurance options as outlined in the PPACA but also the security and privacy support to enable demographic information to provide consumers with comparative information such as "others with diabetes have selected plan A over plans B and C" and the social network access to anonymously discuss why from a diabetic's perspective
- Integrated case management and knowledge management to support single application instances and automated renewal process, single entry of any new data, and ability to seamlessly transition back-and-forth between all means of access: on-line, through a call center, or in person
- Reliability and scalability to handle peak start-up and annual renewals as well as churn between programs and with respect to monthly changes/disbursements of subsidy/tax credit ratios for HIX private insurance coverage
- Additional capabilities that are critical to modern customer-centric platforms such as built-in analytics to support continuous improvement in call center metrics, online self-service payment engine, and support for marketing campaigns to attract individuals and businesses in the HIX target population marketplace

Centralized and Integrated Screening & Eligibility

There is potential for a reasonable yet common misconception to develop with respect to the comprehensive single-door namely, all a State will need is a portal and a content management system that can be used by consumers and program enrollees as well as my call center agents. The problem with this scenario is that citizens and call center agents are not knowledgeable enough to handle the complexities of screening and eligibility without guidance and, for multiple programs even program

administrators and case workers are not necessarily up-to-speed on the details across multiple programs. The ability to handle multiple populations and significant changes to how screening is performed and eligibility is determined will be critical to the success of the State level HIX. Here again, the analysis of Medicaid and CHIP enrollment and eligibility system readiness are in question:

"A number of States made program improvements such as offering applications that can be submitted online. Despite this early work, the survey findings highlight that States have a long way to go to develop the integrated, technology-driven, web-based eligibility systems for Medicaid, CHIP, and subsidized Exchange coverage that are envisioned and required under reform. For example, all States, including DC, post their Medicaid applications."

Kaiser Commission on Medicaid and the Uninsured, January 2011

The report goes on to further describe the shortcomings of the "online" Medicaid applications which exhibit first generation e-government characteristics such as print-out-and-fill-out only capabilities in over half the States and lack of transactional capabilities or online identification verification in the vast majority of States. Some of the key shortcomings in the Medicaid systems with respect to eligibility determination include:

- Paper-based and face-to-face office entry of critical data places the burden of screening and eligibility knowledge on individual case workers or, worse that of the program prospect
- Inability to deal with different eligibility status for different family members
- Supporting documentation such as income and identity verification cannot be handled on-line but, instead have mail-in or in-person constraints
- Rules are often hard coded into systems such that changes to FPL thresholds or other guidelines must be reprogrammed, in many cases within legacy systems in an antiquated programming language such as COBOL

These shortcomings will be further exacerbated by the requirement to change and streamline eligibility under the PPACA yet deal with what may be more complicated tax credits and direct subsidies for individuals, families and small businesses in real-time. As a result, even though funding will be available to extend Medicaid and CHIP systems to support expanded FPL coverage, in many cases the most expedient way to do this is to decouple and replace hand-coded rules with policy automation and processing that is external to the legacy MMIS platform.

Streamlining and Automation of Policy and Process

As was pointed out in the last two sections, a 24x7 consumer-centric eligibility, enrollment, and support environment that can handle variations from State to State if many of the same components are used across multiple State will make efforts to streamline policy automation a make or break part of the HIX platform. When selecting a policy and process automation platform the following critical points need to be considered:

- Can the screening guidelines be extracted from and eligibility rules quickly automated directly from the original policy document – even if the policy and planning documents are quite complex?
- Can this be done in English or does it require programmatic code?

- How quickly can you adjust the screening guidelines in your self-service interview to reflect changes in tax codes, thresholds for subsidies versus credits or any other events? Can you perform these changes directly from an excel spreadsheet and update them, again without code?
- Do you have to code your self-service interview or will it be automatically generated and embedded in your existing eligibility and screening portal?
- Can you embed your policy automation directly into your case management system so that the same guidelines are used across your consumers in the self-service mode, your call center agents in an agent assisted mode, and even your case workers in face-to-face or off-line asynchronous mode?

These questions address the core concerns of dealing with very different eligibility criteria for very different programs and being able to quickly adjust if changes are made to the policies and guidelines for anyone of the programs without taking the system offline or shutting down parts of it. They also touch on a critical issue, consistency and transparency, too often different case workers or different local government implementations will provide different guidance leading to very uneven and inconsistent outcomes. Part of the problem is the knowledge level and training of the case workers but part of it is that they are making their decisions based on different and often inconsistent interpretations of State- and Federal-level policies and incorrect data.

Building the Golden Record and Sharing It

In most States, program enrollee and State citizen records are fragmented often with very different data models and there isn't an impetus to "share". And, where information is exchanged it is done through point-to-point integrations and non-standard transformations from one data format for example, CHIP for one side and the juvenile justice system on the other. The results are inaccurate individual records frequently incomplete and out of date and/or inconsistent with each other. Yet, development of a single record of truth will be essential to supporting a single door and auto-population of applications and renewal of existing program membership. CMS is partially addressing this issue of master data management, the development of a "Golden Record" from the data interoperability perspective through advocating NIEM, the National Information Exchange Model – and Oracle agrees that this is an essential part of the solution and have worked with local, State and Federal agencies on NIEM implementations. However, in order to develop a Golden Record and share the information in that record with various consumers and stakeholders the following overarching criteria must be considered:

- Ability to clean and synchronize eligibility and screening data across the exiting program entries for example, if the applicant was formerly in Medicaid or drew unemployment insurance, many of the fields in their HIX-based insurance interviews and application or renewal touch point shows current and consistent information to minimize data re-entry
- Ability to define the data model in a proven, cross-program, comprehensive and flexible constituent data model that can capture all relevant profile information, including all related program memberships and interactions, addresses, contact points and relationships

- The ability to federate data from all source systems, i.e. virtually aggregate information from multiple sources into a single view, leaving the data at the source to avoid data redundancy and minimize data stewardship turf wars
- Ability to granularly access and authorize use of parts of an aggregated record in accordance with HIPAA and other program-specific privacy and security guidelines based on role and other multi-variable dependent guidelines

Error and Fraud Detection and Management

As previously Stated, Medicaid has strict identity and income verification processes yet it still experiences several billion in over- and underpayments and identity and provider fraud losses annually. As a result, it is unsurprising that only 8 of 50 States have any waiver for mail-in or in-person identity verification. However, for the State HIX concept to work in a consumer-centric fashion, online, real-time identity and income verification are essential. While the HIX would not be the key platform for monitoring healthcare insurance fraud as it is not responsible for dealing with provider reimbursements there are still several IT considerations including:

- Provision of an identity and access management (IAM) platform that works with the HIX portal, your consolidated case management analytics, your policy automation engine, and golden record systems to authenticate consumers, program enrollees, 3rd party providers, and case workers and program administrators
- Ensure that your IAM platform is interoperable with all major directories, databases, application servers, operating systems and other potential components of any backend siloed systems that will need to confirm identity prior to delivering your HIX and the consumer its data
- In combination with the prior point, make sure your IAM platform supports all major industry standards so that it can leverage planned external citizenship and income verification services form CMS or directly from DHS and the IRS
- Use your case management analytics in combination with your policy automation engine and the golden record and activity monitoring to look for potential errors and fraud

Building a Modern HIX Platform

Functional Reference Architecture

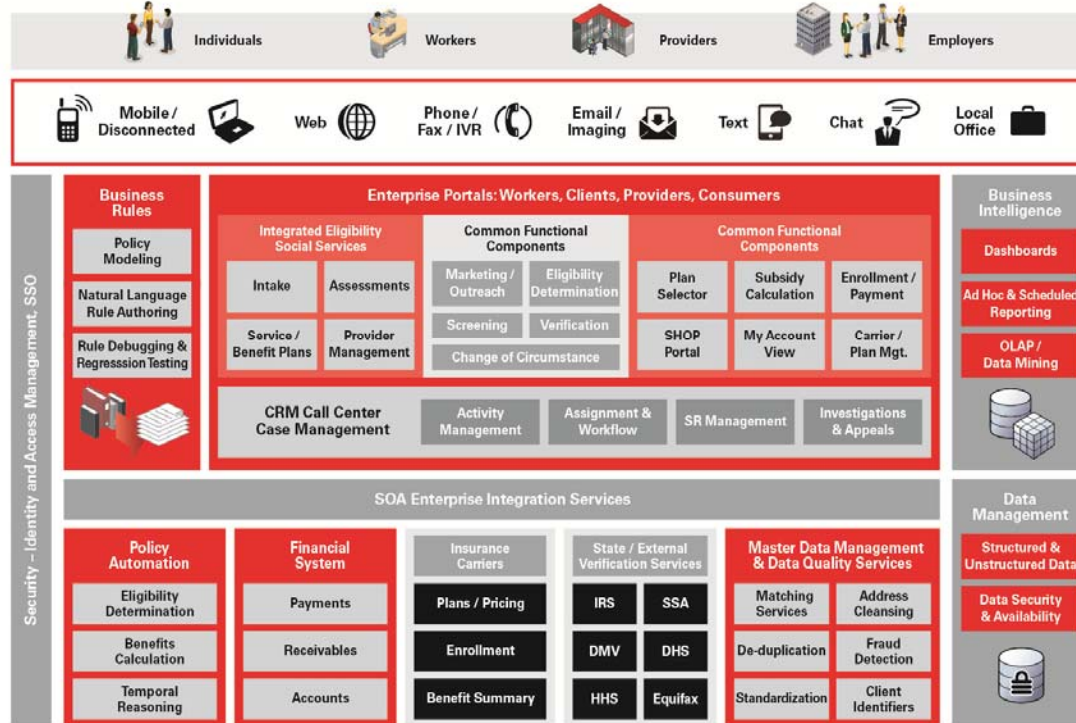


Figure 1. Comprehensive Single-Door Health Insurance Exchange Reference Architecture

Oracle's Modern HIX reference architecture can be implemented as best-practices-based "three-tier" platform. The top-level, the HIX Consumer Tier, consists of a user-friendly front-end portal (Oracle WebCenter Suite) and Siebel case management system with strong identity management, enterprise – meaning secure - social networking and other personalization capabilities. This platform delivers a fully commercial retail look-and-feel, transactional capabilities, and data persistence to prospective program enrollees, similar to what you'd expect from Amazon.com or Verizon. Just below the HIX Consumer tier is the Business Processes and Exchange Services Tier, responsible for HIX policy and process automation and implementation of web and HIX platform application services integration. Below this tier, the Backend Services and Data Management Tier handles, supporting ERP services and shared services both within the platform or potentially consumed from external sources (for example with identity and income verification potentially provided to the States from the Federal government). These three tiers are implemented as a combination of COTS open platform software *configured* to deliver HIX related services such as:

- Custom configured intake and screening processes leveraging Oracle Policy Automation, Business Process Management and SOA-based Web services to connect with outside verification and information sources with relatively little if any programmatic code additions

- Benefit eligibility determination processes leveraging our Oracle Policy Automation to support both complex qualification decisions and guidance to program prospects
- Insurance plan selection processes – based on prior intake and eligibility decisions and comparative pricing and plan quality (comparisons would be built up over time based on empirical data through use of analytics)
- Member enrollment and case management processes using the latest prospect or program enrollee data through a combination of the case management and master data management system
- Accounts Receivable (AR) processes for any money received by the State insurance exchange as a SHOP intermediary, premium adjustments, or other special programs
- Accounts Payable (AP) processes for:
 - Payments by the State exchange for special programs or adjustments
 - Aggregated premium remittance to insurance carriers.
- Fraud, waste, and abuse detection processes that analyze collections of transaction streams over time; this subsystem leverages Oracle's Complex Event Processor, Data Integrator, Master Data Management and Business Intelligence products to implement a State-of-the-art error and fraud detection and response solution.

The three tiers are designed as scalable modules, independently implementable with respect to each other so that each State can determine how much of their existing investments can be used as well as supporting a phased implementation and testing. We will now describe each major subsystem within each of the tiers – starting from the top and moving down from the HIX Consumer Tier into the Business and Data-access tiers.

HIX Consumer Tier

One of the HIX goals is to provide citizens simplified information on options for health insurance and how eligibility is determined. The portal interface will allow ease of navigational guidance through informational screens prior to all uses and decisions, registered or not. As an option, the Oracle solution offers an anonymous “pre-screen” which helps to guide the citizen even before the official intake and registration process begins. This option encourages use of the insurance exchange by giving the citizen a level of comfort and realistic expectation regarding their levels of benefits and any cost accrued or tax credits and subsidies provided.

Once the intake process begins, the citizen will register and create an account on the system which will be able to process and store information securely.

When users initially register into the system, the Oracle solution leverages Oracle's Identity Management to automate the provisioning of users and their respective role-based privileges into the backend applications and resources. Anticipated roles within the HIX portal are:

- Citizens looking for or renewing individual healthcare coverage and or membership in State-wide Health and Human Services programs (Medicaid, CHIP, TANF, SNAP, or potentially unemployment insurance)
- Case manager and government programs administrators
- Small business owner
- Insurance carrier

Users who have an account will enter into the system via a browser-based user interface – specifically logging into a web portal whereby users are presented with a highly user-friendly and intuitive interface. When users log into the portal, they will actually be authenticating themselves into the Oracle Access Management Suite (OAMS). OAMS provides single-sign-on across disparate websites (internal or external), fraud detection, and stronger authentication than simple username/password. For example, it provides mechanisms such as personal identification numbers, tokens, and encoded images for ensuring that both parties are who they claim to be.

Once users are authenticated, the available exchange services will be offered via a top menu-bar, and in addition, there will be a left-hand side menu bar providing goal-based menu options.

Business services will be surfaced as task-based page-flows within the portal. Users will initially be categorized based on role and goal – leveraging their menu choices and registration information, as well as intake screening information.

The following is an example of some of the services offered and visible to the different use roles:

- Citizens will have services related to information intake and eligibility verification, plan search, sort and review, premium benefits determination, enrollment and, in some cases, premium payment processes and monthly and annual plan Statements
- Small Business Owners will have options to select specific employee offerings, pre-enroll their employees, select co-payment rules, and verify and download information on plans/premiums selected by their employees
- Insurance carriers will have ability to self administer their plan offerings as well as adjust the rules for those plans
- Case Workers will have the ability to review cases for pending Medicaid applications and non-standard verification for Insurance eligibility verification as well as the ability to change circumstance information, administer changes in plans, etc. Likely, multiple kinds of case worker will require separate roles, depending on State requirements.

Though the various business services will vary by role, they will all be processed in a similar fashion. The portal will invoke exchange services via SOA-based web architecture, implementable with Oracle Fusion Middleware products. Any transactional data will be encrypted via WS-Security (as well as transport-level encryption via TLS). Please refer to the next section for a characterization of these business web services.

Business Processes and Exchange Services Tier

The Business Processes and Exchange Services Tier or middle-tier, business-oriented services, represents a collection of business processes and coarse-grained web services that implement the various exchange services. Many of these services are part of existing COTS products already developed as part of Oracle applications, like Siebel CRM and Call Center, Oracle Financials, and Oracle Policy Automation, surfaced (exposed) as standard WS-I compliant web services. They may represent a coarse-grained business function such as UpdateCitizenInformation, or alternatively, they may expose a business process such as eligibility determination.

Regardless, these services will invoke standard security services such as fine-grained authorization (based on role, request context, function being requested, etc.) as well as auditing. Note that HIPAA and other required privacy constraints and audit data will be centralized into the Oracle database via the Oracle Audit Vault product (part of the Backend Services and Data Management Tier). The system also will leverage “security as a service” to simplify deployment, encourage re-use, and reduce development costs.

These business services then invoke other subordinate exchange functions and backend services. Examples are verification services, security services, and ERP services. NIEM-conformant messages will be used whenever the insurance exchange needs to send or receive messages to an external service/application – as recommended by ONCHIT, CCIIO and other policy-makers. Oracle’s solution can support existing NIEM exchange packages (IEPDs), as well as the development of customized extension schemas or completely new NIEM message schemas. Please also note that NIEM is a major focus area for Oracle and we have a highly experienced team dedicated to expanding the usage of NIEM in the industry, as well as contributing significantly to the ongoing evolution of NIEM as a robust government data sharing and interoperability standard.

In addition to invoking backend services, the middle-tier services will invoke the business rules engine such that rules are never hard-coded into the system, can be extracted by business and program administrator types directly from policy documents and legislation, and can easily be updated. Oracle’s rules engine is called Oracle Policy Automation, and it exposes any rule set as a web service that is easily accessible (callable) by any other component of the system. Oracle’s policy automation solution allows the exchange to service citizens and clients fairly, efficiently, and consistently while maintaining full compliance with laws and regulations. Our rules engine separates rules from the engine. It has a complete natural language (English, Spanish, Chinese, etc. – not C, JAVA, etc.) rule-authoring environment, fully integrated with Microsoft Office (Word or Excel), allowing changes in rules definition to be authored by a business user (e.g. State policy person, insurance carrier policy specialist) rather than an engineer. These rules are open and can be shared and re-used by other entities if desired. OPA can be used for complex health insurance (or multiple, cross program) eligibility determination, rebate and premium calculations and plan matching and is exposable as a web-service. Built for service-oriented architectures (SOAs), Oracle Policy Automation also includes guided interactive questionnaire capabilities which will help guide the citizen through the process and prevent redundant, contradictory, and irrelevant questions from being asked as it leverages Oracle Master Data Management.

Many business processes and coarse-grained services are actually implemented as a series of discrete steps that are orchestrated using industry-standard notation called BPMN (Business Process Management Notation) or BPEL (Business Process Execution Language). Oracle fully supports both of these and allows them to be leveraged together in any SOA-based solution. BPMN is best used for implementing true business processes that incorporate human workflow, whereas BPEL is best used for implementing a sequence of steps in straight-through, machine-to-machine, processing scenarios. This was previously done at a programmatic level in Java (for example in something like WebLogic Integration Server) or C/C++. There is also overlap among these use-cases, and as a result, Oracle allows the designer to make their own choice. Finally, the business services tier, as a best practice, includes batch processes (orchestrated using BPEL to manage the batch process runs) to implement certain exchange tasks that are best performed intermittently or at a fixed periodicity yet do not depend on human intervention.

Oracle's solution includes out of the box functionality to perform Intake, Assessment, Referrals, Appeals Management, Investigations, Eligibility Determination and ongoing Case Management services. These services have the ability to capture the information needed to serve customers and to securely share program prospect and enrollee information with various constituents in compliance with agency privacy policies. All information related to a case is documented and shown in a single location, empowering caseworkers to analyze the case history, and collaborate with other departments/insurance carriers.

Oracle's case management offers a complete integrated data model containing case, customer, and eligibility, plan selection, and change-in-circumstance information. It provides pre-built guided business processes that can be modified, created and maintained. These CRM case management services have been developed over the last 10+ years to improve operational efficiency with an easy to use, widely accepted interface.

Backend Services and Data Management Tier

It is assumed that the vast majority of readers for this white paper are business-oriented or line-of-business and policy implementers and therefore this section has been abbreviated. Please visit Oracle.com for an extensive set of technical white papers on each aspect of this tier and the subsequent section on infrastructure platforms. The data access and management tier consists of the following types backend services;

- Identity services – typically exposed as LDAP. However, Oracle's Virtual Directory product supports exposing most any source of identity data (within multiple disparate types of data stores) as either a single LDAP or Web Service interface
- Authorization service based on XACML standard
- Auditing service based on MITA TAC recommendations
- Accounts Receivables (AR) and Accounts Payable (AP) services – exposed from the ERP system
- External backend services – exposed as either web services other protocol/message-passing interfaces such as:

- Medicaid Eligibility (e.g. 270/271-type member eligibility)
- Income verification
- Credit verification
- Criminal background checks
- Driver's license status
- Custom database tables to support many of the business processes described in the *System Overview* section above.
- CRM case and account management

In addition, the data that is persisted as a result of these services/transactions will be encrypted within the database using Oracle's *transparent data encryption* option. Finally, Oracle strongly encourages health and human services organizations to leverage additional security features of the database that seamlessly integrate best practices such as DBA-provisioning and segregation of duties into the datacenter operations.

Exa' Shared Services Infrastructure

The most efficient and rapid way to stand-up the three tiered model's software components above is through use of pre-integrated, preconfigured platforms such as Exadata and ExaLogic which remove much of the initial rudimentary but potentially expensive and time consuming upfront integration processes that will be necessary to stand up a HIX platform without getting mired in legacy systems extensions or risking costly program delays and missing funding windows. Furthermore, Exadata and ExaLogic are designed to be completely scalable from very small systems running COTS software to extremely large systems. This will be a critical concern when States look to leverage reference architectures from large States to smaller States or vice versa. Exadata and ExaLogic are the fundamental building blocks of both Public and Private Cloud environments for Public Sector.¹⁹

Oracle's Best Practice Recommendations for HIX Implementations

Oracle's Work with Early Adopters

Oracle has participated in two of the four early innovator grants projects granted last February but since neither has reached completion we are not in a position to describe the details of the projects. However, Oracle's support of other projects with similar functional requirements and platform components provides us with a vast repository of knowledge and experience to support HIX best practice recommendations.

Lessons from the Non-Profit Insurance Market

Oracle has been working with commercial and non-profit health insurance policy providers for many years. We've worked with large commercial health insurance payers including United Healthcare in areas ranging from underwriter analysis to B2B and B2C sales campaigns and ERP support packages.

But what may be more applicable to discuss is our work with non-profit health insurers as they have implemented functionality similar to what will be needed for HIX platforms.

For example, the largest non-profit health insurance provider in the United States is the Blue Cross and Blue Shield Association (BCBS) which operates independent non-profit entities at the State level. One of the largest BCBS State-level operators, **Blue Shield of California** (BSC), has 3.4 million members and is one of the largest provider networks in the country. In 2010, BSC moved to a combined call center and self-service platform for monthly premium payments on Oracle and saw a rapid shift to on-line payments instead of by mail or through the call center such that by mid-2010, more than 84,000 premium payments processed electronically each month, totaling more than \$25 million payments monthly. At the same time, they found that the on-line system freed their call center agents to handle more complex issues. **BlueCross BlueShield of North Carolina**(BCBSNC), with a membership of 3.7 million, also moved to Oracle, specifically Siebel CRM and Siebel Call Center in 2009 to provide a unified solution for managing customer interactions and to ensure a consistent experience across communication channels. BCBSNC have had exceptional results; in particular they:

- Developed a “Buy Online” tool based on Siebel to provide potential customers with an instant rate quote and then allow them to purchase insurance online
- Achieved a 96 % participation rate in the online option for insurance purchase
- Accelerated the processing of both paper and online applications and reduced paper use and, subsequently, costs
- Leveraged Siebel Call Center to provide one desktop reference point for 80% of the information call center agents need to answer members’ questions, reducing the number of applications they must consult from 12 or more to just 3

Another non-profit insurance provider **Harvard Pilgrim Health Care** (HPHC), Inc. is a full-service health benefits company serving members throughout Massachusetts, New Hampshire, and Maine. HPHC offers a wide variety of health insurance options for companies, families, and individuals. The organization’s fully-insured or self-insured preferred provider organization (PPO), point-of-sale (POS), and health maintenance organization (HMO) plans are available with multiple variations tailored to the needs of its members and their employers. Similar to the two Blue Shield examples above, HPHC has implemented Oracle CRM, Master Data Management and is now implementing Oracle Policy Automation to support integrated call center and online self-service for plan purchase and management across their various customer groups. However, additionally, HPHC is using their platform to support recruitment and to better analyze and improve service levels in a heavily competitive market (HPHC has been ranked as one of the best Healthcare plans in the country multiple times). Furthermore, HPHC also provides financial feedback to its healthcare providers. This functionality supports:

- Eliminated time consuming data re-entry into ledgers and line-by-line reconciliation—accelerating close periods and reporting, and reducing the amount of administration time required
- Reduced monthly financial close cycle by 30 days and extended visibility into the company’s financial position

- Provided the ability to quickly consolidate and compare data between the company's general and provider ledgers, and reconcile the information to ensure that all data is accurate
- And, most importantly, enabled the organization to quickly provide detailed reimbursement reports to healthcare providers, which helped to restore the confidence of the provider community

Approaches to Integrated Health and Human Services Programs from around the World

Oracle is involved in all aspects of public health and social services programs administration and commercial and public healthcare provision in several countries around the world. Some of our more innovative (and publicly releasable) references of Social Services program administration applicable to HIX programs are provided in the sub-sections below.

Intelligent and Integrated Social Services Programs

In Spain, Oracle's Siebel Public Sector Case Management is being used by the **Institute for Social Services for Elderly and Dependent (IMSERSO)**, a public agency within the Spanish Ministry of Health, Social Policy, and Equality to provide a single platform for integrated health and human services to the elderly in response to recent national legislation, the Law for Dependent People. The law recognizes the right of citizen dependents (elderly and disabled) to receive government aid. IMSERSO introduced the system for autonomy and care for dependent people (SAAD) to enable regional governments to manage their internal processes related to the law (similar to HIX implementation at the State level). For IMSERSO to quickly comply with The Law for Dependent People in 17 autonomous regions it had to implement an open IT system to allow easy integration with other bodies, such as municipal and regional governments. IMSERSO implemented a complete case management solution to support the execution of the law, such as evaluating dependent statuses, confirming rights to receive benefits, configuring citizen services, calculating grants, and determining follow-up actions.

IMSERSO worked with Oracle Consulting and Oracle's Partner, Accenture to implement Oracle's Siebel applications in just six months, enabling IMSERSO to manage processes in accordance with The Law for Dependent People including the following features:

- Mobile access for claim evaluators based on a eligibility definition of more than 150 indicators used to determine dependent status
- Creation of a single profile for each dependent person with dynamic management of the catalog of services and their costs linked to that profile
- Enabled 2,000 mobile evaluation agents—equipped with tablet PCs—to manage more than 380,000 SAAD cases in one year
- Enabled regional governments to incorporate their specific requirements and integrate their management systems
- Enabled 3,000 users to manage almost 1.3 million cases for more than 2 million citizens

- Improved process efficiency with visibility into case flows, service quality, and other metrics accessible through dashboards

Another example where a holistic approach has been adopted is that of the Dutch programs for unemployment insurance, the **Uitvoeringsorgaan Werknemersverzekeringen (UWV)**, and job training and economic development, Centrum voor Werk en Inkomen or center for work and income, formerly separate programs but integrated together as UWV Work. UWV Work, a gatekeeper to social services and a trusted advisor for people seeking employment, matches jobseekers with prospective employers, distributes work permits, and helps its customers apply for unemployment or other benefits through UWV's benefit payments division. It serves approximately 750,000 citizens a year through more than 130 offices. UWV manages the administration of employee insurance benefits, including providing temporary income when it is impossible for citizens to work. It delivers benefits to more than 480,000 citizens each year. In addition, more than 1,200 reintegration coaches at UWV Work help job seekers gain the skills they need to secure employment.

UWV Work is focused on work before income, that is, integrated outcomes. Its first priority is to help citizens find work before relying on unemployment benefits. It is imperative for UWV Work to manage user information and efficiently route and share it with potential employers and other partners. In 2003, the agency determined that its legacy customer management system could no longer support its goals because it did not extend to partners, required the use of slow and inefficient manual processes, and was increasingly costly to upgrade and maintain. After evaluating several options, the agency selected and deployed Oracle's Siebel Public Sector Case Management to create a new system called SONAR (as you will see in the proceeding sub-sections, this is but one part of a larger Oracle architecture implemented by UWV Work).

SONAR creates a simple and intelligent workflow between all partners in the work and income chain, replacing manual processes with electronic ones and enabling the agency to ensure a customer focus. It delivers a single, up-to-date and accurate customer record across the work and income chain—a key to prompt, effective, and personalized service.

For example, UWV Work deployed Siebel SmartScript to replace a paper-based process of gathering job seeker information. UWV Work advisors, working in 130 branch offices, interview job seekers to gather information about their employment needs and skills. Recently, UWV Work has added Oracle Policy Automation to its platform to accelerate operational changes and simplify navigation through program policies for its social services program enrollees (directly as guided self-service interviews) and case officers (to ensure uniform and correct guidance across various case worker skill ranges).

Managing Large Scale Financials

UWV requires a robust and reliable financial infrastructure to efficiently and accurately compile reports, annual accounts, and annual financial Statements. UWV has two instances of PeopleSoft Enterprise Financial Management—one for administration, managing about US\$3 billion (€2 billion); and one for the US\$29.6 billion (€22 billion) of funds used to pay unemployment and disability benefits annually.

Another, larger and closer-to-home example of large social services program's financials management is the US Social Security Administration. SSA, an independent agency of the United States Federal government that administers a social insurance program consisting of retirement, disability, and survivors' benefits and the US\$2.5 trillion trust fund managed by the agency. The agency operates in 10 regional offices, 7 processing centers, nearly 1,300 field offices, and 35 tele-service centers. SSA worked with Oracle Consulting to upgrade the social security online accounting and reporting system (SSOARS) to Oracle E-Business Suite Release 12 to simplify subledger accounting processes and improve data integrity, eliminate the need to re-enter data into subledgers thereby eliminating errors and improving productivity, and ensuring compliance with OMB's financial management lines of business policies due to the common accounting codes, configurations, and standard processes inherent in Oracle US Federal Financials.

In other cases, we've worked with social services agencies that are unable to move to COTS platforms and have performed web services encapsulation around them using Tuxedo (a platform that provides SOA Web Services application infrastructure connectivity and ability to transfer legacy code to modern virtualized hardware and operating environments). Case in point has been our work in France and also in Sweden.

Building Analytical Approaches Based on Data Driven Models

For HIX platforms to support seemingly conflicting goals of reduced cost and increases in coverage, States will need to harvest information from case management records. This will require embedded analytics capabilities in the case management systems but also the ability to collect data from disparate sources including the external private insurers, analyze it and create reports in real time. Oracle has several customers in health and human services programs around the world that are doing this today.

UWV Work, referenced above, uses Oracle Business Intelligence to gain insight into the success of its programs. Initial findings show that approximately 35% of job matches generated with SONAR lead to employment, compared to a 20% percent success rate with matches performed through a separate Web channel. In the future, UWV plans to further optimize data from the Siebel Case Management system by deploying additional Oracle Business Intelligence to provide detailed analytics and user-specific dashboards that provide data on call center productivity and case management trends across various demographics.

In another example, the **Barnens Ratt I Samhallet**, or BRIS, an independent non-profit agency that advocates children's rights in Sweden provides recommendations to government agencies responsible for child welfare. BRIS does this through children welfare case file collection and analysis using Oracle's Business Intelligence products. In other cases, we have customers who are performing their programs evaluation across multiple programs. The National Council for Evaluation of Social Development Policy (**CONEVAL**) is coordinated by **Mexico's Department of Social Development**. It is responsible for measuring, evaluating, and monitoring the impact of all federal social assistance programs. Each year, it evaluates 170 federal programs with an average reach of 40 million people. Combinations of Oracle's data warehousing, BI, and other tools are used by the Netherlands, Belgium, and other countries to support better program implementation and administration. The Dutch take this a step further and use Oracle Policy Automation in conjunction

with Oracle Business Intelligence to perform not just analysis of existing programs but modeling and projection of outcomes for proposed policies.

In April 2009, the Chinese Government announced its intention to reform healthcare, and ensure equitable access to essential services for millions of Chinese. Over the first three years of the plan, more than 60% of healthcare costs will be borne by provincial and local governments. Many of the provinces in China are working with Oracle to stretch their funds. In the province of Shenyang, the **Shenyang Healthcare Funding Management Center** is using Oracle Business Intelligence to ensure accurate distribution of healthcare funds and, as a result they expect to:

- Install a faster, more powerful healthcare funding management system that gives real-time access to user-friendly data reports
- Implement a solution that supports informed decision-making around the provision of insurance, as the organization's existing data management system did not offer this capability
- Ensure the organization can implement and support the Chinese government's healthcare reforms

Similar efforts based on Oracle platforms are taking place not just in other provinces in China such as **Heibe**i (a smaller province with 60 million residents), but also in many of the Provinces in Canada.

Integration and Infrastructure Modernization

The HIX platform construction as envisioned by the PPACA focuses on the consumer facing portal as the key driver to modernization and this similar to what we've seen from many health and human services programs around the world. For example, the **Housing Finance and Development Center of Finland (ARA)**, responsible for implementation of social housing policy and State financing of subsidized rental housing, made the transition from manual paper-based workflow using Oracle's WebCenter Suite portal environment backed by Oracle SOA Suite for back end systems integration. Similar to HIX, ARA has to work with external private firms – instead of insurance providers they deal with large construction firms – but there are IT parallels in terms of process handling including oversight and certification of their limited set of private sector partners. UWV, referenced above, also has to work with a set of private sector partners, job training firms to support retraining the unemployed and employers for those placed in jobs.

Aside from Oracle Portal, UWV also found that modernization of their underlying content management system was also a critical element of their efforts. Oracle Enterprise Content Management also is helping UWV to improve the stability and scalability of the werk.nl site. In addition, it helps UWV to identify more affordable approaches to IT management and streamline information flow to the Web in a scalable and manageable way.

In order to avoid large surges in identity fraud yet avoid bureaucratic paper-based or face-to-face process, on-line secure, role-based identity management will be critical. Many of the programs ranging from a National ID program focused on social services programs with the **Ministry of Labor and Social Services (MOLSS)**, People's Republic of China, to very specific local government programs like **Hong Kong's Housing Association** (the Hong Kong Public Housing management department), have implemented identity management for front-end users that takes a SOA approach to

authentication and fine-grained authorization of services (application and data components) associated with the users.

Integration of the front-end HIX platform to back-end financial systems will be important in many instances. The SSA, referenced above, implemented Oracle SOA Suite to establish real-time integration between the agency's financial applications and various third-party applications with Web services which, in turn, automates key processes including travel requests and purchase card transaction verification and provides users with a near real-time view of spending, significantly reducing the delays that previously existed and enabling users to make better budget decisions.

Conclusions

The Window is Short and the Stakes are High

The PPACA is the law of the land and the time to implement it is now. With the tightly coupled constraints of federal funding, timelines and architectural guidance, only a solution based on COTS that is open and integratable can fully meet the challenges States face. Furthermore, the law and the expectations of consumers will dictate a modern platform, exhibiting functionality typically found in the call centers and self-service portals of the FEDEX, UnitedHealthcare, Amazon.com's of the world. What is not directly stated is that to achieve many of the improved outcomes and cost savings required to justify this ambitious undertaking, the platform must be stood up in such a way that it can be rapidly, inexpensively and flexibly extended to support everything from income to familial to medical assistance programs enrollment and management functionally based on the initial architectural design and implementation. Equally important, it must be able to scale down in cost and consumer traffic from the larger States like California and New York down to the smaller States like Wyoming and Vermont. Let us recap some of the hurdles and unknowns that will inject risk into these projects:

- Potential for unrealistic timelines relative to historical performance on many existing legacy project integrations and upgrades – can you afford for delays to transfer a significantly higher percentage of the funding burden from the federal government to your State?
- Potential for unworkable reference architectures - can you take a system that was developed by a State with 20 million plus residents and deal with the complexity and scale associated with its former, larger State implementation?
- IT platforms currently tailored to specific siloed programs based on guidelines and mindsets that may be radically different from those of both your non-IT government stakeholders or a new set of constituents, for example:
 - You may need to market your program and drive to increase program roles – is your current Medicaid or Unemployment platform focused on this?
 - You may need to build in novel social network or add mobile connectivity to your platform – does the vast majority of your Medicaid program base fit into a demographic that uses these tools?
 - You may need to extend your platform to other programs that you currently are not mandated to integrate at this time, for example, you may need to leverage unemployment to understand or

potentially justify outcomes for your HIX program – can you build a golden record system behind a consolidated case management system that handles multiple formats of proprietary data from several health and human services programs today?

These are just a few examples of uncertainties surrounding how your IT decisions can impact your HIX platform and overall mission agility. In a high-stakes endeavor as complex as standing up a fully functioning State-wide HIX platform by 2014 one must always look to minimize risk on several fronts:

- Select a platform where as many of the components are fully integrated yet open and extensible without the need to involve your systems integrators or internal IT developers, for example leverage pre-integrated systems for as many of the systems within the three tier architecture described above (for example, systems like Exadata and ExaLogic)
- Avoid programmatic code development – or even just upgrades to existing code where possible, particularly in the following areas:
 - Policy and rules modeling and automation
 - Business and operational process modeling and orchestration
 - Integration of back-end services – avoid point to point connections with either legacy systems or new services offered by the Federal government for identity and income verification
- Select your systems integration partners carefully based on their willingness to work with your solutions modules vendors and adhere to the following model:
 - Integrate at the highest possible module level feasible – don't write your own code if a COTS middleware can be used and don't use a middleware component if a COTS Application can be used
 - Reuse any legacy components that can be service enabled yet integrated with a modern platform but is able to meet your long-term cross-program integration goals
 - Willingness to be part of an IT steering committee inclusive of all key IT and business decision makers encompassing your IT products vendors, SI subcontractors, and any other 3rd parties you may bring in (analysts, academicians, etc.)
- Avoid making the core platform for the HIX any legacy Medicaid or other existing transfer system that is more than 10 or 15 years old (clearly it needs to be leveraged as the back end for execution of existing Medicaid benefits disbursement and other core functions going forward but not integrated eligibility and intake, cross program data collection, analysis, and other go-forward central platform functions).

Oracle Provides the Fastest Time to Value with Less Risk

Oracle can provide you with a complete HIX platform solution that can support all health and human service programs and core business functions such as eligibility, case management, policy determination, financial management, etc. Oracle is the only vendor that has a comprehensive integrated solution that includes all the necessary hardware, software, and even On Demand services

from a single vendor. Our componentized solution allows customers to implement in a modular fashion with an approach that best suits them. We do not advocate “Rip and Replace” of large parts of legacy systems, which increases overall program risk nor are we obligated to support costly forced reuse of systems that may be ill-suited to new requirements like those of an HIX. HIX designers can start a modernization project where it makes sense for them and implement our solution in a very flexible process, using the best of their existing platforms in the most reasonable fashion. Our open SOA architecture ensures interoperability to external and legacy systems. Additionally, almost every component of our solution is highly rated by Gartner and Forrester ensuring that our customers are implementing solutions that are the best-in-class and can be leveraged not only in health and human services but across an entire State Enterprise.

Oracle provides the best Return on Investment for the implementation of State-level HIX platforms, by using a proven Enterprise Architecture and the ability to use On Demand hosting which will help ensure the successful implementation of an HIX by the 2014 deadline. Our proven solution is architected to be highly configurable so it can meet the demands of our customers today and far into the future thus providing a much lower total cost of ownership than other competing solutions. This architecture also provides a very flexible solution that can allow our customers to configure the solution to the needs of their business model. Oracle has a patented upgrade technology which means upgrades are possible without re-implementation. This patented technology is vital to the long term commitment that Oracle has to its customers and provides the best investment protection to our customers. For example, with over 5 million deployed users worldwide on our Siebel case management platform, Oracle is the most proven solution in the industry.

Oracle is a very solid, financially stable company with annual revenues in excess of \$35.6 billion and a Research and Development budget of \$4.5 billion. Oracle has a long commitment to the Healthcare market around the world, supporting some of the largest Public healthcare administration programs such as the National Health Service in the United Kingdom as well as solutions for 8 of the top 10 Commercial Health Insurers in the United States. This ensures that our customers are making a safe investment acquiring Oracle solutions now and far into the future. Oracle has the best network of System Integration partners with a large ecosystem of certified, trained professionals that can assist our customers with initial implementation and ongoing support and maintenance. The combination of our stability, long-term commitment to this market, an extremely broad range of products and solutions, and our extensive partner network, allows additional health and social services platform functionality to be phased in as requirements change, business rules solidify, or legislation dictates new programs or consolidations to existing ones.

In summary, Oracle is on the cutting edge of cross health and human services program integration around the world as demonstrated by the work described above in the Best Practices section of this white paper. Based on these experiences with programs around the world and our early entry on several fronts in healthcare reform, Oracle can provide a leading edge HIX solution that is complete, open and integratable into your existing State-wide health and human services programs, with the fastest time to value and less risk.

Additional Resources

- The Office of the National Coordinator for Health Information Technology (http://healthit.hhs.gov/portal/server.pt/community/healthit_hhs_gov_regulations_and_guidance/1496)
- The Center for Consumer Information & Insurance Oversight, CCIIO, a division of CMS (<http://cciio.cms.gov/index.html>)
- Healthcare.gov, the US Federal consumer facing information portal (<http://www.healthcare.gov/>)
- The Henry J. Kaiser Family Foundation's Healthcare Reform consumer facing information portal (<http://healthreform.kff.org/>)
- The Henry J. Kaiser Family Foundation's State Health Facts information portal (<http://www.Statehealthfacts.org/>)
- The HealthcareAndYou.org consortium comprised of key advocacy groups including AARP, the American Medical Association, the American College of Physicians, the American Heart Association and other nationally recognized organizations (<http://www.healthcareandyou.org/>)
- The National Academy for State Health Policy information portal (www.nashp.org)
- National Conferences of State Legislatures Health Reform Implementation page (<http://www.ncsl.org/Default.aspx?TabID=160&tabs=831,139,1156#1156>)



Getting Ready for 2014:
Oracle's Best Practices for Integrating Health
Reform and Human Services Initiatives
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